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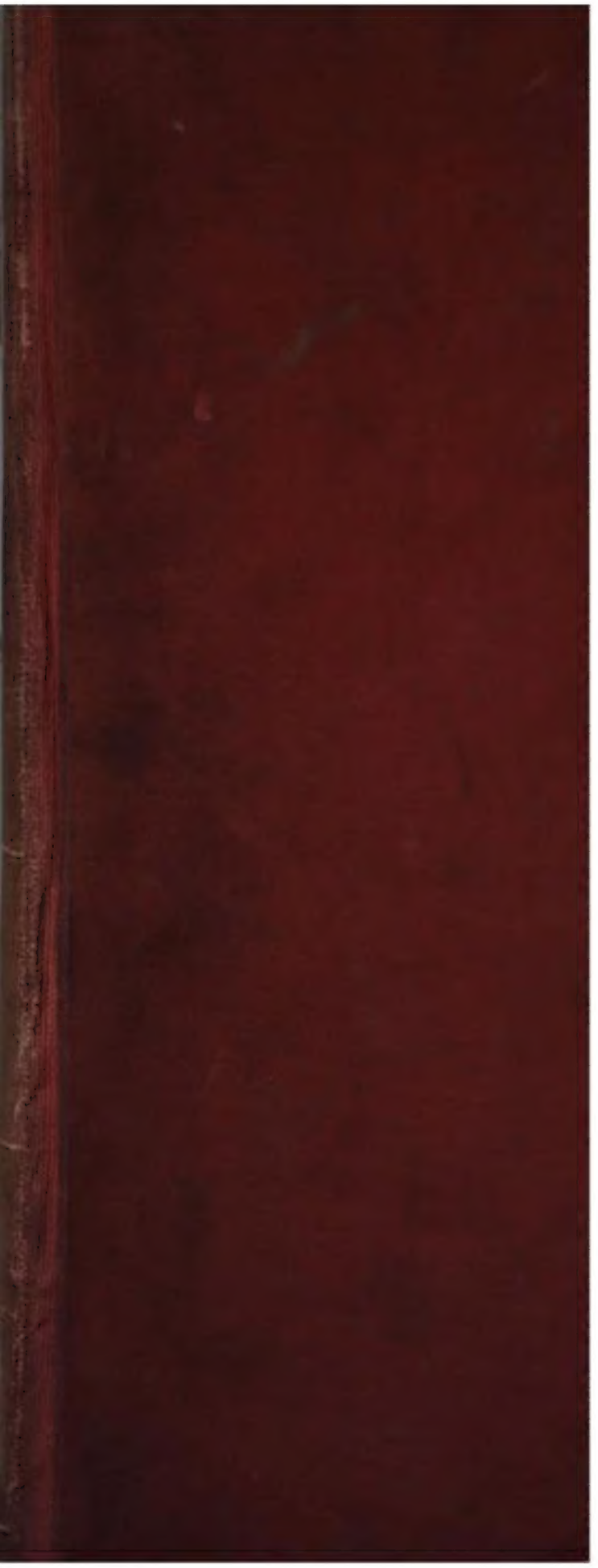
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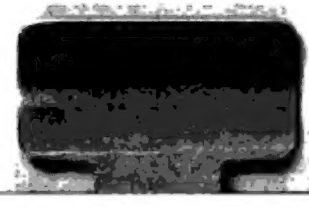


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THE "BEFORE SHOWS" ISSUE OF

549837

MOTOR WORLD

Vol. XXXIV
No. 1

New York, December 26, 1912

Ten cents a copy
Two dollars a year

TO MOTOR WORLD READERS:

Fore-knowledge is the knowledge worth while. It permits things to be seen in the light of today—not in the shadows of yesterday. It permits both intelligent planning and intelligent execution. It is the basic reason for this Advance Show Information Number.

It has long seemed that what show-goers most desire is information regarding what they *will see*, not what they *have seen*, and MOTOR WORLD has made a faithful effort to serve that purpose. Not all of the intending exhibitors have extended that co-operation which reasonably was to have been expected and where information is lacking, it is due to that cause alone. We ourselves exhausted every resource to obtain it.

It is issued sufficiently far in advance of the opening of the first of the National Shows to give to the dealer fore-knowledge that will truly light his way and assist his study of exhibits and facilitate his plannings and their consummation.

The new things, the improvements—the changes made by manufacturers—and the prices—and more than all else, the selling features of the respective wares are presented as they never have been presented before.

THE PUBLISHERS.

Through the courtesy of Gray & Davis, who are scheduled to appear as advertisers on this page, we are permitted to lead off addressing our readers. The four-page announcement of this firm will be found on pages 177, 178, 179, 180.

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Finished in Black, Brass or Nickel. Made in four sizes with special type for Ford cars and Underslung cars.

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Traffic policemen, by the hundreds, interviewed in all the large cities throughout the country, express the unanimous opinion that their work would be greatly reduced; that nearly all **skidding accidents would be eliminated** if motorists would take the precaution of always carrying WEED CHAINS, and putting them on when the roads and pavements are wet, slippery and uncertain, or covered with snow.

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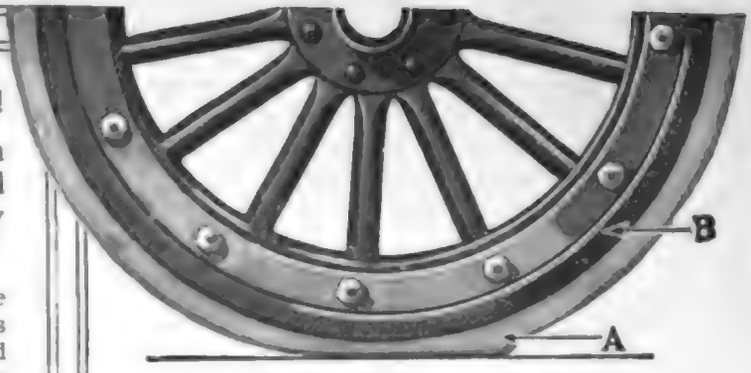
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STUDY the illustrations! They show how you can double the efficiency and profit of your heavy service truck.

The upper cut shows the "traction" wave always formed in the ordinary continuous tire under heavy load This wave, caused by the bulging of the rubber, works into the base and tears the tire from its fastenings. It can't be avoided in any ordinary way. Then, too, this wave forms a constant hill—the tire is always climbing, retarding progress, reducing power efficiency.



Showing traction wave in ordinary continuous tire. (A) indicates where wave forms. (B) indicates base where roll and tread separation occur.

Contrast this condition with the profit-making worth of—

Firestone

Continuous Base—Notched Tread

Truck Tires

The lower cut shows how the Firestone Notched Tread overcomes the wave, by preventing its formation. This is *not* an individual block tire, with tread-tearing, metal-retaining plates. The Firestone continuous base is of the same tough, resilient compound as the tread. These tires hold the road, increase traction, absorb all vibration.

Get the full facts. They mean Economy and Increased Profits.

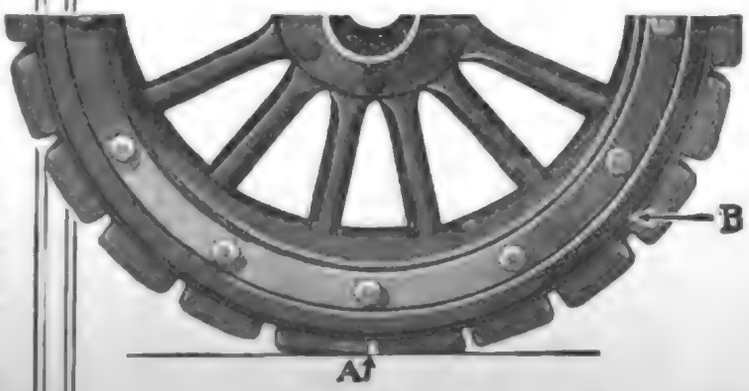
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Showing how Firestone Notched Tires overcome destructive traction wave. (A) indicates wave passing off into space between blocks. (B) indicates continuous base—assuring absorption of vibration in every direction.

MOTOR WORLD

Vol. XXXIV New York, U. S. A., Tuesday, December 26, 1912 No. 1

THE NEW YORK PUBLIC LIBRARY

RECEIVERSHIP FOR MATHESON TO ASSIST REORGANIZATION

Financial Stringency Leads to Action by Creditors—Second Time in Two Years—President is Made Receiver.

With the consent of its creditors, and as a means of relieving its financial stringency and of permitting reorganization, the Matheson Automobile Co. of Wilkes-Barre, Pa., was placed in the hands of a receiver on Friday, 20th inst. Its president, W. C. [illegible] was named by the court to serve in that capacity. It is the second time he has acted in that role for the company, two years ago, when it became financially embarrassed, he was named receiver and shortly took such a liking to the business that, when it was reorganized and [illegible] by the court, he became its president.

For a period of three months the Matheson company has been feeling the pinch and has been entering into the considerations of many plans. It was first thought possible to reorganize the company by bringing about a readjustment of stocks and bonds in exchange for new stock, about 80 per cent. of the stockholders and 60 per cent. of the creditors being agreeable to the plan; but this would have required considerable capital, and as not all of the stockholders and creditors displayed a friendly disposition, the plan was abandoned. Accordingly, at a meeting of the creditors on Thursday last it was deemed for the best interests of all that a receiver be appointed, which action was taken on the petition of the Bosch Magneto Co.

A committee of three also was chosen to act with the receiver in his efforts to straighten out the Matheson affairs; it is composed of G. Jahn, treasurer of the Bosch Magneto Co., who also acted as chairman of the creditors' committee; E. S. Fretz, president of the Light Mfg. & Foundry Co., and H. P. Jones, president of Phineas Jones & Co.

In round figures, the Matheson indebtedness is $900,000, apart from its outstanding capital stock of $2,500,000; its estimated assets are in excess of $1,000,000.

Mead Engine Men Enter Speedwell.

Several men identified with the Mead Engine Co. of Dayton, O., which manufactures a rotary valve engine, have acquired an interest in the Speedwell Motor Car Co., of that city, which, it is stated, probably will utilize the Mead engine, at least to a certain extent. As a result of the transaction, Adam Schantz, of Dayton, and George Solingen, of Hamilton, O., will become directors of the Speedwell company. P. D. Schenck, president of the latter, who also is the head of the Dayton Malleable Iron Co., is understood to be desirous of devoting more time to the latter interests.

Sparks-Withington Takes up Horns.

Although it already has produced 7,000 of them, the Sparks-Withington Co. of Jackson, Mich. just has made public the fact that it formally has taken up the manufacture of electric horns. Heretofore it has confined itself chiefly to engine fans. Derived from portions of the company name, the Sparks-Withington horn is styled "Sparton." It is of the motor driven type, made in both dash and under-the-hood patterns. It is offered as the "first electric horn of real quality and efficiency sold at a quantity price," viz., $9, $12 and $15.

Pope to Secure Massachusetts Charter.

To carry out a move which it is known has been in contemplation for several months, the directors of the Pope Mfg. Co., of Hartford, have voted to take out "papers" as a Massachusetts corporation, in which state the chief ownership lies. The Connecticut charter, of course, will be surrendered, and the stockholders will be offered the privilege of exchanging their Connecticut stock for shares in the Massachusetts company on a share for share basis.

STEWART BUYS WARNER AND BIG CORPORATION RESULTS

Two Companies Combine with $11,000,000 Capital, but Will Market Speedometers Separately—Patents a Factor in Deal.

After a succession of small rumors, each of which was put to rout by the persistency with which pending patent litigation was pressed, the Stewart and Warner speedometer interests finally have become one, under the style Stewart-Warner Speedometer Corporation, which has been incorporated under the laws of Virginia with an authorized capital of $11,000,000.

The transaction is practically in the nature of a purchase of the Warner Instrument Co. of Beloit, Wis., by the Stewart & Clark Mfg. Co., of Chicago, and no secret is made of the fact that the merit of certain of the Warner patents covering the magnetic principle as applied to speedometers largely influenced the deal.

Specifically, the new corporation acquired not only the business of the two companies involved, but the patents owned by J. K. Stewart, of Chicago, and A. P. and C. H. Warner, of Beloit, which it believes places it in position to dominate the production of speedometers utilizing the magnetic principle.

Stewart, who is the present head of the Stewart & Clark Mfg. Co., will become head of the Stewart-Warner Speedometer Corporation, and C. B. Smith, also of the Stewart establishment, will be made secretary and treasurer. The vice-president and the directors have not yet been selected. It is officially stated, however, that the organization and management of both the Chicago and Beloit plants will remain unchanged and that the productions of each factory will be handled separately.

It is understood that the Warner brothers probably will retire from active participation in the business. Some time since they

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acquired a gold mine in Mexico in which pay dirt was struck after a long period of discouragement, during which stock freely was offered with few takers. They now are said to be deriving more than handsome income from that source. They also are credited with having netted between $1,750,000 and $2,000,000 from the sale of their speedometer interests to the new Stewart-Warner Speedometer Corporation, but none of those in position to speak with authority will either confirm or deny these figures.

Of the capital stock of the Stewart-Warner Speedometer Corporation, $1,000,000 is represented by 7 per cent. cumulative preferred shares, redeemable at 110, and the remaining $10,000,000 by common stock. White, Weld & Co., bankers, of New York and Chicago, who financed the enterprise, will acquire all of the capital stock and a block of the common, at least some of which, in due course, will be offered to the investing public.

The new turn of affairs, of course, will terminate the suit for infringement which for more than two years has been pending in the Federal court in New York and which was brought by the Warner company against the Stewart & Clark company; it involves patent No. 823,237, and the case, as Motor World stated last week, is about due for retrial, the retrial being made necessary by the illness of the judge who first heard the case and whose disability is such as to make it impossible for him to render a decision.

Crescent Company to Continue Ohio Car.

The Northway interests, which recently purchased the plant and other assets of the bankrupt Ohio Motor Car Co., of Cincinnati, will continue the manufacture of the Ohio car under the style Crescent Motor Co., of which R. E. Northway is president The Northway Motor Co. itself will produce engines for the trade in a portion of the former Ohio plant.

Peerless Adds $7,000,000 to Capital.

The Peerless Motor Car Co., of Cleveland, O., has filed notice of an increase in its capital stock from $3,000,000 to $10,000,000. Men already identified with the company recently largely increased their holdings, and the increase of capital is designed to carry out plans which they have in view.

Broadway Store to Change its Name.

Through Sidney Whittemore, its president, the Broadway Auto Accessories Store, Inc., of New York, has applied to the courts for authority to change its name to Whittemore-Sim Co., Inc. The change will be made early next month.

ZENITH CARBURETTER TAKEN INTO COURT BY STROMBERG

Chicago Maker Alleges Foreign Device Is an Infringement—Two Little Known Patents Brought to Bear.

Bringing to bear two little known patents, the Stromberg Motor Devices Co., of Chicago, has brought suit in the Federal court in Detroit against the Zenith Carburetter Co., of Detroit, which patents, of course, are claimed to be infringed by the Zenith instrument. The latter is of foreign origin, where it has attained a wide popularity. The American company was formed only about a year ago and gradually has been attaining headway.

The patents involved are one granted to G. V. Ahara in 1901 and the other issued in 1905 to E. C. Richard. The former patent describes what broadly is claimed to cover a carburetter producing a proper mixture of fuel and air automatically and without moving parts for all speeds.

The Richard patent covers a specific feature of construction claimed to be necessary to any "plain tube" carburetter; it describes a "U-shaped tube extending into the mixing chamber, the other end being exposed to atmosphere, combined with other features found in all modern carburetters." The Ahara patent is No. 684,662 and the Richard No. 791,501.

Ends Interference With Mercedes Owners.

Prosecution of Mercedes owners in America by the Daimler Mfg. Co., the American manufacturing licensee of the Daimler Motoren Gesellshaft, of Untertuerkheim, Germany was ended Monday last, 23rd inst., after a short period during which the American Daimler company had caused considerable ill feeling among owners by its efforts to exact a license fee from the possessors of the German cars which they themselves imported. When the parent company, in the Supreme Court for New York county, asked a permanent injunction preventing this demanding of fees, the American Daimler saw a light and consented that a temporary injunction be issued to the applicants.

This restrains the American Daimler from carrying on its license prosecutions during the pendency of the suit, and the representatives of the German company state that the American concern has agreed to submit to a permanent injunction, also, which will leave the owners free from molestation. The complaint of the parent corporation was based upon a clause in an importing contract which provided that American Mercedes owners who had made bona fide purchases were not to be molested and that if the American Daimler believed it had any cause for complaint it should take up such matters with the German company.

Referee Refuses to Confirm Lion Sale.

At a receiver's sale of the assets of the Lion Motor Car Co., of Adrian, Mich., on Friday last, the property was bid in by A. O. Dunk, of the Autoparts Mfg. Co., of Detroit, for $7,000. The referee in bankruptcy, however, refused to confirm the sale, considering the price insufficient, the property having been appraised at $32,000. Accordingly it was again offered for sale on Tuesday, when Samuel L. Wintermitz, of Chicago, tendered a bid of $12,250. The referee, however, withheld confirmation for one week, and has let it be known that no bid of less than $12,750 will be confirmed. It is stated that citizens of Adrian are so anxious to revive the Lion business that they will assure a bid of that amount, and also give a bonus of $10,000 to the purchaser provided he agrees to continue the business in their city.

Schrader Stops Another Gauge Maker.

On Wednesday, 18th inst., Judge Humphreys, in the United States District Court in Chicago, granted the preliminary injunction prayed for by A. Schrader's Son, Inc., of New York, against E. Edelmann & Co., of Chicago, restraining them from manufacturing, selling or in any way infringing the Twitchell tire gauge patent which is owned by Schrader's Son. The Schrader allegation, of course, is that the Edelmann "Economy" gauge infringes the Twitchell patent, No. 927,298, which is claimed to cover all pencil types of tire pressure gauges. In the Federal court circuit in New York, the New York Sporting Goods Co. already had been enjoined from selling the Edelmann.

Cartercar Establishes Southern Branch.

The Cartercar Co. of Pontiac, Mich., has established a depot at 242-244 Peachtree street, Atlanta, Ga., which will be in the nature of a Southern branch. It will control and supply all Cartercar agents in the South. It will be in charge of W. C. Mahoney, who for many years represented the Cartercar interests in the South.

Gibneys to Assume Company Title.

James L. Gibney & Bro., of New York, who market the Gibney solid tires and Elec-Trick vulcanizers, have applied to the Supreme Court for permission to change their name to Gibney Tire & Rubber Co., Inc. The personnel of the company, however, will remain unchanged.

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EXPORT OF AMERICAN CARS SHOWS 69% GAIN IN OCTOBER

Surpasses Shipments of Year Ago by Good Margin—British Territory Lessens its Purchases—American Possessions Increase.

While it is possible, but not probable, that the British protest against the so-called invasion by American cars may be in some measure responsible for a falling off in shipments of cars from the United States to England and some of her possessions during October last, this retrogression in exports was more than made up in other quarters and, as a result, October, 1912, surpasses October, 1911, by 69 per cent. in number and 52 per cent. in valuation. Their respective gains were 660 cars and $540,719; the exports of October, 1911, were 952 cars valued at $1,043,093, and those of October last 1,612 cars with a valuation of $1,583,812.

It has been the case for many months past Canada showed the greatest gain of any of the twelve geographic divisions into which the Federal statistics divide the world for export enumeration, its purchases of cars in October last being greater in number by 212 and the valuation showing 52% better than in October, 1911. While with a gain of 110 per cent. in number and 77 per cent. in valuation, Germany was next on the percentage basis, its imports of October last increasing by 800 per cent. in number and 690 per cent. in valuation; this gain represents 40 cars and $39,688.

The United Kingdom came precariously close to being registered in the loss column both in number and valuation, but while its takings of American cars in the last October were 52 greater in number, a gain of 24 per cent., the valuation side of the table shows a decrease of $17,531, a loss of 7 per cent. This is accounted for by the fact that the average value of cars shipped to the United Kingdom in October, 1911, was $1,113, while in October, 1912, it fell to $828.

At the same time British Oceania territory showed a loss of $18,320, or 7 per cent., in value, and, with a gain of but 2 cars, or .7 per cent., nearly registered a decrease in number of cars taken. The only division which lost in number and value was Mexico, whose buying of American cars fell off 6, or 26 per cent., in number and $8,861, or 23 per cent., in value.

In percentage of gain in number Germany is followed in order by Other Countries, Asia and Other Oceania, Italy and France, and in the value percentage table by Asia and Other Oceania, Other Countries, Italy and South America.

Automobile parts, exclusive of engines and tires, to the value of $328,700, were exported in October, 1912, which is a gain of $15,409, or 5 per cent., over the $313,291 which the October, 1911, shipments cost the purchasers. The total value of cars sent to foreign countries for the first ten months of the present year, $19,836,111, showed better by $7,227,984, or 57 per cent., than $12,608,127, the figure for the same period of the preceding year.

Non-contiguous possessions of the United States received cars and parts to the amount of $211,267 in October last and $124,131 in the same month of 1911, an increase of $87,136, or 70 per cent. For the same periods the latter gained in number of cars by 92 or 142 per cent. Although Hawaii, with 42 more cars, leads in numerical gain in number of cars taken, the Philippines, with 39 more cars, forged upward by 1300 per cent. and by 1085 per cent., or $42,921, in the increased total valuation of its product. The order of the four possessions in number of cars taken is Hawaii, Philippines, Porto Rico and Alaska.

Alaska showed a loss, but the figures are not significant, since it dropped from two cars to one. The average values of cars shipped to these possessions for Octobers of 1911 and 1912 were, respectively: Hawaii, $1,860, $1,358; Porto Rico, $1,550, $1,062; the Philippines, $1,315, $1,113; Alaska, 805, $1,100. The figures in detail are shown by the subjoined table.

Veneer Makers Purchase Paterson Plant.

The New Jersey Veneer Co. has purchased the former Cardinal silk mill on East Railway avenue, in Paterson, N. J., in which city it will establish itself. The company produces high grade door panels and veneer for automobile use.

Articles—Exported to—	October 1911 Quantities	October 1911 Values	October 1912 Quantities	October 1912 Values	Ten Months Ending October 1910 Quantities	Ten Months Ending October 1910 Values	Ten Months Ending October 1911 Quantities	Ten Months Ending October 1911 Values	Ten Months Ending October 1912 Quantities	Ten Months Ending October 1912 Values
France	14	$19,582	42	$24,820	207	$637,734	300	$413,030	585	$439,313
Germany	5	5,744	45	45,432	102	297,168	95	112,126	392	316,201
Italy	6	3,782	13	9,785	106	347,652	167	192,339	254	224,436
United Kingdom	213	237,109	265	219,578	1,270	2,263,375	2,776	2,407,373	4,207	3,163,096
Other Europe	52	33,892	62	54,103	379	603,077	685	635,378	1,340	1,098,761
Canada	193	277,624	405	491,133	3,205	3,322,310	4,300	4,770,911	6,393	7,704,772
Mexico	23	39,580	17	30,719	291	531,398	210	351,007	198	320,592
West Indies and Bermuda	23	21,195	35	32,418	183	280,468	236	270,994	273	283,116
South America	102	100,066	191	202,610	272	302,787	766	967,358	1,586	1,817,988
British Oceania	262	248,985	264	230,665	507	377,530	1,729	1,602,383	2,849	2,586,165
Asia and other Oceania	42	35,262	186	167,072	248	300,405	645	647,097	1,321	1,310,323
Other countries	17	20,272	87	75,477	241	257,947	221	238,161	620	570,728
Total	952	$1,043,093	1,612	$1,583,812	7,011	$9,521,851	12,196	$12,608,127	20,018	$19,836,111
Parts of (except engines and tires)	.....	313,291	.....	328,700	.....	1,669,787	.....	2,736,550	.....	3,936,110
Total automobiles, and parts of	952	$1,356,384	1,612	$1,912,512	7,011	$11,191,638	12,196	$15,344,677	20,018	$23,772,221
To American Possessions—										
Hawaii—										
Cars	39	72,570	81	110,060	320	625,451	280	547,078	504	792,421
Parts	.....	5,218	.....	8,377	.....	49,488	.....	75,073	.....	61,018
Porto Rico—										
Cars	21	32,510	33	35,035	147	268,311	217	424,526	346	490,647
Parts	.....	7,543	.....	8,598	.....	83,875	.....	71,087	.....	99,150
Philippines—										
Cars	3	3,945	42	46,766	180	226,648	228	298,450	412	533,111
Parts	.....	503	.....	1,237	.....	40,523	.....	41,962	.....	48,461
Alaska—										
Cars	2	1,610	1	1,100	3	4,350	7	6,060	14	19,164
Parts	.....	232	.....	94	.....	2,308	.....	2,159	.....	3,956
Total	65	$124,131	157	$211,267	650	$1,300,954	732	$1,466,395	1,276	$2,047,928
Grand Total	1,017	$1,480,515	1,769	$2,123,779	7,661	$12,492,592	12,928	$16,811,072	21,294	$25,820,149

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FRANCE FIGURES LARGELY IN OCTOBER IMPORT RECORD

Of 78 Cars Brought into United States, 51 Came from French Makers—Month, Nevertheless, Shows a Decrease.

October was not one of the noteworthy months in the matter of automobile imports, the total number of new cars brought in being 24 per cent. less in number than in October of 1911 and 13 per cent. less in value. The comparative figures are: October, 1911, 103 cars, valued at $207,059; October, 1912, 78 cars, $170,410, a loss of 25 in number and $26,649.

The standing of France, however, is interesting; in October, 1911, she sent 35 cars to America, which was 34 per cent. of the entire importations, but in October last her American shipments had risen to 51, a gain of 45 per cent. and the number being 65 per cent. of the whole.

At the same time all other countries lost heavily. For the first ten months of 1911, 773 cars valued at $1,657,281 were imported; for October, 1912, these statistics were 694 cars at $1,573,584, losses of 24 per cent. in number and 13 per cent. in value. The parts imported kept pace with the cars in the falling off, and from a valuation of $31,398 in October, 1911, the figure dropped to $18,528 for the same month a year later, a monetary loss of $12,870, or 40 per cent. The first ten months of 1911 and 1912 were responsible for respective imports of $206,992 and $241,262, a decrease of 10 per cent. The comparative October imports were:

	October, 1911.		October, 1912.	
France	35	$67,896	51	$105,754
Germany	16	34,738	1	762
Italy	15	23,449	7	13,324
Gmr. King.....	22	54,054	8	24,318
Osh. countries.	15	26,922	11	26,252
Total cars..	103	$207,059	78	$170,410
Parts (except tires)		31,398	..	18,528
Total	103	$238,457	78	$188,938

To Exploit Multiple Drive Wheel Vehicle.

The American Motor Traffic Co., incorporated under the laws of South Dakota, has established an office in the Citizens' Bank building in Washington, D. C., where it proposes to exploit several automobile inventions, in particular, a pivoted spindle, multiple-wheel drive and steer truck, under what are described as the McFarren and Thomas patents. The officers of the company are E. S. Alvord, president Litttlefield & Alvord Express Co., president; S. J. McFarren, manager The Searching Co., first vice-president and acting manager; W. J. Moore, president The Moore Co., second vice-president; A. L. Kley, of New York City, secretary. These officers, with J. C. Muncaster, of Washington, and J. C. Menoher, of Pittsburgh, constitute the board of directors.

Buffalo Electric Acquires More Property.

The Buffalo Electric Vehicle Co. has absorbed the Buffalo Motor Vehicle Service Co. and taken over the latter's service station at 178 West Utica street, which immediately adjoins the Buffalo factory. As a result of the transaction, W. R. Huntley, assistant general manager of the Buffalo General Electric Co., and Robert W. Searle, vice-president of the Rochester Railway & Light Co.—both of which companies were affiliated with the Buffalo Motor Vehicle Service Co.—have been added to the board of directors of the Buffalo Electric Vehicle Co. Incidentally, the Empire State General Vehicle Co., which is closely affiliated with the Rochester Railway & Light Co., has taken the agency for both Buffalo cars and trucks. The Empire State company maintains and operates what many consider the finest garage and service station in Rochester.

Dead Windshield Company Loses Suit.

The Windshield Mfg. Co., a New Jersey corporation which went out of business since the action was filed, was unsuccessful in a suit again the Erie & Western Transportation Co. in New York City Court, the complaint being dismissed when the case was reached last week. The loss in transit of part of a carload of windshields consigned to the Reo Motor Car Co., at Lansing, Mich., in 1910 was the basis of a claim for between $500 and $600, the windshield makers claiming that the Erie company, which was one of three carriers to convey the shipment from New York City, was the one which lost the goods. The Erie company set up as a defense that it delivered the shipment to the next carrier in the link and was in no way liable and, taking other phases of railroad law into consideration, the judge ordered the suit out of court.

N. A. A. M. Opens an Office in Detroit.

In line with its policy of attempting not merely to further the interests of its members but to relieve the freight car shortage which threatens direful results, the National Association of Automobile Manufacturers has established an office in the Ford building in Detroit. It is in charge of L. A. Gardner, who previously was connected with the traffic department of the United States Motor Co. He, of course, will be subject to the direction of J. S. Marvin, general traffic manager of the association.

"35%" BEATEN IN LAWSUIT ON ADVERTISING CONTRACT

Jury Decided that Pedal Maker Correctly Interpreted "Famous" Agreement—Gets Full Amount and Interest, Too.

While it is not unusual for the 35% Automobile Supply Co., of New York City, to be involved in litigation, it is not common for the opposing party in the law actions to consider himself victorious when the matter at issue is based upon one of the "35 per center's" now famous advertising contracts wherein various manufacturers were accorded the privilege of handing the "35%" about $3,000 worth of goods in exchange for advertising; but the 35% was beaten Tuesday last, 24th inst., in the New York City Court and was directed by the jury to pay to the assignee of the now bankrupt American Pedal Co., $1,050.

The suit was similar to several others, in which the cut-rate supply company has been involved, and one of its advertising contracts was the beginning of the action. The Pedal company, in the latter part of 1910, made a contract with the 35% company which specified that the Pedal company was to pay to the 35% the sum of $2,800, with the option of making payment in merchandise, and in exchange the Pedal company's goods were to be advertised or illustrated in the 35% catalog, circular or whatever its classification may be.

The advertising was to be inserted monthly between and including January and October, 1911. But it was not long before a usual difference of opinion arose. The Pedal company shipped a bill of goods to the value of $965 and claimed it was extraneous to the contract and should be paid for, while the 35% claim was that it came within the contract and should not be paid for in money. The suit was to recover the $965 with interest. The defendants set up a counterclaim of $1,275 for goods not sent because the Pedal company broke off its agreement, but the jury found for the complainant.

The action was not brought by the Pedal company but by the Personalty Liquidating Co., to which Carleton S. Cooke, the trustee in bankruptcy for the Pedal company, has set over the claim.

Toledo Truck Acquires New Factory.

The Toledo Motor Truck Co., of Toledo, O., which manufactures the truck of that name, has acquired the plant on Spencer street which previously was occupied by the McCreery Engineering Co. It affords about 25,000 square feet of floor space.

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The Week's Incorporations

[illegible] Mass.—Dyson, Walsh & Nich[illegible] under Massachusetts laws; to [illegible] motor cars.

[illegible] Ohio—Bedford Supply Co., un[illegible] laws, authorized capital, $10,000; [illegible] motor car accessories.

[illegible] Springs, Colo. — Colorado [illegible] & Taxicab Co., under Col[illegible] authorized capital, $20,000; to [illegible] cabs.

[illegible] Ohio—Pioneer Motor Co., [illegible] laws; authorized capital, $[illegible] motor cars. Corporators —[illegible] Woodell and others.

[illegible] N. J.—MacCarr Co., under [illegible] laws; authorized capital, $125,000; [illegible] motor cars. Corporators—[illegible] Kralulich, C. E. Fisk.

[illegible] Mo.—Waverly Sales Co., under [illegible] laws, authorized capital, $5,000; [illegible] motor vehicles. Corporators—[illegible] Stevens, Louis E. Stevens.

[illegible] Mich.—Dynamagneto Co., under [illegible] laws, authorized capital, $500,000; [illegible] motor car accessories. Corporators—[illegible] Kearney and others.

[illegible] N. J.—Geiger-Boiesz Co., under [illegible] laws; authorized capital, $100,000; [illegible] manufacture motor car devices. Corporators—A. M. Garrison and others.

[illegible] N. J.—Best Tire Co., under New [illegible] laws, authorized capital, $125,000; [illegible] manufacture motor car tires. Corporators—[illegible] Henry, M. Walker, E. Spillane.

[illegible] Mo.—T. J. Moss Motor Car [illegible] under Missouri laws; authorized capital, $[illegible], to deal in motor cars. Corporators—[illegible] Moss, J. W. Fristoe, E. J. Dykstra.

[illegible] Ind.—Premier Agency Co., under Indiana laws; authorized capital, $[illegible], to deal in motor cars. Corporators—Frank T. Day, Mary E. Day, J. Roland Lee.

[illegible] Moines, Ia.—Des Moines Motor Car Co., under Iowa laws; authorized capital, $[illegible], to deal in motor cars. Corporators—F. H. Hunter, O. F. Schee, C. L. Herring.

Detroit, Mich.—Essenkay Sales Co., under Michigan laws, authorized capital, $10,000, to deal in tire fillers. Corporators—Margaret Fellman, Ruth Fellman and others.

Pomeroy, Wash.—Union Garage Co., under Washington laws; authorized capital, $2,000; to operate a garage. Corporators—A. Halterman, E. V. Kuykendall and others.

Yaokum, Tex.—Yaokum Machine Shop & Garage, under Texas laws; authorized capital, $10,000; to operate a machine shop and garage. Corporators—[illegible] A. Orth and others.

Chicago, Ill.—Burgess-Hovey Co., under Illinois laws; authorized capital, $25,000; to manufacture car accessories. Corporators—A. Y. Sawyer, F. O. Koepke, F. W. Bigelow.

Indianapolis, Ind.—Premier Agency Co., under Indiana laws; authorized capital, $30,000; to deal in motor cars. Corporators—Victor V. Vette, David F. Sherrick, Thos. H. Adams.

Appleton, Wis.—Appleton Motor Car Co., under Wisconsin laws; authorized capital, $15,000; to deal in motor cars. Corporators—John A. Schmit, Joseph A. Krosner, John McCann.

Albany, N. Y.—Kenmore Garage Co., Inc., under New York laws; authorized capital $1,000, to operate a garage. Corporators—Michael T. Adams, George Keeler, William L. Hill.

Buffalo, N. Y.—Marcel Motor Car Co., under New York laws; authorized capital, $25,000; to deal in motor cars. Corporators—Myron B. Franklin, George B. Kline, Herman Kleinhaus.

Birmingham, Ala.—Blacklock Tire & Rubber Co., under Alabama laws; authorized capital, $3,000; to deal in motor car tires. Corporators—Kate Blacklock, Mary Bostick, H. Blacklock.

Cleveland, Ohio—Praco Mfg. Co., under Ohio laws; authorized capital, $15,000; to manufacture motor car devices. Corporators—H. G. Smith, J. C. Hipp, T. J. Smith, Tony Laness, Dan Pfahl.

Cleveland, Ohio—Oldsmobile Co., under Ohio laws; authorized capital, $50,000; to manufacture motor cars. Corporators—P. D. Metzger, C. H. Davies, J. J. Schmitt, O. L. Lampus, C. O. Nelson.

Santa Barbara, Cal.—Southern California Garage Co., under California laws; authorized capital, $20,000; to operate a garage. Corporators—Herbert W. Graft, R. E. Wheartly, Margaret Davis.

Buffalo, N. Y.—Buffalo Automobile Sales Corp., under New York laws; authorized capital, $15,000; to deal in motor cars. Corporators—William J. Harris, William U. Heverly, Maud MacDonald.

Cleveland, Ohio—Northern Ohio Motor Co., under Ohio laws; authorized capital, $25,000; to deal in motor cars. Corporators—Herbert W. Bell, L. L. Bummus, F. C. Anselm, E. P. Ulrich, C. L. Guthrie.

New York, N. Y.—Hollister Motor Co., under New York laws; authorized capital, $675,000; to deal in motor cars. Incorporators—W. H. Langford, Learned White, 1786 Broadway; H. H. Servier, 66 Broadway.

Toledo, Ohio—Toledo Sporting Goods Co., under Ohio laws; authorized capital, $10,000; to deal in motor cars. Corporators—V. D. Rivers, Charles R. Miller, R. J. Long, E. A. Bradshaw, L. J. Metzger.

Canton, Ohio—Differential Clutch Co., under Ohio laws; authorized capital, $5,000; to manufacture motor car parts. Corporators—M. R. Bissell, H. N. Nauel, H. F. Dewees, Joseph M. Lake, John T. Blake.

Detroit, Mich.—Superior Motor Co., under Michigan laws; authorized capital, $100,000; to manufacture motors and accessories. Corporators—Henry Fraser, Walter G. Schneider, Gaylord C. Brimmer.

Mineola, N. Y.—Nassau Garage, Inc., under New York laws; authorized capital, $1,000; to operate a garage. Corporators—Charles Kemlein; Frank Kemlein, Matilda Kemlein, all of 960 East 180th street, New York.

Hudson Falls, N. Y.—Kingsbury Motor Sales Co., under New York laws; authorized capital, $10,000; to deal in motor cars. Corporators—Leonard Wetsell, Albany, N. Y.; Earle H. Wells, Esther I. Wells, Argyle, N. Y.

Mount Vernon, N. Y.—Mount Vernon Motor Express & Van Co., under New York laws; authorized capital, $6,000; to operate a motor delivery. Corporators—Marion R. Fitzgibbon, Carrie C. Fitzgibbon, Samuel Laverde.

New York, N. Y.—Durable Tread and Automobile Sales Co., Inc., under New York laws; authorized capital, $10,000; to deal in motor car supplies. Corporators—Rose H. Jacobs, 605 West 112th street; Samuel M. Winkler, 524 West 34th street; Henry A. Deimel, 540 West 143rd street.

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New York, N. Y.—American Chain Co., under New York laws; authorized capital, $750,000; to manufacture automobile accessories. Corporators—Walter B. Lasher, Wm. W. Wheeler, F. T. Staples, all of Bridgeport, Conn.

New York, N. Y.—Carron & Co., under New York laws; authorized capital, $20,000; to manufacture motor car devices. Corporators—Arthur L. Carron, 141 West 136th street; Herman Behr and Karl H. Behr, 777 Madison avenue.

Brooklyn, N. Y.—Prospect Park South Garage, Inc., under New York laws; authorized capital, $5,000; to operate a garage. Corporators—Donald Rathbun, 158 Rogers avenue; Ada M. Hicks, 493 16th street; Sadie Plunkett, 365A Quincy street.

Richmond, Ind.—Pilot Car Sales Co., under Indiana laws; authorized capital $50,000; to deal in motor cars. Corporators—John E. Hays, Arnold Schaer, Herbert E. Bradford, Charles E. Hayes, Wm. D. Williams, Edward F. Goggins, Thomas F. Williams.

Sheldon Offers Choice of Bearings.

Despite the fact that Sheldon axles long since acquired a reputation, their manufacturer, the Sheldon Axle Co. of Wilkes-Barre, Pa., does not mean to stand on mere reputation, or to permit sentiment to stand in the way of it, which is another way of saying that the Sheldon company has completely revised its line of axles, brakes and jackshafts; besides which steel wheels have been added to the line.

For years it made use of its Empire ball bearings, a two-point adjustable bearing, but the demand for the non-adjustable type having arisen, the Sheldon people have gone the limit, so to speak, by taking the radical step of offering purchasers the option of almost any bearing they may desire. Included in the options are F & S, Hess-Bright, New Departure, Rhineland, Norma and Radax ball bearings and Bower and Standard roller bearings. They will be supplied either with hubs for wood wheels or with the steel wheels which the Sheldon company recently developed. Carrying the wide-open policy further, any of the bearings named are interchangeable with any of the Sheldon axles, steel wheels, or hubs for wood wheels, thus permitting a change of bearings without changing either axle, wheel or hub.

Also, the Sheldon Axle Co. has taken up the manufacture of a worm-drive axle. It is equipped with David Brown & Sons worm gears and is mounted on Rhineland double row annular bearings. The differential worm and gears are mounted on New Departure double row annular ball bearings.

PROMINENT MEN IN TRADE WHO ASSUME NEW DUTIES

Resignations and Promotions That Serve To Place Many Workers In New Places—Few Leave the Industry.

W. J. Ready, superintendent of the Lozier Motor Co. of Detroit, has resigned that position. He will become manager of the Star Motor Co. of Ann Arbor, Mich.

Edward R. Haybell has been appointed district manager of the Willys-Overland Co. for Texas and Mexico. Formerly he was a Southern traveler for the Studebaker Corporation.

Walter I. Jordan has been appointed Detroit manager for the Hoffecker Co., of Boston, Mass. Formerly he covered Western territory in the interests of the Flanders Motor Co.

B. J. Cline has been appointed superintendent of the Inter-State Automobile Co. of Munice, Ind. Previously he was factory superintendent of the American Motors Co. in Indianapolis.

J. M. Smith has been appointed production manager of the Henderson Motor Car Co. of Indianapolis. Previously he was factory manager of the Cole Motor Car Co., in the same city.

Charles Sargeant, mechanical engineer of the Remy Electric Co. and the American Rotary Valve Co., of Anderson, Ind., has relinquished those duties to become chief engineer of the Lyons-Atlas Engine Works, of Indianapolis. He will assume the duties about January 1st.

W. C. Gray, who was appointed manager of the Oakland Motor Co.'s branch which recently was established in New Orleans, has resigned that office and returned to his home in Buffalo. Temporarily the vacancy will be filled by A. B. Challinor of the Oakland branch in Atlanta, Ga.

G. D. Cairns is booked to sail from New York on Saturday next, 28th inst., to Buenos Aires, Argentine, where he will assume the management of the mechanical department of the Buick branch of the General Motors Export Co. in that South American city. Previously, Cairnes was associated with the Buick branch in Philadelphia in a similar capacity.

J. H. McDuffee has been appointed Western sales manager for the F. B. Stearns Co. and will have charge of the entire territory west of Denver, which includes the Pacific Coast. McDuffee is one of the best known automobile men in the West. He founded two companies which still bear his name, one in Denver, the other in Chicago, with neither of which, however, he now is connected.

Rockwell Produces Hydraulic Drive.

Stimulated, no doubt, by the extreme facility with which taxicab chauffeurs smash up gears and otherwise make junk of perfectly good public motor vehicles, A. F. Rockwell, president of the Yellow Taxicab Co., of New York, and of the New Departure Mfg. Co., of Bristol, Conn., has devised a novel hydraulic transmission that is expected to be practically fool-proof, to very considerably reduce the weight of the taxicab and do away with a number of parts, such as the gearset and clutch, that at present cause much trouble. It is understood that the new device differs considerably from other hydraulic transmissions, though the mechanical details have not yet been made public.

Silver Badges Reward for Long Service.

Not stripes or stars, such as are worn on coat sleeves by public employes, but applying the same idea, C. S. Mott, mayor of Flint, Mich., who also is president of the Weston-Mott Co., hereafter will reward Weston-Mott employes who have seen five years or more of service with silver service badges on which their names and their years of service will be engraved. The first of the badges were awarded last week, when 62 workmen were "decorated." At the same time, these Weston-Mott "veterans" were presented with insurance policies, the premium on which will be paid as long as the recipients continue in the employ of the company.

Eastern Plant for Holt Caterpillar.

The Holt Mfg. Co., of Peoria, Ill., which has an office in New York City, has purchased a tract of 17 acres on the Hackensack Meadows, near Newark, N. J., on which it immediately will begin the construction of a two-story concrete plant, 160 x160 feet. It will be utilized for the manufacture of the Holt "Caterpillar" tractor, the ingenious agricultural automobile which runs on self-laid tracks, a construction which makes the use of the tractor possible on very soft soil or uneven ground.

To Introduce Red Heads in Europe.

Krauss & Auerbach, 144 Queen Victoria street, London, E. C., have taken the foreign representation of the Red Head spark plug made by the Emil Grossman Co., of New York, the arrangement having been made by Emil Grossman himself during his recent visit abroad. He is authority for the statement that it presages an active campaign throughout all of Europe.

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In the RETAIL WORLD

John Patterson has purchased the Cedarville Garage in Altura, Cal.

Harry Jordan has opened a garage and salesroom in Coxsackie, N. Y.

The Black Hills Garage & Supply House, Deadwood, S. D., is erecting a new garage.

The Hare Motorcycle Co., of Columbus, O. has taken on automobiles; it has the Franklin agency.

C. S. McNeal is arranging to open a garage and repair shop in Richmond, Ind., on South 7th street.

A garage has been opened in Saginaw, W. S., by J. P. Beek; storage will be a feature of the business.

Wiese & Lennon plan to open a garage in Peoria, Ill., about January 1; the location is Main and Van Buren streets.

A. H. Buell has established a garage and repair shop in New Haven, Conn. He is located at 111 Water street.

Wm. Rankin is about to enter the trade at Minneapolis, Minn. He will operate a garage, sell supplies and handle Ford cars.

The Tarkington Garage on South Jefferson street, Marion, Ind., has been taken over by Ben F. Miller; Ford cars will be handled.

T. F. Corrigan has had plans prepared for the erection of a garage and repair shop in Milwaukee, Wis., on 36th street; it will cost $40,000.

Frank H. Osler and Fred Thompson of Pasadena, Cal., will open a tire agency in Los Angeles; they will handle the Kelly-Springfield line.

The Cheesman Auto Co. has purchased the Hayes Garage in Ogden, Utah; heretofore the Cheesman company has operated as agency only.

F. S. Krandall and W. O. Connor of Dallas, Tex., have arranged for the erection of a garage on Commerce street; the estimated cost is $15,000.

H. C. Smith is about to open up in Grand Rapids, Mich., under the style East End Garage; the location is at Wealthy street and Eighth avenue.

Newton Root, of Kalamazoo, Mich., has entered the trade as a dealer. He has the R. C. H. agency for Barry, Kalamazoo and St. Joseph counties.

The Viaduct Garage in Union, N. J., has been taken over by Louis A. Chatterton and William L. Draffin; the former owner was William Moeller.

Charles J. Conohan, proprietor of the Lake Side Livery in Milwaukee, Wis., has erected a garage; he will operate it in connection with his livery.

W. L. Scholl, formerly in the automobile trade in Hutchinson, Kan., has purchased the M. & L. Garage in that city; he has assumed personal charge.

Ruebuckert & Witt, of Masillon, O., have changed the firm name to Motor Car Sales Co. The business is to be enlarged and a repair department added.

Richard Olson, who formerly was associated with Konrad Hegle in a garage business in Lisbon, N. D., has withdrawn; Hegle will continue alone.

Riley J. Warren and B. J. Weber have formed a partnership in Oneonta, N. Y., under the style Oneonta Sales Co. They have secured the Ford agency.

James Warden, formerly connected with the Studebaker agency in Salt Lake City, has organized a selling company in Elko, Nev. Apperson cars will be stocked.

John Peak, Walter Stingley and James Colt of Manhattan, Kan., have formed a partnership and will conduct an agency; they will handle several lines of cars.

The Firestone Tire & Rubber Co. of Akron, O., is making ready to establish a branch at 197 East Gay street, in Columbus, O. It will be in charge of G. A. Richards.

Edward Bell and William Ducharme will open a garage in Marquette, Mich., about January 1; a building 63 x 27 feet has been remodeled for their use. They will handle cars, also.

John V. Wilson, who has been connected with the accessory trade in Boston for some time, has branched out for himself; he has hung up his sign in the Motor Mart Building on Pleasant street.

Luckenbach Bros. are about to open a new garage in Allentown, Pa., at 5th and Union streets; they have secured the Franklin agency and temporarily are located on South Fountain street, near Jackson.

Paul W. Thiel, for some time a registrar of deeds in Fond du Lac, Wis., plans to conduct an automobile business after January 1, with headquarters in Ripon; he will handle Hupp, Jackson and Premier cars.

Having succeeded the Enterprise Garage Co., of 2211 North High street, Columbus, O., the High-Lane Garage has removed to larger quarters at 2119 the same street; the company consists of O. L. Bott, J. C. Langler and W. J. Bott.

Frank M. Foster, for some time connected with the Boulevard Auto Co., at Gratiot avenue and the Boulevard, Detroit, Mich., has taken over that company's salesrooms and has set up for himself; he will deal in Kissel cars under the style The KisselKar Agency.

The Wilmington (Del.) Automobile Co. has opened a new garage on West 11th street, which will be operated in connection with another garage owned by the company at Delaware avenue and West 10th street. The new building has 16,700 square feet of floor space.

The Bracken-Stanton Co. has been incorporated in Columbus, O., with $5,000 capital and will handle Lee and Walpole tires at 4th and Gay streets; the officers are: President, Thomas E. Curtin; vice-president, Walter F. Bracken; secretary-treasurer, Leo A. Stanton.

Claude Owens, one of the first automobile tradesmen in Red Oak, Ia., has re-entered the field for himself after having been an employed shop foreman for three years; he has purchased the repair and supply department of the Rumsey Rubber Co. and will add considerable equipment.

The Grimm Automobile Supply Co. has been formed by R. E. Grimm, who formerly dealt in supplies at 604 North Broad street, Philadelphia, Pa. The new company has taken over the premises at 236 North Broad street, formerly occupied by the Penn Auto Supply Co., and will conduct a supply house.

Recently incorporated for $25,000, the Des Moines (Ia.) Motor Co. is about to take over the premises at 912-14 Locust street formerly occupied by the Herring Motor Co. The Herring company has a new building at 10th and Mulberry streets; the Des Moines company has secured the Studebaker agency. The proprietors are F. H. Hunter and O. F. Schee.

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The Electric Mfg. Co., of St. Paul, Minn., has increased its capital to $50,000 and February 1 will occupy a new two-story building, 50 x 150 feet; it also has arranged to represent the Federal Rubber Co., in addition to its other lines of accessories and supplies. A. R. Burr and J. E. Olen, formerly officers in the C. J. Smith Co., have joined the Electric company.

The Northwestern Tire Co., with $50,000 capital, has been incorporated in Minneapolis, Minn., with the object of reorganizing the company and shortening the name of the Northwestern Tire & Repair Co., of 622 3rd avenue, South; the personnel of the old company is that of the new one and consists of Frank J. Kerner, A. A. Kerner and J. C. Rooney. The company has secured the agency for Lee tires.

The Universal Auto Repair Co., of Hartford, Conn., has reincorporated as the Universal Auto Co. and will maintain a repair department at High and Allyn streets, supply and used car sales department at Ford and Pearl streets, and new car sales department on Ford street. The officers are: President, Herbert P. Seymour; vice-president, James P. Grady; treasurer, John F. Daly; secretary, William J. Langdon.

Under the style Raymond & Raymond a new garage business has been opened at 34 Sumner avenue, Spafford, Mass. Its building is 45 x 100 feet and the floor is marked by an absence of posts, giving freedom in the movement of cars. G. Clark Raymond, one of the partners, has been employed as a tester by the Stevens-Duryea company, while the other, Clarence E. Raymond, has been in the rental and repair business.

Joseph S. Donovan, who conducts a used car and livery business in Boston, at 36 Ferdinand street, has organized the Donovan Motor Car Co. and acquired the Studebaker retail business at 889 Boylston street. The Studebaker business in New England will continue to be handled by the New England branch, at 100 Cummington street, of which Philip E. Hawley is manager. Also, Donovan will continue his used car and livery business, with Alexander D. Adams as manager.

Recent Losses by Fire.

Oak, Neb.—Fuller's Garage, destroyed. Loss not given.

Kelso, Wash.—Rebb & Co., garage damaged. Loss not given.

Shreveport, La.—Avery & Spence Garage, 114 Milan street, damaged. Loss, $1,000.

Milwaukee, Wis.—Garage Equipment Mfg. Co., 742-48 South Pierce street, plant destroyed. Loss, $75,000.

FLANDERS COMPANIES' PACT ORDERED BROKEN BY COURT

Unusual Agreement, Continued by Receiver of Bankrupt, Objected to by Creditors—Receiver Instructed to Consult Creditors.

What foresight can be displayed and what can happen when one man is president of two distinct corporations was indicated in the Federal court in Michigan last week, when it developed that on August 1st, four months previous to the failure of the Flanders Mfg. Co., of Pontiac, Mich., that company entered into a compact with the Flanders Motor Co., of Detroit, whereby, even in the event of a receivership, the Detroit company was given the right to operate certain of the Flanders properties and continue therein the production of particular parts of the Flanders Motor Co.'s six-cylinder cars.

It appears that the patterns, jigs, axles and other parts of the Flanders Motor Co.'s "six" were being made in the Pontiac factory, the work being done, it is stated, with machinery furnished by the Flanders Motor Co. and material provided by the Flanders Mfg. Co., the latter working on the basis that it was to receive a fixed percentage above cost.

As the receivership terminated this rather unusual agreement, the receiver, the Detroit Trust Co., generously carried out the spirit of the neat little compact, entering into an arrangement with the Flanders Motor Co. by which, in lieu of the compact under which that company had been working in the Pontiac plant, the Motor company was to continue in possession of the property, the consideration being the payment of all its current indebtedness to the Flanders Mfg. Co., and in addition to the sum of $5,000 in cash for the use of the plant, the agreement to remain in force until April 15th, next. Walter E. Flanders personally guaranteed the account, also the payment of two watchmen who were to guard the property.

The Flanders Motor Co. actually had entered into possession of the properties of the bankrupt company in Pontiac before all of its creditors became aware of the proceeding. Immediately they awakened to the situation, however, three of the largest creditors filed an objection to the plan as favoring the Flanders Motor Co., and the court at once ordered the receiver to dispossess the temporary tenants and to enter into no further contracts without consulting the committee of creditors.

The receiver defends its action as one "dictated by ordinary business prudence" and maintains that the agreement obviated the necessity of creditors advancing any cash. The Detroit Trust Co. was to advance it at 6 per cent.

Maxwell Indiana Creditors Grow Anxious.

While there is no doubt that the manufacture of the Maxwell motor car will be continued, just what the reorganizers of the United States Motor Co. will do with the several Maxwell-Briscoe plants when they take possession next month appears to be shrouded in considerable doubt.

As Motor World stated three weeks ago, the Maxwell plant in Auburn, R. I., already has been closed; the original factory in Tarrytown, N. Y., also is practically idle, and the other, in New Castle, Ind., is the only one that has been actively operated.

Rightly or wrongly, the report has gained currency that the production of Maxwells ultimately will be concentrated in New Castle. But meanwhile some of the Indiana creditors of the United States Motor Co. have taken cognizance of the situation and on Friday last asked the Federal court in Indianapolis to modify the order of sale, which is to occur on January 8th. These creditors desire that the New Castle plant be sold separately, in which event, and as a going concern, they believe that it will bring the full amount of its appraisal, $644,000, while if offered with the other property its value is likely to be affected. This Indiana application somewhat complicates the situation, and before a definite decision is reached the petition probably will reach the Federal court in New York in which the United States Motor receivership proceedings first were instituted.

Jury Solves a Used Car Problem.

A plea that he supposed the car was new and not used did not prevail with a jury in Richmond, Va., last week, when Dr. Benjamin H. Bloxton, trading as the Overland Motor Co., brought suit against J. L. Lindsay, Inc., for $1,055, the price of an Overland car; the jury, after reviewing the circumstances, decided that Lindsay must have known the car had been used. The belief was based upon the plaintiff's story, which was that the car was sold originally to Louis F. Gregory, who later was sent to jail as a defaulter, and that after this sensation had subsided Lindsay took over the car, knowing it was a used model.

Lear to Lead Columbus Dealers.

Oscar Lear, one of the veterans of the industry, was elected president of the Columbus Automobile Trade Association, which was organized last week in the Ohio city of that name. The other officers are R. F. Boda, vice-president; Ross Shaw, treasurer, and A. W. Gill, secretary.

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THE SHOWS AND THE DEALER.

As to the value of shows, there always has been dispute. There are those who maintain that if ever they served the automobile industry—and there is no doubt that they did such service is either no longer necessary or no longer possible, in that the trade has outgrown its swaddling clothes and no longer requires to be coddled, paraded or amused.

Viewed from the Unfavorable Standpoint.

Those who hold to such opinions view the annual shows in the light of a detriment. Possessed of intimate knowledge, it is their belief that they are responsible for what amounts to a two-months' hiatus in manufacturers' affairs, in that it disarranges all plans and alike upsets the factory and sales organizations. They question whether the good influences of shows are sufficient to offset these ill effects.

Benefits That Offset Ill Effects.

On the other hand, there are those who as firmly believe that the good so far offsets the bad—that the stimulating effects are so great as to make the national shows worth all they cost. They maintain that, if not absolutely necessary, shows are extremely helpful to the dealer, and that whatever helps the dealer helps the manufacturer, from which latter dictum there will be no dissent. They contend that the shows of to-day are for the dealer, if not of the dealer; that if he has not already "signed up," they permit him to select his line under comparative and favorable conditions, or that if he already has selected it, or when he selects it, the stimulating effects of the show materially aid him in effecting sales, in which respect one of the most peculiar developments of late years, has been the number of dealers who bring their "prospects" to the shows as a decisive means of closing pending sales.

Awakening and Improvement of Dealers.

Whatever may be the true value of the annual shows, there remains no doubt of the value of the dealer himself. Appreciation of him has grown enormously during the past twelvemonth, and signs are not wanting of his appreciation of himself and of his mission, and that the way to fulfill it has increased and is increasing; which, in its way, is one of the most hopeful signs on the horizon. The dealer is bringing himself to understand that he is a merchant and that the study of merchandising plans and policies is necessary to the well-being of his future, which means that he is awakening to the value of all those things which constitute salesmanship—and there are many more of them than even many dealers yet have comprehended. Manufacturers are realizing that it is to their financial interest to further the awakening and to place at the disposal of the dealer more of those aids which contribute to the successful merchant.

Assisting Dealers to Become Merchants.

Without appearing boastful, we think we justly may say—and we believe the statement is amply borne out by its pages—that Motor World has contributed more than any other one factor to this much-to-be-desired state of things. We make bold to assert that no dealer, no garageman, no salesman who has read its pages with an eye to profiting by suggestion and by the experience of others, can fail to have been bettered, if the lessons have been turned to practical advantage.

Means of Increasing Shows' Usefulness.

The dealer's interests are Motor World's cornerstone, and as on occasion has been remarked, "that publication serves the manufacturer best which serves the dealer most." Motor World is unreservedly and wholeheartedly committed to that policy, and because of it repeats a suggestion offered long ago: that the national shows may be made of even more service to dealers, and, therefore, to manufacturers, if a part of the great buildings in which they are held are set aside for the display and exploitation of such aids to salesmanship as salesroom arrangement, window displays, lighting effects, advertising effects and all those other things which constitute what has come to be known as modern merchandising.

Reducing Show Evils to the Minimum.

The purposes they can be made serve are so far-reaching and bear such intimate relation to the well being of the entire trade structure, that even those who consider shows as necessary evils will feel that the evil has been reduced to a minimum.

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IMPORTERS' SALON WILL INAUGURATE SHOW SEASON

Ten Car Exhibits Representing Six Nations to be Staged in Astor Ballroom—Canada There for First Time.

Once more the very first of the New Year's automobile shows is to be the Importer's Salon, which is slated for the nine days beginning and ending January 2d and January 10th, respectively, and once more it is to be held in the magnificent ball room of the Hotel Astor in New York City, where silken drapings and artfully placed potted plants will serve to "set off" the 10 or 12 foreign cars that are to have the stage. The ball room itself is so imposing that it scarce requires decoration.

To be strictly accurate, there will be just 10 foreign cars on view when the doors are thrown open, or at least such is the promise, though among them all there is not one that is likely to prove new to New Yorkers. Each of them is fairly familiar, with the possible exception of one, and nearly all can be seen almost any day in the week on Fifth avenue. The single exception is the Austrian Daimler, which is to be exhibited by Healy & Co. The rest of the list includes the following well-known makes: De Dion, Isotta-Fraschini, Lancia, Mercedes, Metallurgique, Minerva, Panhard & Levassor, and Renault.

Also, for the first time, a car manufactured in the Dominion of Canada will be exhibited on this side of the border. It is the Keeton and it scarcely will be unfamiliar to Americans for the reason that it is virtually a reproduction of a car of that name made in Detroit.

In addition, three American body builders also will exhibit specimens of their handicraft mounted on various chassis. They are Locke, Holbrook and Quinby. According to present indications, the forthcoming Salon will prove very nearly, if not quite, as productive of unusual body types as was the last, which was conspicuous for this reason and also for the reason that it housed several foreign brands of Knight engines, not to mention the Argyle sliding sleeve engine which made its initial American appearance at that time. At the least, the cars will be less brightly painted, for it would seem that the effort to popularize vivid shades has not been entirely successful; the majority of the cars will be finished in more somber tones, with grays predominating.

Among the new body styles that are scheduled to appear are a completely enclosed four-passenger inside-driven limousine, of the type which is increasing in popularity abroad, and a new two-passenger landaulet. In the former there is no division between the front seats, the arrangement being similar to what in America has come to be styled "Sedan." Some of the bodies of this type are fitted not with the regulation stationary seats but with revolving seats, which permit greater freedom of movement and therefore tend to eliminate much of the monotony of sitting still any length of time in one position. Bodies, generally, will be lower than they were last year, though the decrease in height will be at the expense of the headroom. Incidentally, the tendency toward curved roofs instead of the older straight roofs will be just as marked in the foreign productions as it has been in American made automobiles.

Engine Exports Still Expanding.

More than the average gains in number and valuation are shown by the automobile engines exported from the United States to foreign countries during the past October, as compared with the same month of the preceding year; in October, 1911, 381 motors valued at $43,228 were exported, while in October, 1912, the corresponding figures were 862 cars and $109,610. This is an increase of 481, or 126 per cent., in number and $66,382, or 153 per cent., in value. The average value in October, 1911, was $114, and in the later month, $127. Owing to the fact that all gasolene engines were grouped prior to July 1, 1911, it is not possible to compare numbers and values for the first ten months of this and last years; however, up to November 1 last 7,695 engines valued at $943,813 were shipped abroad, while from July 1 to November 1, 1911, 928 motors valued at $108,325 constituted the automobile engine shipments.

Two-thirds Gain in Exports of Tires.

The volume of tires exported from the United States during the month of October last marked a substantial gain over the same month of the previous year, the increase amounting to 66 per cent. The monetary gain was $112,149, the monthly figures for the two Octobers being $169,980 for 1911 and $282,129 for 1912. The first ten months of the present year also gained 30 per cent. over the same period of 1911; the latter shipments were valued at $3,307,865 and the former at $2,545,248, a gain of $762,617. The exports were distributed as follows:

	Oct., 1911	Oct., 1912
Foreign countries..	$138,744	$225,704
Hawaii	12,966	35,706
Porto Rico.....	8,945	15,452
Philippines	9,325	5,267
Total	$169,980	$282,129



January 2-10, New York, N. Y.—Importers' salon in Hotel Astor.

January 4-11, Montreal, Can.—Annual automobile show in the Drill Hall and Armory, under the auspices of the Automobile Club of Canada.

January 6-11, Cleveland, Ohio—Cleveland Automobile Show Co.'s exhibit in the Central Armory.

January 11-18, New York, N. Y.—Automobile Board of Trade's 13th annual show in Madison Square Garden and Grand Central Palace. Pleasure cars only.

January 20-25, Philadelphia, Pa.—Philadelphia Automobile Trade Association's exhibit in the First and Third Regiment Armories.

January 20-25, New York, N. Y.—Automobile Board of Trade's 13th annual show in Madison Square Garden and Grand Central Palace. Commercial vehicles only.

January 21-26, Toledo, Ohio—Annual show in the Exposition building under the auspices of the Toledo Automobile Shows Co.

January 25-February 1, Providence, R. I.—Annual show of the Rhode Island Automobile Dealers' Association in the Providence State Armory.

January 27-February 1, Ottawa, Can.—Annual show of the Ottawa Valley Motor Car Association in Howick Hall.

January 27-February 1, Scranton, Pa.—Third annual show of the Scranton Automobile Dealers' Association in the 13th Regiment Armory.

January 27-February 1, Detroit, Mich.—Detroit Automobile Dealers' Association's Show in the State Armory.

February 1-8, Chicago, Ill.—National Association of Automobile Manufacturers' 12th annual show in the Coliseum and 7th Regiment Armory. Pleasure cars only.

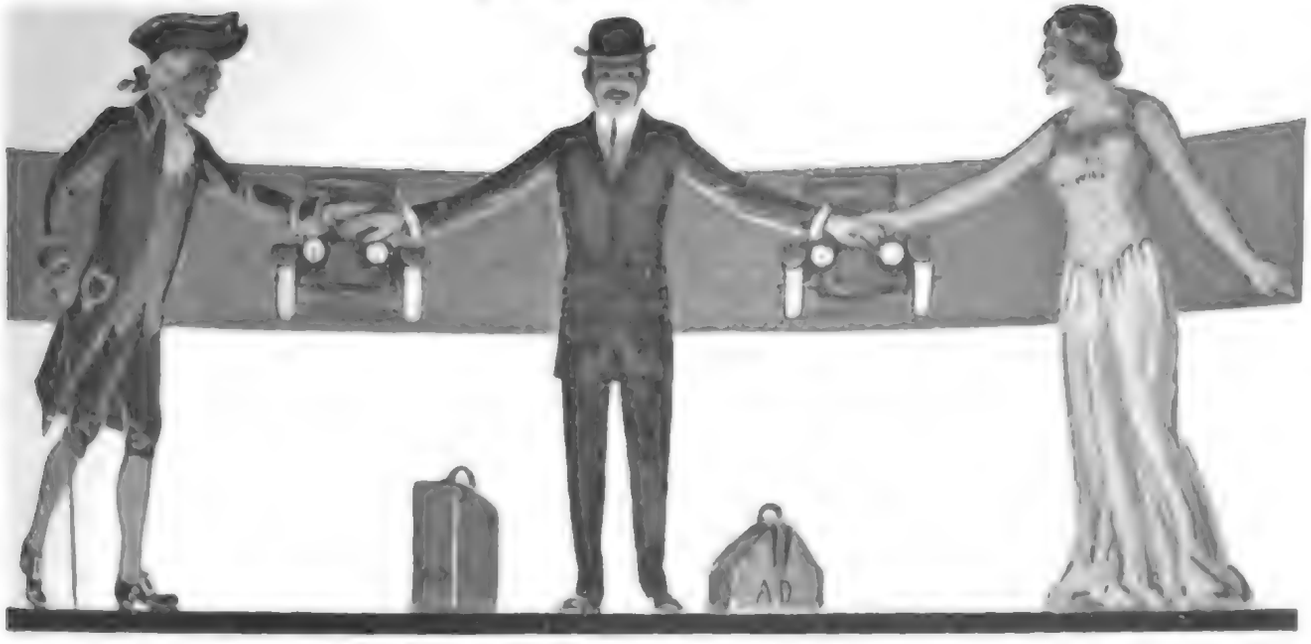
February 3-8, Washington, D. C.—Washington Automobile Show Co.'s exhibit in Convention Hall.

February 8-15, Hartford, Conn.—Sixth annual show of the Hartford Automobile Dealers' Association in the State Armory.

February 10-15, Chicago, Ill.—National Association of Automobile Manufacturers' 12th annual show in the Coliseum and 7th Regiment Armory. Commercial vehicles only.

February 15-22, Newark, N. J.—New Jersey Exhibition Co.'s Sixth annual exhibit in the First Regiment Armory.

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SPLENDOR OF NATIONAL SHOWS UNDIMMED

Settings for Both New York and Chicago Functions to be as Eye-pleasing as Ever and Exhibits as Numerous and Varied—Mirrors and Scenery to Embellish New York; Stained Glass for Chicago.

Many things happen in the course of the year—many things do not happen.

To this by no means startling existence that at least one-half of the Seventeenth National Show in New York will be held in Madison Square Garden in the two weeks beginning January [illegible].

There never was a doubt that Grand Central Palace would be utilized for the show or that that chapter of the national which is spread in Chicago would be opened as usual, in the Coliseum and adjoining First Regiment Armory.

But a year ago the trade throat, figuratively, was choked with tears. Madison Square Garden was to be demolished.

The edict had gone forth. It had been written on the block, so to speak, and the wreckers proposed razing it to the ground [illegible]. Everyone, everyone, or nearly everyone, hailed the "twelfth annual" the Garden's "good-bye show."

Of course all the things that did not happen [illegible] to the Garden.

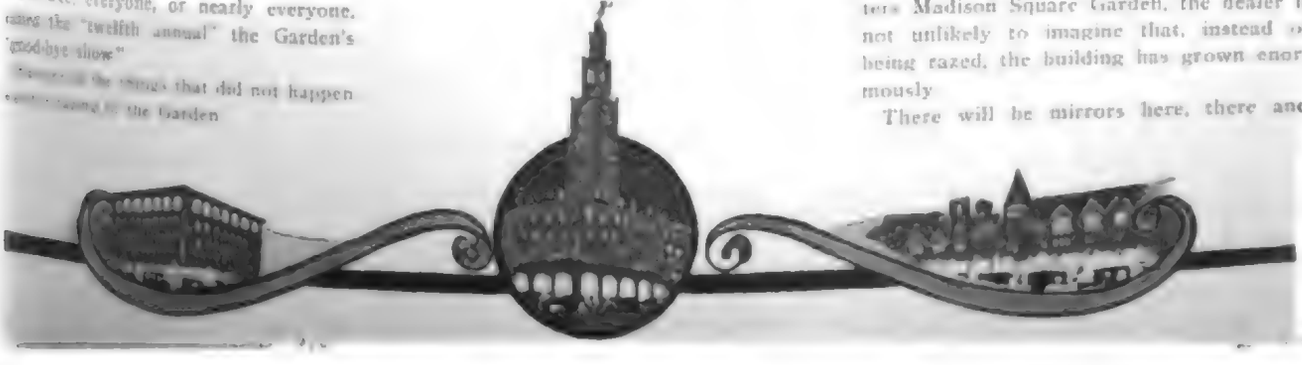
The famous building still stands on the old spot on Madison avenue and 26th and 27th streets, and again will blaze with light and glory and reflect the polished bodies, the shining nickel and one thousand and one other things that go to make a national show.

In fact, it will reflect more than polished bodies, shining nickel and things; it will reflect men and women, young and old, handsome and otherwise. For the Garden, for the first time, will be so greatly be-mirrored as to earn for itself the designation "Crystal Palace."

Although in point of numbers he will be overshadowed by mere sight-seers, the dealer is the man who will be most heartily welcomed by the exhibitors. He is the most important man of the show season, although he does not always recognize the fact. He is the quantity buyer—the man who truly keeps the wheels of the industry moving. He moves the goods the factory produces. Consequently, both Father Knickerbocker and Miss Chicago are uncommonly glad to see him; the greater his number, the greater the measure of their gladness. The sponsors of two great shows are not loath to admit that their efforts are designed largely for the dealer's benefit by enabling him conveniently to select his line and place his orders, if he has not already done so, or, if he has "signed up," to assist him to dispose of his goods, and more of them, by bringing to bear that stimulation of public interest which grows out of public exhibitions and which is believed to be far-reaching in its effects.

When he reaches New York and first enters Madison Square Garden, the dealer is not unlikely to imagine that, instead of being razed, the building has grown enormously.

There will be mirrors here, there and



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"The dealer is inseparably connected with the industry. . . . . The manufacturer cannot be successful unless his dealers are successful; their interests are so interwoven as to be identical."—George W. Bennett, vice-president, Willys-Overland Co.

everywhere—on the sides of the building and at the ends. The mirrors will lend simulated spaciousness to the already spacious interior of the building. It will look larger than ever before and there will appear to be very many more cars and very many more people than actually will be or ever were in the Garden during automobile show-time.

White will be the predominating color in the decorative scheme, but there will be a blue sky overhead—a "sky" which, it is promised, will be "soft and fluffy." Three immense crystal chandeliers and about 30 smaller ones will be suspended from the "sky." White lattice-work will predominate in the structural treatment and allegorical figures in white will appear to support the overhead galleries. Also, and as has been the case of late years, a white fountain, likewise of allegorical design, intermittently will play immediately within the main entrance to the arena proper. The railings and balconies will be festooned with flowers.

The other half of the New York show will be housed concurrently in Grand Central Palace, some 20 blocks further uptown on Lexington avenue. In other years, other shows have held the boards in both buildings at the same time but always under different management; but on the forthcoming occasion the Automobile Board of Trade will direct the destinies of both and, for the first time, one ticket will admit to both buildings.

As is the case with the Garden, the first week in the Palace will be given to pleasure cars and accessories and the second week to commercial vehicles and likewise accessories.

The Palace is not what might be termed an open structure; that is to say, it has no arena but, rather, a main floor and two galleries which form a deep court, or well. It is not a type of construction that readily admits of the use of a general decorative scheme. In fact, it scarcely requires more than incidental decoration, for the impressive grand stairway and the massive and imposing Corinthian columns on the main floor contribute a truly palatial effect that is not to be denied—cold and somewhat severe, perhaps, but not during show-time. For in the Palace also the decorative hand will have left its warming and artistic touch.

Landscapes and waterscapes and an open lattice scheme of decoration will impart the necessary warmth to the Palace. In the arched panels of the walls on the main floor the artist's brush will portray pleasing scenes drawn from Long Island, Delaware Water Gap, the Berkshire Hills and the Highlands of the Hudson. On the mezzanine floor a breath of the West will be felt; it will comprise views of the Grand Canyon and the Rocky Mountains, of prairies and ranches, and glimpses of California and its flowers. Higher up—that is, the balcony

PLEASURE CARS

New York, January 11 to 18

Madison Square Garden	43
Grand Central Palace	45

Chicago, February 1 to 8

Coliseum	64
First Regiment Armory	30
Exhibiting in Both Cities	76
Exhibiting in New York only	12
Exhibiting in Chicago only	21

COMMERCIAL VEHICLES

New York, January 20 to 25

Madison Square Garden	24
Grand Central Palace	42

Chicago, February 10 to 15

Coliseum	52
First Regiment Armory	19
Exhibiting in Both Cities	48
Exhibiting in New York only	18
Exhibiting in Chicago only	20

—will be dedicated to the sunny Southland, for there will be hung paintings of the famous Florida beach at Ormond, of moss-hung roads in Georgia and other suggestions of Dixieland.

One week after the New York show will have closed its doors, the portals of Chicago will swing wide, and the activities of the automobile trade will be transferred to the metropolis of the West; there they will continue within the walls of the Coliseum and the First Regiment Armory during the two weeks, February 1st to 15th, the first week being devoted to pleasure cars and accessories and the second to trucks and their appurtenances.

Since first the uniform scheme of deco-

"The dealer is the most important single factor in the automobile industry."—J. J. Cole, president, Cole Motor Car Co.

"Automobile dealers are of more vital importance to both the manufacturer and the buyer than is the dealer in nearly any other line of business."—Hugh Chalmers, president, Chalmers Motor Co.

rative treatment was adopted, all New York shows have been attractive and, therefore, pleasing to the eye, and all Chicago shows attractive and, if anything, more attractively spectacular.

In New York, as nearly as possible the decorative treatment has been made subordinate to the exhibits; in Chicago, the decorative scheme has been as conspicuous as the cars themselves, when, indeed, it has not been more conspicuous.

The Chicago show is the automobile spectacle of the year; it is one of Oh's and Ah's and fills more than half the eye.

The decorative hand always is daring in its originality. The mosaic temple of last year, the Louis XV idea of the year before and the English country estate of a still earlier year are not easily forgotten.

The forthcoming show will be as eye-filling and as eye-pleasing, and as original, as those that have gone before.

There will be mirrors in Chicago, too—and many of them—for, unknown to each other, the same desire to obtain the effect of spaciousness inspired the decorators of the greatest cities of the East and West, respectively.

If New York had not pre-empted the designation, Manager Miles, of the National Association of Automobile Manufacturers, under whose auspices the show is being held, declares that it would not be inapt to describe the Chicago function also as "Crystal Palace."

As it is, or will be, it probably will go down to history as the "stained glass show."

Cathedral glass will be the predominating feature. In the roof of the Coliseum will be 20 stained glass windows, each 22 feet square and all of the same classical nature. The front of the balcony will be similarly treated, and in the wall panels and girders and on the railing of the overhanging balcony mirrors will be disposed extensively, but not offensively. The stained glass effect will distinguish the partitions which will divide the exhibits and the illuminated signs which will be reared in each space.

Into the First Regiment Armory, which adjoins the Coliseum, stained glass treatment also will be carried, but on a less elaborate scale. Nevertheless, the decorative treatment of the armory will be more than usually pleasing—somewhat of a compliment to the manufacturers of electric



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GENERAL VIEW OF MADISON SQUARE GARDEN AS IT WILL APPEAR WHEN THE DOORS ARE OPENED JANUARY 11

...who voluntarily relinquished their ...space in the Coliseum in order ...might be grouped. For there ...peratively few electric cars in ...the New York show. They ...on quality what they lack in ...

...the main floors of each of the Chicago buildings will be of the same character and will be illuminated, and the centers of both structures will be freer from obstructions to the view than ever before, which means that the towering trees and mosaic towers of other years will be lacking.

The Coliseum will be lighted by 144 arcs, enclosed in stained glass, and the remainder of the show will be illuminated on the same scale. The stained glass will provide a subdued light; the more illuminating light will be contributed by clusters of red-white globes 12 and 16 inches in diameter, mounted on tall and highly ornamental pillars.

STRAWS SHOWING DIRECTIONS OF THE TRADE WINDS

Tendencies of the Industry Even More Clearly Marked Than Usual "Sixes," Electric Lighting and Full Equipment Most Conspicuous Developments but Effects of Refining Effort Apparent in Many Other Directions The Year of Greater Value.

...a real necessity for Christmas ...they roll around—of Christmas ...terms representing the progress ...en made in the automobile ...the past year and the ...ers—those who bestow such ...would have at least a small ...ed an apt term descriptive of ...

...had no particular difficulty ...ame; it was "engine starter ...any doubt, just as the year ...was the year of the closed-front ...will be the engine starter year ...than was 1912; also, it will ...equipment year," "six-cylinder ...the light year."

Great Value in Coming Year's Cars.

...pretty big mouthful to attempt ...six-cylinder - engine starter - ...equipment - electric - light - ...ow true it may be, and it ...like a straining toward ...thes)

...ings—six-cylinder cars, en... complete equipment, electric ...ment value; but it must be ... a capital V; therefore, the ... of the nascent difficulty ...ical way out is to start a ... and call the approaching

...Greater Value"

...difficult to pick out the ...the features big and im... Effort has been concerned ...stand forth quite boldly ...view the new crop of cars ...lumps of the old, so to ...been picked out and are ...a box, altogether, they ...potpourri that is all the ...ance and flavoring of do...

...ion of doubt one of the ...developments of the automo... the great increase in the number of "sixes." Contrary to expectations, however, there has been no material reduction in the number of "fours," and it does not appear that a serious reduction is imminent. All told, there is more than a dozen new "sixes." Some of them are the products of conservative manufacturers whose "fours" long have been known and some are the products of brand new companies, though to none of them does the word "freak" apply in any sense of the meaning.

Studebaker, Cole, Crow, Herreshoff, Hudson, Marmon, Stearns, Stutz, Warren, Lozier—all these names and more now stand for "sixes" as well as for "fours." The Stearns is a Knight motor, of course, and its introduction has served to take away some of the glory garnered by the Studebaker-Dayton Co. as the only American producer of a six-cylinder Knight motor. That there would be an almost overwhelming demand for "sixes" was forecast last year in Motor World, and conditions as they exist at present indicate that manufacturers have not been slow in appreciating the steadily growing sentiment.

TRENDS OF THE TRADE

INCREASE OF "SIXES."
INCREASE OF LIMOUSINES.
FULLNESS OF EQUIPMENT.
ELECTRIC LIGHTING AND STARTING.
LONG STROKE BLOCK CAST MOTORS.
WIRE WHEELS.
DEMOUNTABLE RIMS.
LONGER WHEELBASES.
LONGER SPRINGS.
LARGER TIRES.
LEFT DRIVE WITH CENTER CONTROL.
DEEPER UPHOLSTERY.
V-TYPE RADIATORS.
CLEAR RUNNING BOARDS.
THREE-QUARTER ELLIPTIC SPRINGS.
COWL DASHBOARDS
COWL GAS TANKS.
DIRT-PROOF CONSTRUCTION
IMPROVED LUBRICATION SYSTEMS.
QUIETNESS OF MECHANISM.
"SILENT" CHAINS FOR CAM-SHAFT DRIVES.
MAGNETO WORM DRIVES.
NICKEL TRIMMINGS.

Number of "Little Sixes" Greatly Increased

Many of the "sixes" already on the market and well established—such, for instance as Premier and Packard, Knox and Franklin, Lozier and Kissel, and others—have taken unto themselves little brothers, or, rather, "little sixes"; in fact, the birth rate of "little sixes" has been high, though whether the increase can be traced to the stimulation afforded by a new crop of low and medium-priced "sixes" from out the factories where low- and medium-priced "fours" are born, or the reverse is the case, it is difficult to determine.

Suffice to say, the "little six" which is brother to the "big six," and the more numerous low- and medium-priced "six" either by itself or as a younger member of an erstwhile four-cylinder family, both are here, and here to stay. Among the medium-priced "sixes" which are brothers, to continue the analogy, there are the Flanders and the Chevrolet, the Speedwell, the Firestone-Columbus and the Havers, all leaping close to the $2,000 mark—a figure that was considered fairly low even for a "four" not so very long ago. And, of course, there are the really low-priced "sixes" that constitute one of the big features of the year the Little, the Studebaker, and the Flanders, the former listing at $1,285 and the two latter at $1,550; the McIntyre, at $1,485, and the Herreshoff, which sells for $1,750.

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Coincident with the increase in the ranks of the "makes" there has come also an increase in the production and popularity of [illegible] and landaulet. At the last show these two types of cars seemed likely to be challenged by the coupe, but apparently the lamp that lights the way to popularity has been shifted, and the coupe now stands in a shadow. Roadsters, too, which last year were almost revived, have also lost out. The buying public seems to want passenger-carrying capacity.

This year the limousine's the thing, just as it is ordinary—no, not old-fashioned—of course, and there are not a great many manufacturers who have not adopted them as their families. And it is fair to exclaim, Luxury, thy name is limousine! For truly it does not seem that cars can be made more luxurious than are most of the present-day limousines.

"Completely Equipped" Wider in Meaning.

The phrase "completely equipped," which was used considerably and so often last year, will be used a great deal more often next year and with a great deal more pride and satisfaction, for it has taken on an entirely new significance. Most cars now are completely equipped in the real meaning of the words, with the accent on the "all." Top, windshield, speedometer, [illegible] tools, etc., no longer make "complete" as the word is defined by manufacturers. The list now includes electric lighting apparatus and engine starters as well, in the majority of cases electric horns, clocks, power [illegible] and even tire vulcanizers have been added to lessen the owner's burden of caring for it. It would be difficult to discover a sufficient number of cars to count on the fingers of two hands, that are not "completely equipped." And this despite the fact that not only have prices not been advanced as would seem perfectly justifiable, but they have actually been reduced in a great many cases. Verily it will be a year of greater value."

Engine Starters of Proven Efficiency.

Now that they really are items of equipment, combined electric lighting and engine starting systems which, from a small beginning last year, have increased in use by great leaps and bounds, deserve a more prominent place—a place by themselves—and they occupy nearly at the top of the scale of developments. The year 1913 may be the "engine starter" year, but it will be a totally different kind of an engine starter from that which last year was named by the innovation that served for last year's [illegible] evident at the time in the acetylene [illegible] now scarcely is evident at all. And though there can be little doubt that the acetylene starter works and works well, it is so easy to combine the electric starter with the equipment that furnishes electric lights, and there is so great a demand for the latter, that the acetylene starter naturally has been forced afar into the background.

For similar reasons, electrical equipment has put a decided crimp in the popularity of other types of starters, and there appears nothing to dispute the sway of the apparatus that can trace its lineage clear back to Benjamin Franklin, if not further. Of the 100-odd brands of cars that will be exhibited in New York and Chicago, not less than 80 per cent. will be electrically lighted with a proper and complete dynamo system, and at least 70 per cent. will be equipped with an electric starter as well. In most cases, such equipment is standard; in others it is optional and will be supplied, if demanded, few manufacturers having been near-sighted enough to overlook the necessity for making provision for it, even if they do not regularly supply it.

Now a Dozen Wire-Wheeled Cars.

Reminiscent of the pioneer days of the automobile, wire wheels, which may be styled a renewed development, bid fair soon to become an even greater factor in the automobile world than they have become in the past six or eight months. Last year wire wheels virtually were unknown; not one appeared on a car at any of the shows. In the interim, however, about a dozen car manufacturers have adopted wire wheels as standard equipment on at least one of their models, with wood artillery wheels optional, and more, to bring the grand total to over a score, give the option of wire wheels at a slight additional cost.

One of the more than ordinarily significant trends that will be very much in evidence, one which shows that a real problem has been attacked and solved probably for all times, is the clean sweep that has been made of running boards. At the last show the tendency to regulate tool boxes and battery boxes and other kinds of boxes to places less conspicuous was plainly apparent; some few manufacturers still used their running boards as conveniences for carrying equipment that better might be more advantageously "stowed," though most of them made a real "clean up." Next year the "clean up" will be even more drastic in its effect on appearance; not only have tool boxes and battery boxes been removed from running boards, but there is a well-defined tendency as well to locate spare tires at the rear of the tonneau. In this respect, it is noteworthy that the carrying of tires at the back of the car serves in a great many cases to afford a measure of protection to otherwise unprotected gasoline tanks which in many cars have slid backward from under the seat to a place adjacent to the rear axle, with a consequent adoption of pressure feed.

Lines Are Blended to Achieve Beauty.

In connection with the clearing of the running boards, there is another feature which is most apparent. It lies in the very evident attention which has been given fenders. From mere accessories, designed solely for the purpose of preventing the splashing of mud and water, they have become veritable things of beauty, with lines that "fit" and blend well with the lines of the car. Also, they are very much more substantial than they have been in the past and therefore exhibit less tendency to bend or rattle on slight provocation.

Another of the modern tendencies that it is impossible not to see is the general deepening of cushions and upholstery that has been made. When, at the last show, one or two manufacturers thought to have reached the limit of thickness and luxury with seat cushions 10 inches in depth—an unheard-of thickness at the time—it was fairly apparent that others soon would follow suit, though there were few who imagined that the deepening would be carried to the length it has been carried. Both 10- and 12-inch cushions now are common, and several manufacturers have adopted cushions of no less than 14 inches in thickness. Several others, however, whose conservatism is marked, prefer to stick to thinner cushions, on the theory that their wearing qualities are better and that they are less likely to become ill-shapen under extended service.

Development of Cowl Dash.

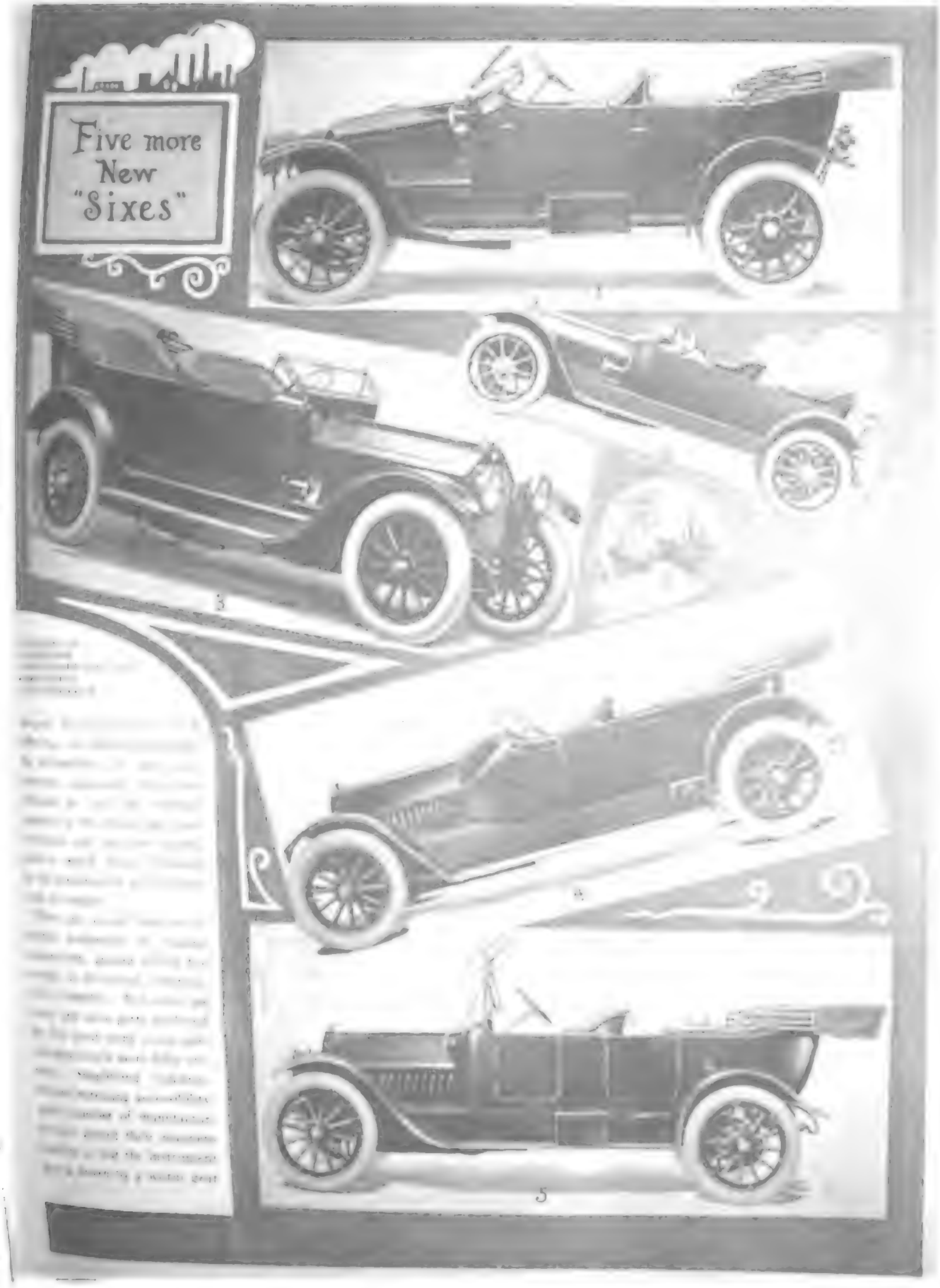
The practice of making of the cowl a sort of auxiliary dashboard mounting all the equipment that formerly occupied the shadow of the cowl on the real dash, is another development that was foreshadowed and forecast by the last show. It is only one of the tendencies toward the elimination of waste space which operates to increase the comfort of the motorist. More than a dozen cars now have their speedometers and switches, their carburetter adjustment and their oil gauges, etc., on a cowl dashboard, thus bringing them nearer the driver, where they are more easily visible and can be reached more readily. Cowls also are getting deeper, thus affording greater protection to the occupants of the front seats. In connection with the cowl dashboards, it is proper to note that the ignition coils which heretofore were prominent now almost without exception are placed behind the dash with nothing showing but a neat switch which really serves to beautify rather than to "clutter."

Among motors, the long-stroke holds its

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from a transverse shaft at the front. It goes without saying, of course, that reciprocating parts have been lightened perceptibly and that notable advances have been made in balancing methods.

Another important feature which cannot escape notice is the extent to which lubricating systems have been perfected. Practically without exception, manufacturers have improved their oiling devices to reduce rack cut from steer, gears machine cut and the consumption of oil, and even if the improvement can be traced to the necessity for eliminating smoke—the police of some of the larger cities have been unusually active of late—the fact remains that the benefit is directly the owner's.

Silent Chains Replace Timing Gears.

Of course, every one who has acquaintance bordering on the intimate with the newer crop of cars cannot fail to have remarked their quietness; there can be no doubt that the superlative degree of the adjective quiet is perfectly applicable to very nearly every car as compared with its predecessor. In this connection, the increasing use of "silent" chains for camshaft drives undoubtedly has played an important part. During the past year probably a dozen manufacturers of poppet-valve engines have ousted timing gear wheels, either spur or spirally cut, and have replaced them with "silent" chains. The increase in the popularity of "silent" chains for such purposes is particularly noticeable in the low- and medium-priced cars, though it is by no means confined to this class. A number of cars that list well up on the price scale are equipped with "silent" chain driven camshafts for the first time this year, and its adoption in so many cases would seem to presage its much more general use in the future.

So far, only one new engine of the Knight type has put in an appearance, or, strictly speaking, two new ones, though the second is an enlarged version of a successful "four"—a "six"—and bears the well-known Stearns nameplate. The newcomer in the field is the Edwards, and is the product of the recently formed Edwards company of New York City. As is but natural, it exhibits a certain number of minor refinements in design, though in the end it is the Knight engine all over again and differs but little from others.

Beneficial Effect of Sleeve Valve Type.

With the two exceptions noted, engines of other than the good old reliable poppet-valve type have not made any advances that are calculated to set the world by its ears. There can be no doubt that the introduction of the Knight engine has had a beneficial effect in stimulating the betterment of poppet-valve engines, and though other types of sleeve and rotary and disk valve engines come and go like the tides, none of them seems to gain sufficient impetus to carry it over the breastwork of incredulity thrown by the poppet-valve constituents. Worm drive, which also is more or less of foreign origin—or, rather, development—has made no strides worth mentioning, though one car more now is worm driven—the Edwards.

In chassis there is a well-defined tendency to more solid construction and the elimination of the rattles and squeaks that previously have proven distressing. Better lubrication, apparent in almost universal provision for greasing the spring shackle bolts by means of integral grease cups is responsible for no small part of the improvement, and the remainder can be charged to better construction and better fitting of mechanical parts.

Straight Lines and Blended Contour.

That the straight-line body apparently has come to stay is clear. But whereas the straight-line body a few years ago, or even one year ago, was at best but a crude attempt to eliminate the curving lines of the old-time coaches, the bodies of to-day are distinctively automobile bodies that contain no suggestion of their forbears. Lines now are properly straight, from stem to stern, and greater attention has been paid to obtaining a more harmonious blending of lines at the hood and at the back of the tonneau. In this respect the general casting-out of outside door handles that is apparent has played an important part in enhancing appearance. Similarly, the almost general use of nickel-plated trimmings instead of the universal brass of a couple of years ago, cannot escape remark. Also, the open front touring car and roadster, or runabout, is no more. All cars now have the full complement of doors, a feature which makers were not slow to adopt.

Change to Left Drive not Sweeping.

Contrary to expectations, left-hand drive with center control has not quite fulfilled its promise to sweep the boards before it. It is true that a great many manufacturers have either adopted it in bringing out new models or have altered older models, though altogether not 50 per cent. of the number of makes of car produced are driven from the left-side, whereas a year ago it was more or less freely prognosticated that its adoption would be very much more general. At any rate, it is significant that even the manufacturers of cars of established repute selling at prices that cannot be called medium by any stretch of the imagination have taken kindly to left drive with center control and the probability of its more widespread use in the immediate future, if for no other reason, seems assured.

V-type Radiator Evinces Popularity

Another noticeable feature of the newer crop of cars is the tendency toward the adoption of the V-type radiator and the cowl-located dash, not that the two necessarily go together, for as a matter of fact they are not shown in combination. At the last show there was but one car with a V-radiator, the Abbott-Detroit, but at the forthcoming shows there will be a half dozen or more cars which will appear slightly more rakish—and "classy" to those of that opinion—for its presence. The cowl gasolene tank appears for the first time on several cars that heretofore have had their fuel tanks in more orthodox positions, and of the new cars that have been brought out the cowl position appears the preferred.

As a rule, the cars of the new year will ride more easily than have those of the past, for a great deal more attention has been paid to obtaining greater resilience and at the same time reducing the tendency toward side sway and violent rebound. In three or four notable instances, manufacturers of cars that rightfully belong among the "upper ten," so to speak, have replaced semi-elliptic rear members with three-quarter elliptic members, and there are few cases where the length and width of springs has not been increased. Similarly, wheelbases gradually are getting longer and tires are getting bigger, though the increase is in section and not in diameter; large diameter wheels, except on underslung cars and on cars that are so heavy as to require more adequate tiring than can be obtained with ordinary size wheels, have lost grace.

Many Things Make for "Greater Value."

Taken all in all, however, nothing has been lost in the concrete during the twelvemonth just past; everything, or nearly everything, is a gain—it is a gain in actual value that will make next year "The Year of Greater Value" beyond the shadow of doubt.

Knowing all this, and particularly that the tendencies that have been outlined and the developments that have been pointed out, apply not to any one car but to many different brands of cars, there is perhaps some slight shade of logic in the supposition that all cars are more or less alike and that the features of one are the features of the other. But this is not so, most emphatically, and the surest and quickest way in which the erroneous impression can be cleared away and in its stead substituted a correct and truthful impression is by a car to car inspection under the guidance of one who knows them intimately and well.

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SHOWING THE DEALER WHAT'S WHAT IN CARS

Being a More or Less Personally Conducted Examination of the New Productions and New Features in Old Cars That Will Be Exhibited in New York and Chicago.

[illegible] think all cars are pretty much [illegible] there isn't so much that is new [illegible] very distinctive—close your eyes [illegible] and imagine the New York [illegible] exhibits under one roof, and [illegible] way and you will see some [illegible] not only cause your eyes to [illegible] that may help you select [illegible] and you in the selling the cars [illegible] attracted for.

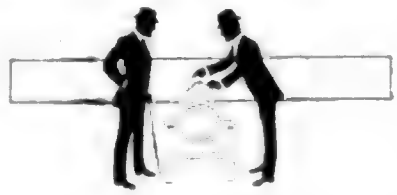
[illegible] the program; it won't help [illegible] get a copy of Motor World. [illegible] more in it than any program [illegible] and, whisper it softly, you'll [illegible] that is directly vital to you [illegible] selling of cars than you will [illegible] manufacturers' catalogs, even.



[illegible] a great many cases manufac- [illegible] made a number of minor im- [illegible] that those who have the educa- [illegible] don't think are of sufficient [illegible] to exploit in type. Not im- [illegible] importance? Well, maybe they're [illegible] then again, maybe they are; but [illegible] they are important to you, for [illegible] want to have "talking points." [illegible] are written for the [illegible] and not for the dealer [illegible] over the point when you have [illegible] to show a little. But hurry, [illegible] of ground to cover.

[illegible] right here with a bunch of [illegible] "sixes" that are such a big [illegible] year; they're all brand new—[illegible] to a real, public, automobile [illegible] Let's line them up here and [illegible] get, the Little, the Studebaker, [illegible] the McIntyre, the Krit, and [illegible] They look pretty much [illegible] they do—in price, but that is [illegible] otherwise they are just as dif- [illegible] day is from the night.

[illegible] the hoods and look at the mo- [illegible] for instance. Not so much similarity, [illegible] there? Look at the Studebaker. [illegible] cylinders cast in a single block [illegible] worm-driven from a cross [illegible] Looks like foreign prac- [illegible] So it does, but it rapidly is becoming American practice, for it tends toward quietness and greater accessibility. And look at the clean casting of that Studebaker, or of all of them, for that matter. None of your extraneous projections and pipes and wires that have marked cars of the past. Beginning to realize that there have been some improvements, after all!



Now, then, take a look at the Little engine. Quite a lot of difference, isn't there? Notice how the cylinders are cast in sets of three, each with the valves on the same side and fully enclosed. No chance for dirt to get in there, is there? And it makes the motors so much quieter. Now look at the way the Little magneto is driven—straight shaft through from the timing gear train with the lighting generator at the end. Neat arrangement—don't you think so? The Studebaker cylinders measure 3½ x 5 as against 3 5/16 x 4¼ for the Little. Not so very much difference in piston displacement, but look at the difference in stroke and bore ratio. Take a look at the intake and exhaust manifolds of the two engines. Note how they are cast integral with the Studebaker cylinders and how they are separate and afterward bolted on in the case of the Little.



The Herreshoff motor seems pretty long? That's easily explained. It is not all motor. Part of it is the clutch, which consists of 24 saw-steel disks, and the rest of it is the gearset. It looks long because it is all in one rigid unit. Another thing that makes it look long is the way the gear shift levers are mounted. Just examine that layout. Notice the vertical gate change. The whole arrangement is new all the way through, and have you ever seen anything simpler and more accessible? Both the Studebaker and the Little look simpler, you say? That's because you don't see quite so much in one look. The clutch is in the flywheel, of course, but the gearset is further back, in the waist of the chassis.

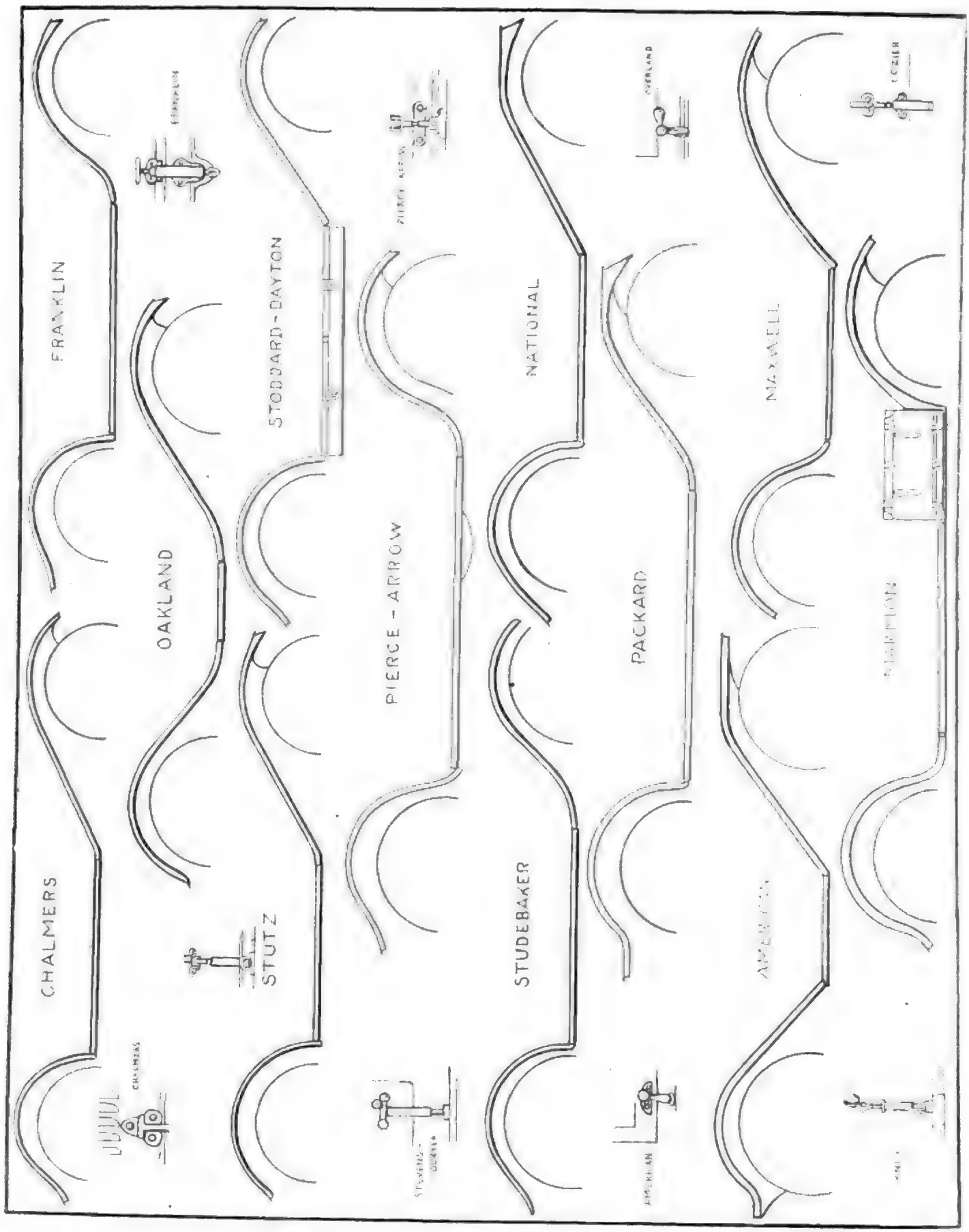
Step over to the McIntyre. Half a look reveals that though the cylinders are cast in a single block the arrangement is quite different. They are of the T-head type. Here again there is a difference in bore and stroke and a difference in stroke to bore ratio, too. The cylinders measure 3¼ x 4½. That means 40 horsepower, easy. Not so bad for a "six" that sells for $1,485 completely equipped, is it? And what do you think of those transmission elements? Multiple disk clutch running in oil to give smoothness, four-speed selective gearset, full-floating rear axle. They're all points



you never thought of finding in a $1,500 "six," are they not? But you can't dispute the evidence of your eyes. And how about the Flanders? Here's a motor that is different from the others. Six cylinders cast in a single block and measuring 3⅝ x 4½—that means 40 horsepower, too. Have a look at the gear shifting arrangement. It is selective with the lever in the center, but there is no H plate. Why isn't there one? Well, they don't need one, in the first place—simply a ball and socket joint that permits of a slight rocking movement. And look at the accelerator pedal; it's brand new. Notice the heel rest for the driver and the roller which obviates the necessity of shifting the foot. The clutch in the Flanders is a cone with plenty of engaging surface and spring inserts to ensure against gripping and slipping; the gearset is selective and provides three speeds and reverse. Ever see such variety before in a bunch of "sixes" that sell at really low prices?

Stand off, now, and take a long-distance perspective view of the five of them in a row. Notice that both the Studebaker and the McIntyre are steered from the right side, whereas in the Flanders and the Lit-

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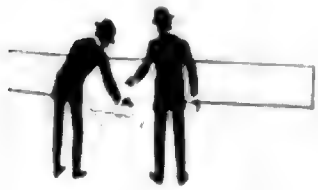


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tle and the Herreshoff the driver sits at the left side, both the Little and the Herreshoff, notice, have three-quarter platform rear springs, though they are unlike in nearly everything else. The other three have three-quarter elliptic rear springs, and all of them have semi-elliptic front members.

The Little and the Flanders come as a close passenger touring car, or an especially limousine or as a coupe or sedan. Plenty of variety there. And all of them fully equipped, as a matter of course.

What other models are there under the same plates? Haven't heard of the Little "four"? That's it over there, and it looks much like its six-cylinder brother so readily tell them apart. It's a roadster though its "vitals" are much like the "vitals" of the "six." It is, you "all on," as the British say, as American car completely equipped. There's only a two-speed gear in it, which is selectively operated; it has a beautifully flexible motor that at times makes up for the absence of the third speed. And what about the Mc[illegible]? Never heard of that, either? You've been asleep. Why, the Mc[illegible] is the car upon which the [illegible] organization has been built, and the car has been built so well that there is still room for improvement [illegible] Let's look her over.

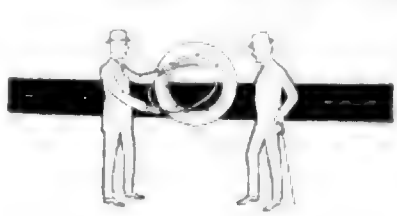


And you've heard all about the new [illegible] cars"—the ones that are so much like the new "six"? You know that they have both the new "25" and the "35" exactly like the motor in the "six" except for the number of cylinders? You must have been reading a trade paper, for it the only way you could find out, the cars are only alike factory. Take particular notice of the "25" which sells for $885; note the refinements that have entered into construction; the new transmission; the new semi-floating rear axle. See more real value for your money there? And now cast your eye over the "35." It has a 4½ x 5 motor the same as the "six," except that it has two cylinders less. It sells for $1,[illegible] completely equipped, even to lighting and engine starting system. Electrical equipment is one of the things not to miss. It has been chosen by the Studebaker engineers and the Wagner electric company's engineers—surely enough talent to ensure its being "right." A little pull on a flexible cable and the engine starts. That's all there is to it. Everything else is automatic.



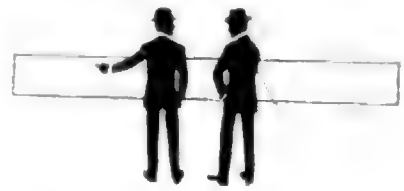
There's a four-cylinder Herreshoff you haven't seen yet, either. You saw it last year in the Palace, you say? No, you didn't. You saw a Herreshoff car all right but you didn't see one like this one. The designers have been at it since then, and they have made an even better job of it than it was before. It has a four-speed gearset now that it never had before, for one thing. You ought to see that. And another thing—it has a Westinghouse electric lighting and engine starting system that's new. But the price is very nearly the same. And, of course, you must see the other new Flanders "six," though having seen the smaller edition you will easily recognize the other. It's a little larger—has a 4 x 4½ motor—but otherwise it has all the Flanders earmarks, including a Gray & Davis electric lighting and engine starting system. High-priced? Not at all, even if it does look like it. They're asking $2,250 for the seven-passenger touring car at your right, and the four-passenger car goes for $2,200. Well-blended lines in both bodies, aren't there? And how do you like those new folding toonean seats?

What's that? Where's the car that was brought out simultaneously with the Little? Oh! you mean the Chevrolet. Right over here; you can usually identify it by that V-type radiator. Of course, other cars have V type radiators, too, but they haven't got three-quarter platform springs in the rear as well. Let's have a look at the engine, but be careful you don't scratch the paint in lifting the hood. That paint is expensive—that's why it's so glossy; there are about 18 coats of it there, too. Rest the hood on that little catch that is put there just for the purpose. Now stand off and



glimpse the compact, clean-cut engine. Almost square, isn't it? That's because the manifolds are cast integral and the valves are all enclosed. Notice how the cylinders are cast in threes and the peculiar Y-shaped intake.

Why does the engine run with so little vibration at high speeds. Well, one reason is that the crankshaft is carefully counterweighted with semi-circular weights, and another reason is that the reciprocating parts are as light as it is possible to make them. What's the power of the engine? It's rated at 40, though it has a pretty long stroke—cylinders measure 3½ x 5—and probably generates more. Now get down on your hands and knees and take a peek at that engine starting system. Notice the two-cylinder air compressor lying under the drive shaft and the way it is driven. Now look up forward at the flywheel and that gearing cut in the periphery. The pinion on the rotary air motor meshes with it, and when the air is turned on at the dash the motor "spins" a great deal faster than you or any one else can "spin" it by hand. It's pretty sure to start every time. Any more Chevrolets? No, not yet, though there will be another shortly. It's going to be a "50" and, like its predecessor, it is going to be a medium priced car. The "50" sells for $2,100.



Where are all the "little sixes," did you ask? There are some them across the hall—the Packard, and the Premier, and the Franklin; the Lozier and the Kissel and the Knox also are there—as fine a sextette of "little sixes" as you would ever want to see. Suppose we line 'em up, same as the other "sixes," and look them over side by side. That ought to give you another idea of just how much variety there is.

Take the Franklin, for instance. Every one knows that it has an air-cooled engine, and full-elliptic springs, and laminated wood sills. No, they have never been changed. They always have been exclusive Franklin features and, by the same token, the Franklin is the only air-cooled pleasure car at the shows. What's new in the "little six"? The motor, principally; everything else is just like the other Franklins and they haven't changed for a couple of years. The new motor measures 3⅝ x 4 and is rated at 50 horsepower, the valves being in the heads, of course, where they always have been.

What's the new electric lighting and en-

gine starting system that has been adopted for all the six-cylinder Franklins, you ask? It's the Entz, and it's one of the simplest on the market. Nothing to it but a combination motor and generator that is permanently geared to the engine; if the engine slows 'way down, or stalls, the engine starter doesn't have to be put in operation; it starts right in of its own accord and turns



the engine over till it starts again. When you are running along at touring speed, the motor-generator becomes a generator only and keeps the battery fully charged. That's simple enough, isn't it? Only one switch, too, and that one controls both the ignition and the starter. Have the other Franklins been altered much? Well, not so much that you can notice it. Of course, there have been a number of refinements, and the equipment has been increased by the addition of a Warner auto-meter, but in the end they are very much the same Franklins that have rolled over the roads and given a good account of themselves in the past.

Inspecting New Six-Cylinder Lozier.

Have a look at this six-cylinder Lozier at $3,250. What say? Not a Lozier at that low price? Of course it is. Look at that Lozier squarish radiator and hood, that Lozier control and those Lozier hub caps. Couldn't mistake them anywhere for anything else, could you? Prices reduced? Not a bit of it. It's a new model—a Lozier "little six"—and it is so much like the big Loziers that you might have some difficulty in telling them apart. That is, from an external inspection. But if you lift the hoods you will see the difference. The motors are quite different. The "little six" has an L-head motor with cylinders cast in threes, and the older "big six" has a T-head motor with the cylinders cast in pairs. Now do you see the difference? Also, the big motor measures 4⅝ x 5½, as against 3⅝ x 5½ for the small one. The lubrication system on both of the motors is one of the things you don't want to miss. It is somewhat like that used on Knight motors. Little troughs under each connecting rod are tilted upward, feeding more oil as the throttle is opened. Yes, it's new this year on all the Loziers, or, rather, on both the Loziers, for there are only the two chassis constructed. Both of them are mounted with new lines of bodies and both of them are fully equipped.

Latest Knox Almost Entirely New.

That other car over there with the V-type radiator? That's the new Knox "little six." No wonder you scarcely recognized it as a brother to the older Knoxes. It's got altogether different lines, and it is very nearly new all the way through. Sure, there are Knox features in it. The valves are overhead, for instance, and are located in detachable cylinder heads, same as the other Knoxes, the "four" and the larger "six." Why is it called a "little six," you ask? Well, it is smaller than the big "six." it's cylinders measure 4⅛ x 5½ as against 5 x 5½ for the larger "six" and it is rated at 40 horsepower, whereas the bigger one is rated at 60 horsepower. Lots of power? Yes; and both of them develop considerably more than their ratings. Notice particularly that the Knox three-plate clutch and the selective three-speed gearset are retained, the reason being that no room for improvement could be found. Any new equipment? Sure! They've added acetylene engine starters and dynamo electric lighting systems to all.

Here are two more "little sixes" that have been brought out during the year, and they are just as different as different can be—the Premier and the Packard. Set 'em over there and let's have a look at their externals. Both of them are driven from the left side, which proves that great minds run in like channels. Otherwise they are quite different. The Premier control levers are at the right of the driver, and in the Packard they are at the left.

Packard and Premier Retain Past Practice.

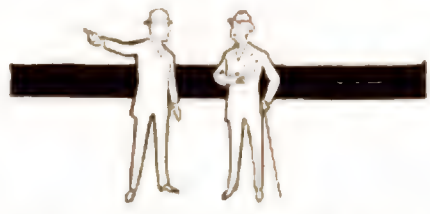
If you raise the two hoods you will find that the Premier cylinders are of the T-head type and are cast in sets of three, whereas in the Packard they are of the L-head type and are cast in pairs. Also take note of the difference in bore and stroke in the two motors; the Premier measures 4 x 5 and the Packard measures 4 x 5½. Do they differ very much from the larger models in the same lines? No, they don't, and there are many reasons why they should not differ from their older brothers. Think! Their producers have worked out their designs and proven them, so what is the use of changing them?

The larger cars in both lines are much the same as they always have been. In the big "six" Premier the steering connections have been changed slightly to increase the factor of safety, and that is about the only change that has been made. The motor measures 4½ x 5¼. It is just about the same with the Packard. A new rear axle casing has been adopted, and that is about the only change that is noticeable other than the adoption of a new oiling system which is interconnected with the throttle. A complete electric lighting and engine starting system has been added to all Packard models, and the new Premier is electrically lighted with a dynamo system. Before you leave these two cars, take a look at the Packard steering column control panel. Clever idea, isn't it? Everything right at the driver's fingers—ignition switches, lighting switches, carburetter adjustment, starter switch, everything. No need for a dash lamp here.

Over here is the Kissel "six." Suppose we make the rounds and pick out the "sixes" first; in that way you will get a better idea of the variety in construction and it will be easier to pick out the "high spots" of each. Forgetting about the "fours"? Not at all; we can look at the fours at the same time and in that way save time; that is to say, the "sixes" and the "fours" of the same brands.

Kissel Has Been Improved and Refined.

Notice how this Kissel "six" has been enlarged since last it was on view; larger tonneau, deeper upholstery, and don't overlook the electric lighting and engine starting system. What other new features are there? Probably the most noticeable one is that the wheelbase has been lengthened. Another thing—Kissel cars won't smoke any more; they won't even emit the hazy vapor that is characteristic, for measures have been taken to prevent it. They're simple measures, too. Simply a question of beveling the top piston rings and drilling a few holes through the grooves. How does that prevent smoke? The oil is pushed up to the top piston rings and then finds it way back to the crank case through the holes. Very little can get into the combustion chamber. Now, take a look at those rear springs. Notice the extra leaves to prevent rebound and to help out the others when the car is heavily load-



ed. What's new in the "fours"? Not very much; there has not been much room for improvement. The valves are larger in the "30" and both that and the "40" have larger bodies; so has the "50." Motor sizes of the "fours"? Sure! The "30" measures 4¼ x 4¼, the "40" 4½ x 5¼, the "50" 4⅝ x 5 and the "60," which is a "six," measures 4½ x 5¼. Surely the Kissel is a varied line.



LUXURY, THY NAME IS LIMOUSINE! IMPOSING CLOSED CAR STYLES

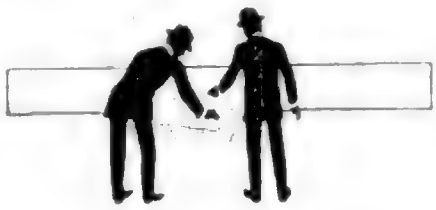
That distinctive-appearing tan and white car across the aisle is an Austin. You can nearly always identify the Austin by its color, if not by its rakish appearance. Lift up the hood and notice the individually cast cylinders with valve pockets on either side set at an angle. That's one of the exclusive Austin features, and the cylinders are cast that way to eliminate waste space and to get better shaped gas passages. Notice, too, the deep upholstery. It's probably the deepest in the show. No, nothing but "sixes" in the Austin line, the biggest of them rating at something like 72 horsepower. Oh! Yes; and that rear axle is new; it's a two-speed axle—something the Austins have just developed.

Alco Still Has the White Band.

Where's the Locomobile family? Just down the aisle a way; but don't let's pass the Alco without looking at it. What makes the Alco so easily distinguishabel among such a lot of cars? Why, that white band around the body. Sure! Some other cars have got it, but they don't seem to have it in exactly the same place as the Alco, and some how or other it doesn't look the same. The Alco engine, if you notice, is of the T-head type. It's a big, solid motor that delivers well over its rated 60 horsepower. Electric lighting generator? Of course; that's it on the left side; it's a Gray & Davis, and it is no wonder you almost missed it, for it is so small and it is painted to match the cylinders. Gearset? Four forward speeds with direct drive on the fourth. See how the clutch is enclosed in the flywheel housing? That's to keep out the dirt. Hard to get at for adjustment? Not at all; all you have to do is to remove a couple of small nuts and take off the top cover. Dry plates in the clutch, and it never needs lubrication. That's one of the little fine points of the Alco that not everyone sees. And look at the long, wide rear springs. Plenty of flexibility there. Another point—see how the gasolene tank is protected by the frame. Now, stand off and look at the bodies. Works of art, aren't they? Notice the way the lower end of the brake lever is housed and the "set" of the hood and the fenders.

Roominess in Locomobile "Little Six."

Now for the Locomobile. Why is that one called a "little six"? Well, it is a little "six"; it's smaller than the big "six" over there. Doesn't look much smaller, you say? No, not in the body, unless you make a pretty close examination; there surely is plenty of room and to spare in it. Still using the characteristic manganese bronze crankcase and gear case? Yes, and it scarcely has changed at all. It's lighter than iron and stronger than aluminum. That's why it is used. How does the "little six" differ from the big one? It has smaller cylinders, for one thing—4¼ x 5—and is lighter all over. Otherwise it is not very different. It has all the well-known Locomobile features—four-speed gearset, with the distinctive gate control; liberal road clearance with low center of gravity. Its lowness, by the way, is one of the things that make it distinctive. Still making the "four," the "30" that made such a hit? Certainly, there's it over there, and it is just the same as it always was, except that it has a new set of bodies. And while you are looking at bodies, cast your eye over these new limousines and coupes with their rounded backs. Rather distinctive, aren't they? And notice the large windows and the liberal amount of elbow and leg room. Complete equipment? Sure!—the latest addition being an electric lighting system. No, no electric starter; a Disco does the trick, and it is about the simplest there is. Almost forgot to mention that the "big six" motor has been increased to 4½ x 5½, and it gives 82 horsepower now.



Didn't know the Pope-Hartford company made a small car, eh? Well, you know it now; that's it—the one you're looking at. Don't see how you mistook it for anything else with that curved radiator top and hood. Thought it was too small for a Pope, did you? Look at the room there is in the body and you won't think it is so small; no necessity for crowding with five passengers aboard. Is the motor the same as that in the other Popes? Of course, it is. Those overhead valves account for a good deal of the extra power that can be gotten out of the engine. That's why they are retained. Cylinders are in pairs, you notice, same as in the other Popes, but they are smaller, of course. Yes, they're the same size as those in the big "six-60"—4 5/16 x 5½. Forty horsepower for the "four" and 60 for the "six." The little Pope is new all the way through, but the others haven't changed very much. An electric lighting and engine starting system has been added, a few minor improvements have been made, and that is about all. Oh, yes!—bodies are larger and the cushions have been given the touch that makes them softer and more luxurious. Not much change, but it is one that counts, nevertheless.

That business-like looking car over there is another of the medium-priced "sixes" that is making such a hit. It's a Chalmers. Not medium priced last year? No, it was not, but this is not last year. What of it if 900-odd dollars have been lopped off the price? The car isn't any smaller; nothing has been skimped. As a matter of fact, the materials are even better than they were, and instead of reducing the amount of equipment, it really has been increased.

Value in the Chalmers Offering.

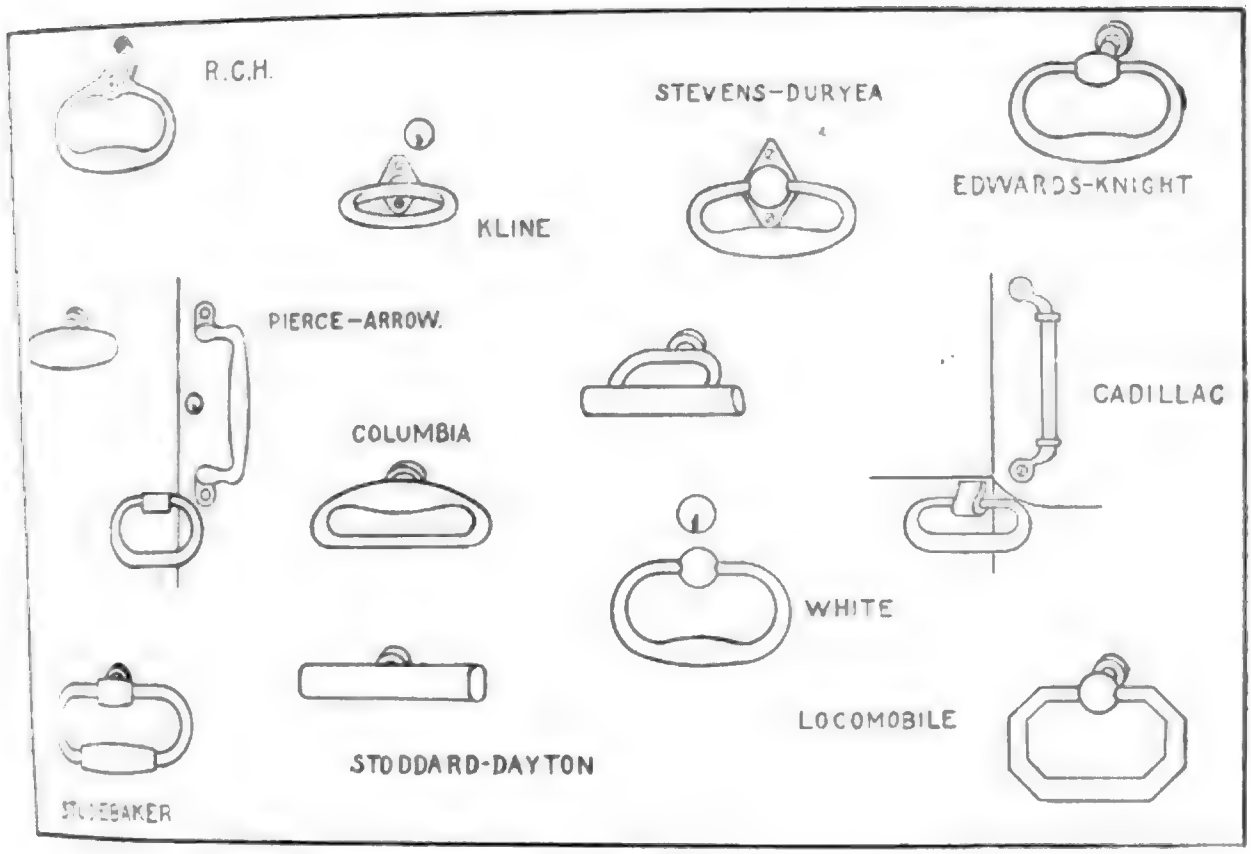
What does the seven-passenger car sell for? There's a catalog in front of you. What does it say—$2,000, with top and dynamo electric lighting system and compressed air starter and demountable rims and almost a hundred and one other accessories thrown in? Not so bad, is it? Alterations? Not many; the electric lighting system is new, of course, and the springs are longer and wider; also the steering mechanism has been made stronger, though it never gave any trouble in the past. Cushions are deeper, too—11 inches now; and there is a lot more room in the tonneau. Any "fours"? Sure there are "fours"! That's the "36" there; it sells for $1,950, that five-passenger torpedo does. Bodies look different, you say? They ought to, because they're all new. Notice the flush sides and the clever way the windshield is attached. The clean running boards are another thing you ought to take note of; nothing on them but the spare tires.

Cole, Too, Adds Two Cylinders.

Ever see a six-cylinder Cole? No? Didn't think you had, for this is the first time they have been exhibited. How do you like it's external appearance? Nice, well-blended lines, eh? Lift the bonnet and take a look at the motor. It measures 4⅛ x 4¼ and it delivers the biggest 60-horsepower you ever felt. Hard to start? No reason why it should be; it's fitted with the Delco lighting, starting and ignition system. Nothing to do but step on a pedal, and away it goes. Certainly, the system takes care of ignition, too. That's simple enough, isn't it? All you have to do is to put a little water in the battery once in a while—say, every month or so. Those are the Cole "fours" just behind you—the "40," which lists at $1,685, and the "50," which sells for $1,985 as a seven-passenger car. No, there has been very little alteration in construction. The "six" is new, of course—that's why you haven't seen it before—and the "fours" haven't needed much changing beyond a slight revision. They all have Northway unit power plants with the motor and the clutch and the gearset combined in a rigid unit that defies the disturbing influence of frame weaving.

Those well-finished appearing cars over there are the Fiats—three of them, the

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THERE IS INDIVIDUALITY IN EVEN SUCH SMALL THINGS AS DOOR HANDLES

[illegible] which is brand [illegible] most powerful stock [illegible] market, and the [illegible] complete line, isn't it? [illegible] "four" is the baby [illegible] Take a look at the three [illegible] difference? Of course you [illegible] they are different in size. [illegible] their cylinders cast in a [illegible] aren't they as clean [illegible] the way the magneto is [illegible] shaft at the front? [illegible] eliminate the necessity [illegible] also to make the in- [illegible] What's the size of the [illegible] About 5½ x 6½. That's [illegible] come to the milli- [illegible] 130 mm. x 170 mm. [illegible] horsepower with [illegible] motor any dif- [illegible] only in one little [illegible] release; that's [illegible] of the crankcase [illegible] moves the cam- [illegible] has two sets of [illegible] auxiliary set being a lit- [illegible] others [illegible] that the [illegible] off their seats until the [illegible] new "six"—the Firestone- [illegible] they made only "fours"? Well, you were right up to about a year ago. But they make a "six" now. No, you can't tell what it sells for unless you ask the salesman; prices are not given in the catalog. Continental motors used exclusively in these cars, both the "fours" and the "six"; guess there is no need for going over their fine points; they're too well known to need it. Notice that all the Firestones are left-hand drive, this year. That's new, and so is the placing of control levers in the center of the footboard where they are within easy reach.

Here's a Brand New Garford "Six."

That car with the unusual radiator? It's a Garford—a brand new Garford, and that is not such a queer-looking radiator, after all. Come over and look at it closely before you criticize it. Now, do you see what it is? Ever see a head lamp set into the top of a radiator that way before? No? Well, it's startling only because no one ever before mounted a lamp that way; it's a brand new feature. That one lamp is a powerful one; two are not needed; and it stands to reason that one lamp is less bother than two, no matter how little bother the two may be. Gives the car an unmistakably distinguished appearance, eh?

But don't go away with the idea that that is the only new feature in the car, because it isn't; the whole car is new all the way through and it fairly bristles with ideas. Take a look at the engine, for instance. Six cylinders in a single block and measuring 3¼ x 6. No doubt about it being a long-stroke motor, is there? Let's take off the cylinders and have a look at the internals. No, it's not hard to take them off. Just take off a couple of nuts and the cylinders lift up; that's one of the advantages of the block motor. Ah! there's the secret of it's vibrationless running. Notice the way the crankshaft is counterweighted, and the liberal bearing surfaces—four main bearings and all of them large. Now, observe the way the engine is supported in the chassis at four points and the compensating device which permits slight frame weaving without transmitting it to the motor. Big valves, too, aren't they?

Clutch? It's a cone with cork inserts to make it act smoothly. Of course, it has a four-speed gearset, but it differs from most others, however, in that direct drive is obtained on third. Take a look at that big, solid I beam front axle and the full-floating rear axle with its one-piece drop-forged casing; notice the liberal brakes and the way the pressure is applied. Bodies? They're made of steel and they're welded; Turkish cushions make the seats comfortable, and the price is out of all proportion to what

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you'd think it is. The five- or seven-passenger car there, with complete equipment, including an electric lighting and engine starting system and an electric horn and everything else that goes to make up a well-equipped car, sells for $2,750. Look it over again; it will pay you to spend a little time here.

"Sixes" Selling for Less Than $2,500

Here's a couple more "sixes" that are new this year—never shown before—the Hudson and the Havers. The Havers is not a new "six"? No; the "44" isn't, but that big one there, the "55," is new. The Hudson, of course, is a new model, and a mighty attractive one, too. Let's put them side by side and compare them. Lift up the hoods first and let's see the motors. Both of the L-head type, are they? But notice that the Havers cylinders are cast in pairs and the Hudson in threes. Also, there's a little difference in size. Hudson cylinders measure 4⅛ x 5¼, and the Havers cylinders measure 4 x 5. Both cars have multiple disk clutches, you will notice, and both have three-speed selective gearsets. Otherwise they have few features in common, which is but natural. Any other Havers or Hudsons? Sure! There's the Havers "6-44" you noticed over there—it has a 3¼ x 5 motor—and the Hudson "37," which is a four-cylinder model which has many of the features of the "six." The cylinder dimensions are the same, for instance, and so are the clutch and gearset. Difference in price? Well, the Havers "6-55" sells for $2,250 as a five-passenger touring car and the Hudson "six" of the same kind sells for $2,450. Not so very much difference, at that. The Hudson "37"? Sells for $1,875; all of them have electric lighting and engine starting systems as regular equipment.

Kline's Convertible Roadster-Coupe

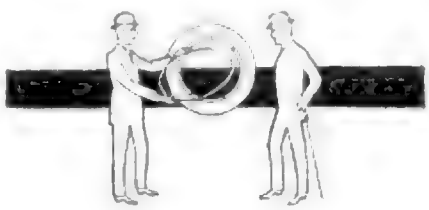
Are there any "sixes" among those Klines? Yes, sir; two of them—a "50" and a "60." No, the Kline engineers have not found much room for improvement. The cars are pretty much the same as of old, though there have been notable increases in the equipment—there has been a Rushmore electric lighting system added, for one thing; and, say! do you see that nifty-looking coupe over there? Handsome, isn't it? Does the coupe part of the body lift off? Don't know why it should—but hold on a minute! Yes, it does, too. What do you know about that! Never know anything was missing with it lifted off, would you? What's left is an uncommonly good looking roadster. And notice the clever way the two parts of the body are fastened together, so that the dividing line scarcely is visible, and it is impossible for dust or water to get in. What chassis is it mounted on? Any of them, except the "4-30," and that means both of the "sixes" and the other "four," which is rated at 40 horsepower. Expensive? Not so very; it costs $2,750 on the "40" chassis, $3,350 on the "6-50" and $3,750 on the "6-60." Yes, the price includes the top—of course; equipment, too.

The Lenox That Comes from Boston.

What say? Never heard of a Lenox "six"? The Lenox that comes from Boston? You don't know what you have missed, then. You see the Lenox "four" over there? Well, that's the "six" beside it. Don't see how you could miss it, because the two look so much alike. The "six" is larger and longer, of course, but still they look like brothers. What size motor in the "six"? It's 4 x 5 and is rated at 60 horsepower. Get down and take a slant at the gearset combined with the rear axle; it is selectively controlled and provides three forward and one reverse speeds. The price is $2,750 for a six-passenger touring car, and it includes complete equipment, which means an electric lighting and engine starting system, too. The "four"? It has a 4¼ x 5½ motor in it rated at 40 horsepower. Any of the open bodies except the speedster, which sells for $2,100, can be bought for $2,000. Equipment? Of course.

McFarlan and Its Block Motor.

While you are over here, have a look at these McFarlan "sixes." Another "six" you never heard of, eh? Where have you been for the last year? Put the three McFarlan models together and look at the motors. Model T, you notice—it's a new model, by the way—has a block motor, the cylinders measuring 4 x 6; model S, which also is a "six," has the cylinders cast in blocks of threes, the dimensions being 4 x 5; and model M has its cylinders cast in three pairs with a bore and stroke of 4¼ x 5, respectively. All of them have multiple disk clutches, though in the T and S cars the gearset is on the rear axle; in the M cars, it is a unit with the motor. Any changes since last year? Not very many; Vesta electric lighting systems have been added to all of them and in the S cars, the motor is hung on three points instead of four. Another change in the "six" is that the air compressor for the starter now is driven directly by the motor instead of through gear. The equipment of all the cars also has been



increased and there is scarcely anything missing now.

Marmons With Gearsets in Rear.

This car is the Marmon "six," big brother to the famous Marmon "32." How old is it? It isn't old; it's new—this is it's first appearance. Notice it has the same kind of a T-head motor as the "four." The dimensions are different, however, the "four" measuring 4½ x 5 and the "six" 4½ x 6. Wish you could see that Marmon oiling system; the oil is forced through the hollow crankshaft right into the bearings under pressure. Easily clogged? Not a bit of it. You'd be surprised the pressure the oil is under; nothing that could ever get in would clog up those pipes. Here's a difference between the two cars: The "four" has a cone clutch and the "six" has a dry-plate multiple disk clutch. Both of them have their gearsets on the rear axle, however. The "four" looks different, you say? Well, it ought to, inasmuch as the steering wheel has been shifted over to the left side with the control levers in the center. The "six" is steered from the left side, too. Take a look at the trunk on the "six." Neat location for it, isn't it? By placing it there the manufacturers have utilized a little space that ordinarily goes to waste. Improves the appearance of the car a lot, too—don't you think so? Price of the "six"? Any of the open body styles list at $5,000. There is a new front axle on the "six," too, that you ought to see. The feature of it is that the spindle is placed directly in the center of the wheel plane. That makes for easy steering and a fairly short turning radius.

Distinctiveness of the Matheson.

Here's the Matheson. You can't possibly say you have never heard of the Matheson "silent six." Know it anywhere, wouldn't you? There's no mistaking those overhead valves and that heavily reinforced frame. Anything new in the Matheson? Sure there is! There have been a number of changes made, but the motor is about the same—cylinders measure 4½ x 5, same as ever. But notice the rear axle, for instance. See how it has been increased in size and strength? It has larger bearings. The brakes, as well, have been increased in size—the service brake drum now is no less than 17 inches in diameter. The gearset, too, has been altered slightly, the first and third speeds having been reduced and the second increased. Now, go back to the motor and look at the new valve cages. A great deal simpler, are they not? They're cast, too. The cooling system, also, has been enlarged; the flywheel now has fan blades instead of ordinary spokes; the pressure on the fuel tank now is maintained by means of a positively driven pump instead of by

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exhaust pressure. And so on all through the chassis little things have been changed here and there, though no really big changes have been made unless the addition of a complete electric lighting and engine starting system can be called a change. Matheson "four," the "Big Four"? No, no more; the "six" is the only Matheson.

Norwalk Introduces a Racy Type.

Look at those two "sixes" over there; they are no more alike than are horses and cars. That low-slung, racy-looking car is the Norwalk, which bears the distinction of being the only six-cylinder underslung car on the market. The one beside it is a Mitchell. Quite a little difference, isn't it? Notice how low the Norwalk is. That's because the frame is hung beneath the axles instead of over them. If you look at the Mitchell you will see the difference. If you look under the Norwalk you can see how straight the drive shaft is. The Norwalk motor? It measures 4½ x 5 inches, as you can see, and is cast in sets of three. Different from the other Norwalk motors, you ask? It is, in fact, if you remember. Norwalk cars last year had an overhead valve motor with valves cast in pairs. Quite a difference, isn't there?

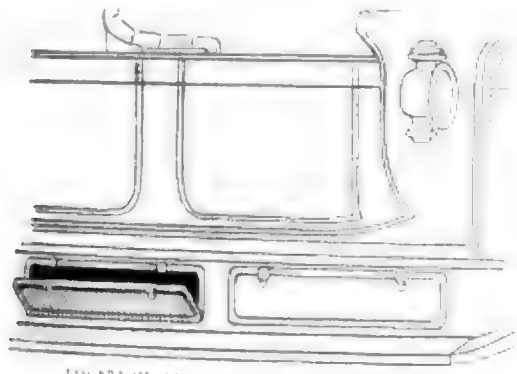
Mitchell Adopts "French-type" Body.

Now let's take a look at the Mitchells. Yes, there are Mitchells. No wonder you don't recognize them. They've been remodeled from stem to stern. In the first place, they have what the designers call "French-type" bodies with straight lines and deep tonneau. Also the motor is of the T-head type and it has an exceptionally long stroke—6½ x 6 in the case of the 50-horsepower and 4½ x 7 for both the four-cylinder car and the "six," rating at 60 horsepower. No, they are not the longest stroke motors in the show, several other motors have seven-inch strokes, but no other has such a long stroke combined with such a small bore. Notice particularly the forward construction of the motor, the fan and the magneto assembly. And then step behind and see the way the electric lighting generator is mounted over the propeller shaft and connected to it through a "silent" chain. Another feature about the Mitchell you don't want to miss—yes, it is common to all—is the gearset. Three speeds are provided, selectively obtained, and it is peculiar in that the reverse pinions are stationary except when reverse gear is engaged. Therefore the gearset is just about as quiet as it is possible to make one. What do the new Mitchells sell for? The "40" sells for $1,500, the "50" for $1,850, and the "60" for $2,500, and they are fully equipped at that price, too.

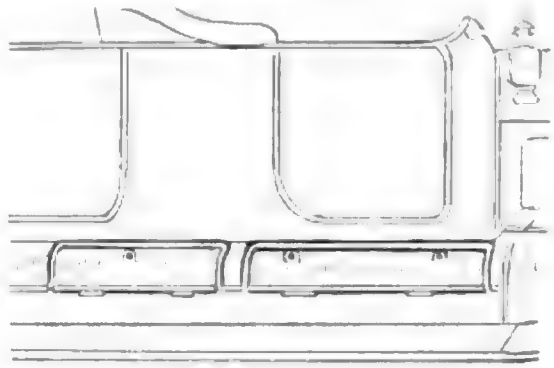
Put the Oakland and the Oldsmobile together and you will notice another startling difference. Oakland is not complete, you say? Yes, it is; the running boards are used to run the length of the running boards? Very evidently they're gone. In their place there are two lockers beneath the frame, out of the way, leaving the running boards perfectly clear. There's another new feature of the Oldsmobile you want to look at—the way all the control elements other than the levers have been placed on a cowl dash close to the driver. Not much of a stretch to reach them, is it? Any more Oldsmobiles? No; there is only the one model this year, though it may be had in a variety of body styles. Just cast your eye over them; they're all new, and they're thoroughly up to the Oldsmobile standard of excellence.

Oakland "Four" Resembles the "42."

Any four-cylinder Oaklands? Certainly, brand new. It's called the "35" and has there are. That little one behind you is



LOCATION OF OLDSMOBILE LOCKERS



MATHESON TOOL STORAGE SPACES

made that way purposely. A good part of the running boards never are used anyway, and, so those two aluminum steps are quite sufficient. And it reduces the weight and gives the car quite a distinctive appearance, too. Examine the V-type radiator with which the Oakland is equipped. It's made of German silver—another of the distinctive Oakland features.

Now, let's compare the Oakland and the Oldsmobile "sixes." No Oakland "six," you say? O, yes there is. You may not have seen it yet, but if you will turn around you will see it now. It's just been brought out; that's why you haven't seen it before. Now, if you look at the motors you will see that both are cast in pairs, and that they have the same bore and stroke—namely, 4½ x 5¼. The Oldsmobile motor forms part of a unit power plant. Notice also that they both have cone clutches.

There have been few mechanical changes in the Oakland, but if you look closely at the Oldsmobile you will discover that it is new all the way through and that it bears little resemblance to any of the Oldsmobiles that have gone before. Where are the distinctive Oldsmobile tool boxes which been brought out as a sort of smaller brother to the larger "42." It is pretty much like the larger car, too, and there have been mighty few changes made in the older one. It's been refined, as a matter of course, and the equipment has been increased, too, though it is much the same car that it was.

Gray & Davis System in Peerless.

Now, let's go over and take a look at the Peerless line and see how much more you can learn in a short space of time. Any new models? No, none; the old ones are continued with very few alterations beyond the addition of a Gray & Davis combined electric lighting and engine starting system; they had only electric lights last year. There they stand, the four of them—the "38-6," the "48-6," the "60-6," and the "40-4." Quite an impressive appearing group, don't you think? Now, suppose we delve into them and discover just what is new. The newest thing, of course, is the electrical apparatus. Outside of that, you will find a new butterfly throttle valve in place of the piston valve used in the past—it permits lower throttling; then you will find that dual ignition has been adopted in place of double ig-

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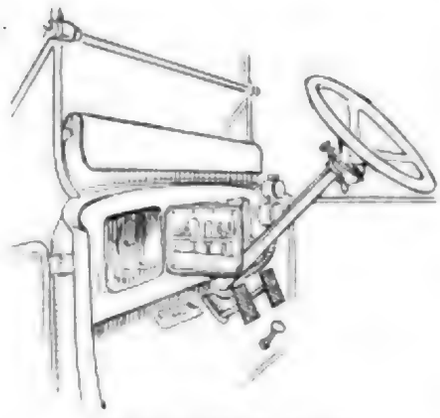
nition. Why? Well, it was discovered that the battery plugs in the dual system were so little used and they sooted up so readily that thy were not worth retaining.

If you look still further, you will find that the sizes of the front tires on the "38-6" have been increased to 36 x 4½ to conform to the size of the front ones. That makes the carrying of two different sized spare tires unnecessary. The same change has been made in the "48-6," only the tire size is 38 x 5½. Pretty big tires, aren't they? Notice also that the side lamps have been taken off and that their place now is taken by imbedded lamps. Another thing—the windshield stays now slant backward instead of forward, leaving the front of the car unencumbered.

Force-Feed Oiling in Pierce-Arrow.

If you look straight across the hall until your eye encounters a gracefully arched limousine roof—arched at the door so as to give more head room in entering—you may be pretty sure it is a Pierce-Arrow. You're right; there are none better. That arch in the roof is one of the distinctive features of the Pierce-Arrow car, and the way it has been copied ought to warm the cockles of the designer's heart. Lift up the hood of the nearest car—the big "66." Surprised at the absence of the familiar oil tank on the side of the cylinders? No more will it have a place on Pierce-Arrow engines. Its place has been taken by a brand new force-feed oiling system, the heart of which is a powerful pump. The oil now is pumped direct to all the bearings. More efficient? Of course it is, for the supply of oil varies as the engine speed varies—the faster the engine runs the more oil it gets, and vice-versa. Notice, also, while you have the hood up, that leather universal joints now are used in the magneto coupling and that the fan bracket is made with a screw adjustment with which to tension the belt.

What is that pump for? That is to compress air for the starting system. Didn't know they used starters, eh? Well, they do. The pump stores air in a tank under 200 pounds pressure, and it is admitted to the cylinders in rotation by means of a rotary distributer. Take a look at the clutch, now, and notice that it is fitted with cork inserts, the German bronze having been eliminated. Another important change is that there now are two universal joints between the clutch and the gearset and that the gearset is 4½ inches nearer the rear, permitting more easy disassembling of the clutch. Never heard of a tubular propeller shaft you say? Well, here's a chance for you to look at one. The Pierce-Arrow propeller shaft is a tube instead of a solid bar as heretofore. Don't



PIERCE-ARROW DASH

think it will be quite as strong? That shows what you know about machinery. It's actually stronger. If it was not you may rest assured that the Pierce-Arrow engineers never would have permitted it to be used. No, there have been no really radical changes in the line—the "38-C" motor dimensions have been increased from 4 x 5½ to 4 x 5½, but that is not a radical change—though when even the Pierce-Arrow engineers can find reason for small changes it is significant of the trend toward perfection.

Here's another new "six" that may have escaped you. It's a Pullman. Never heard of a Pullman "six," either? Well, that's pardonable, for it was only brought out a few months ago. Still, there are quite a few of them in the hands of owners, even though they are young. As a matter of fact, both the "six" and that "four" over there are new cars—brought out simultaneously, you know. Both have the same T-head, pair-cast motor with 4½-inch bore and 5½-inch stroke. The little one over there that is not so little after all is the "4-36"; it has not been changed very much. Take a look at the new 19-inch rubber steering wheels



GARFORD HEADLAMP

with which all the cars are fitted. And notice that the horn now is located beneath the hood, where it is out of harm's way and less likely to become clogged with road dirt. Also make a note of the fact that the springs are longer and wider, that the tire irons now are at the back of the tonneau, that the running boards now are perfectly clean and that the oil and carburetter adjustments have been brought up to the dash. One of the things you can't see, though you can learn about it, is that the motor and the gearset and the steering gear and very nearly every other part is made right at home in the Pullman shops. Another thing to make a note of is that the gearsets are unusually substantial. Prices? The "six" in seven-passenger touring form lists at $2,750, with complete equipment, too. The "4-44" and the "4-36" list at $2,150 and $1,875, respectively, with five-passenger bodies.

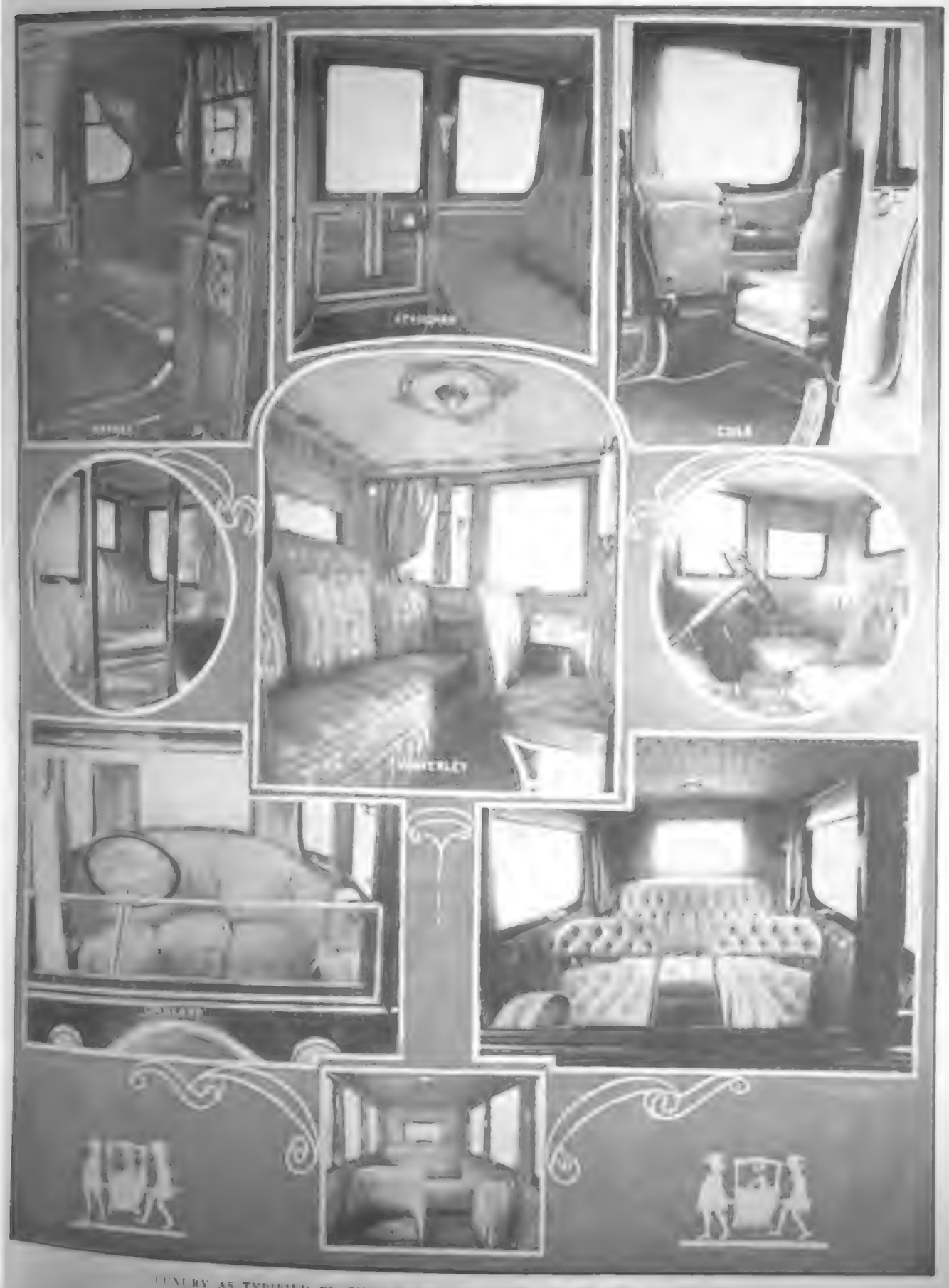
Debut of the Stearns-Knight "Six."

It's a good bet you never heard of a Stearns-Knight "six." Didn't think there was such a thing, did you? Neither did a whole lot of other persons, but there is the car, nevertheless. It's making its debut at the show. It has the very same white line on the radiator that has marked all Stearns cars for a good many years. That's one way you can always identify it. And, of course, it is one of the very few six-cylinder Knight engines on the American market—or any other market, for that matter.

Does it differ very much from the Stearns-Knight "four"? No, it is so much like it that you can scarcely tell them apart, except for the fact that they have not the same number of cylinders. "Four" looks just the same, you say? Of course it does, for the only changes that have been made in it are minor ones. The magneto is a Mea, for instance, and the design of the steering gear casing has been altered a little bit to make it stronger. The bodies have been changed considerably, however, and quite naturally they are better looking than ever before.

Here's a difference between the "four" and the "six," though it is a small one: The front of the "six" motor is supported on a steel arch which, in turn, is bolted to the side frames. It replaces the usual aluminum arms from the crankcase. Also, a separate cross frame member at the front braces the frame and serves as a radiator mounting. Notice that the member can be removed with the radiator, leaving the whole front of the engine exposed for inspection. The clutch is the same as that used in the "four," and a four-speed selective gearset is used. New models? All the "sixes" are new, of course, and among the

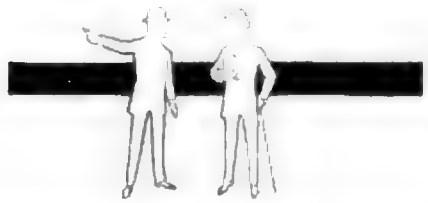
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LUXURY AS TYPIFIED BY THE DESIGN AND UPHOLSTERY OF CLOSED CARS

"fours" a new seven-passenger touring model has been added.

The Speedwell over there is another brand new "six." It's new all the way

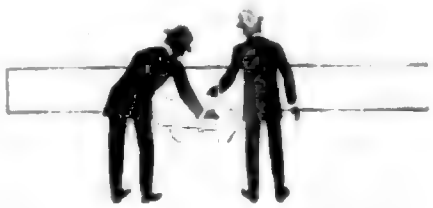


through and has very few features in common with previous Speedwells. Beginning to think there are quite a lot of new "sixes" after all? Take a look at that new six-cylinder Speedwell motor, with its L-head cylinders cast in blocks of three each. Pretty clean design, don't you think? Plenty of power, too; the cylinders measure 4⅛ x 5¼, and it is not the least bit difficult to get anywhere from 57 to 60 horsepower out of it. Notice the way the dry multiple disk clutch and the three-speed gearset are mounted in a unit with the motor and the substantial way the whole assembly is mounted in the frame. The model differs primarily from previous models in that it has a six-cylinder motor, of course, though another difference is in the three-quarter elliptic rear springs, the drop in the frame, the pressure-fed fuel supply and the completely enclosed construction. What say? Were other Speedwell driven from the left? No, this is the first of its kind to have the steering wheel at the left with the control levers in the center. It's equipped with an electric lighting and engine starting system, too, at the list price of $2,850 for a five-passenger touring car.

That bunch of cars over there with the gently tapered hoods and concave skuttle dashes are the Stevens-Duryeas. No wonder you scarcely recognized them, for they have been gone over with a fine-toothed comb and every little thing that does not harmonize combed out. Cast your eye over those new bodies. Beauties, aren't they? Not a thing outside to mar their clean appearance. Larger than the older bodies? Quite a bit larger, and there has been a corresponding increase in the size of the motor. So far, only one chassis is listed. It mounts a motor with L-head, pair-cast cylinders measuring 4⅝ x 5½, and, of course, the unit power plant supported at three points, which always has been a Stevens-Duryea feature, is retained. The dry multiple disk clutch is retained, also, as is the three-speed gearset with the distinctive method of mounting the gear shift lever. Very little change in these parts, but in the chassis proper a general enlargement is apparent. The wheelbase has been lengthened and a new method of hanging the rear springs adopted. They are below the axles now and consequently the body is quite a little bit lower. Electric lighting system? Of course; the Adlake system is standard equipment. Price of the seven-passenger touring car? $4,750. They're all styled Model "C-six," by the way, to distinguish them from their predecessors.

Another six-cylinder Knight engine? Yes, and it's the only other one. Only two made in America, you know, and as you've already seen the Stearns, this must be the Stoddard-Dayton. Not that you would have any particular difficulty in identifying it, for you can tell it almost anywhere by the left drive and center control. Also, notice the tool boxes under the running boards; they're another distinguishing mark. Other cars use them, too, you say? Yes, but they're not such big cars as the Stoddard.

Changes? None that amount to very much. There's a new I-beam front axle, for instance, that is very much like the axle used in Columbia cars, which, as you know, also are produced by the United States Mo-

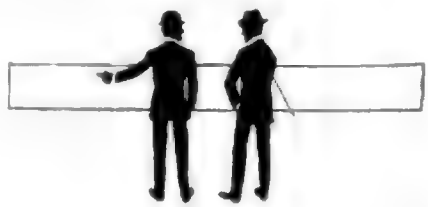


tor Co. and which also have Knight motor—that is, some of them have. But to get back to the Stoddard-Dayton, the steering gear also has been improved and now is of the worm and sector type mounted on roller bearings. Radiator larger? Don't know how you guessed it, for there has been so little increase that it scarcely can be detected without a measure. The fenders also have been altered slightly. Notice how much better they hug the wheels and how much better the lines are? Now, if you had said the bodies look larger you would have been nearer right, for there has been a substantial increase in size; there's a great deal more room in them now. Also, take note of the way the electric side lamps have been set into the dash. Any other Stoddards? Oh, yes; there are three four-cylinder poppet valve engined models right behind you—the "30," the "38" and the "48." No, they have not been changed even a little bit, as far as their mechanical construction goes. Their bodies have been renned, however, and little finishing touches put here and there.

Here we have the sturdy Stutz family; the "four" is the car that made good in a day on the Indianapolis track two years ago and has been making good in the hands of owners ever since, and the "six" is brand new, of course. But it retains all the Stutz characteristics, with emphasis on the rear axle system around which the car is built. Get down and take a look at that rear axle. Notice the sturdy way it is built, the compact gear case. You can see that the "six" axle is slightly larger than the axle in the "four," though it is exactly the same design. One of the features of the axle is that the outer ends of the axle shafts are carried in large annular bearings, construction which is common to the best of American and foreign cars, if you don't know it. Yes, the smaller Stutz is pretty much the same as it was before. The intake manifold has been water jacketed to ensure a more homogeneous mixture of the gas, the wheelbase has been increased about four inches, and that's about all. Price? The roadster lists at $2,250 and the six-passenger touring car at $2,300.

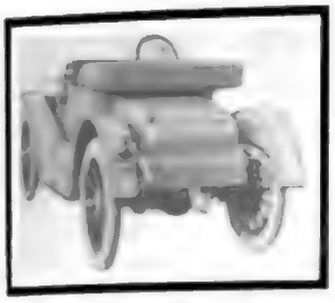
Here's another new "six" that you probably haven't heard much about. It's the Warren, and it's brand, spanking new. The manufacturers style it a "specialized" automobile for the reason that most of it is made up of parts which come from the factories of specialists. The Bosch magneto, for instance; Timken and Hyatt and R. I. V. bearings, Spicer joints, Gemmer steering gear—all these parts enter into the Warren cars, both the "four" and the "six."

The motor? Lift up the hood and glimpse the motor, with its L-head cylinders. One of the things that ought to be impressed upon you by a look at the chassis is the simplicity of the make-up. Notice the way the brake rods are fastened to the cranks on the rear axle. Pretty neat? Nothing that could be left off has been put on, and the result is that the chassis looks unusually "clean." The motor measures 4 x 5 and there are two "fours" mounting motors measuring 4¼ x 4¾ and 4⅛ x 4½. Plenty of variety in that line, isn't there? Changes? Not in the "six," of course, for it is new all the way through. Nothing to speak of in the "fours," either, now that you mention it. No, original construction has proved quite good enough. There has been refinement, of course; that is to be expected, but there has been no radical change.



Now, let's go over and take a look at the White family. They're all equipped with block motors, from the little four-cylinder 30-horsepower model right up to the six-cylinder model, which means the four-cylin-

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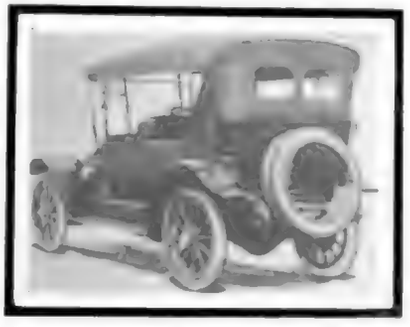
A 30 HEADED SOUTH

. . . well. You ought to take a good . . . ex cylinder block-casting, for it . . . at the shows—barring the . . . Notice the clever way the . . . generator—it is also the . . . mounted and the way it . . . silent" chain from the pump . . . it work? You just have . . . that's all. When you want . . . more a little controller . . . on the dash. That con- . . . with the motor and starts . . . Just as soon as it . . . becomes a generator and . . . charge battery. Nothing else . . . supply of "juice" for all the . . . and some to spare.

. . . ter and lighter on the smaller . . . only is, though this is the . . . found a place on them . . . "30," the baby of the line. . . . and starting system. An- . . . about the Whites that is new . . . is all driven from the left side . . . the Whites except the "30" . . . driven from the left side; . . . the "30" has had its steering . . . Any other changes, you ask? . . . portance; the bodies have . . . a little roomier and the upholst- . . . made a little more luxurious, . . . all.

. . . to one of the oldest . . . all, and if you look over . . . you will find that one . . . interesting things about it is a . . . mal features that have been . . . from the first, when Win- . . . cars went by the board . . . decided to make "sixes" exclu- . . . There is very little that is new, . . . chassis is none the less interest- . . . the air starter, for instance. It . . . the same form as when it . . . That's a pretty good tes- . . . is worth, don't you think? No- . . . what the cylinders appear. Not . . . superfluous material. Yes, . . . been of the L-head type . . . We have felt the rehning . . . and can see that for yourself. The . . . better throughout, the fenders fit . . . and there is less angularity at hood and cowl. The upholstery also has been improved materially, and three-quarter elliptic springs now are used at the rear.

Tired of looking at so many "sixes," you say? Hadn't ought to be, for they're nearly all new and they're interesting, if for no other reason. But let's switch over to the "fours" for a while. Take this bunch over here, for instance—Maxwell, Krit, Buick, Hupmobile, R. C. H., Detroiter, Metz, Little, Regal, Overland, Studebaker, Empire—you can buy any one of them for less than $1,000, and mighty good value, at that. Look at that little Metz. Wouldn't think it sold for as low as $395, would you? But it does, all right; and, what is more to the point, it is fully equipped at that price. What makes it so quiet? Well, one reason is that there are no gears in it. It has a friction transmission, it's as smooth as silk



STEARNS KNIGHT REAR

and not any noisier, either. Another point—it has multiple disk brakes. Ever hear of them? They're right in the wheel hubs.

Studebaker and Little you have already looked at, though may not have noticed that the smallest Studebaker, there—the "25"—costs only $885. Noticed it, you say? Isn't it a great value? Look at the clean-cut engine and the roomy body with the well-blended lines. And make a note of the fact, too, that it is fully equipped.

Take a slant at the Detroiter, there. Which one is it? The one with the white band around the top of the body. Adds quite a touch of distinction, doesn't it? Now lift up the hood and notice the compact unit power plant and the neat gear shifting arrangement with its lever terminating in a plain knob. Pretty compact design, eh? Look at the way the magneto is driven from the timing gears at the flywheel end of the engine instead of at the front end. Yes, that's one of its distinctive features. Nine hundred dollars is the price of the five-passenger car, and it includes full equipment, too.

Those cars over there with the squarish radiators and hoods are the R. C. H. family. Look quite British, don't they? Sure! they're in the low-priced group; you can buy that touring car for $900, and there is plenty of room for five persons in it, too. Ever notice what a long-stroke engine the R. C. H. car has? It measures $3\frac{1}{4}$ x 5, and all the cylinders are cast in a single block that is beaten by few for neatness and simplicity. What power? Twenty-five horsepower, she pulls, and quite easily, too. The long stroke is responsible for that. Yes, they make a roadster. Classy looking little car, too, and the price is the same as for the touring car—$900.

Here's another little car that is a big one in reality—the Hupmobile. Remember when it first made its appearance in its present form last show-time? Well, it is just the same now. Price has gone up a little, it is true, but then look at the extra equipment you get. Still, the car sells for $25 less than $1,000. Ever notice that Hup engine with the magneto mounted over the flywheel and driven by a "silent" chain? And take a look at the dash arrangement, with the spark coil and the throttle and carburetter air levers on a cowl dash. The Hup was one of the first to bring out a dash of this type. What makes the cowl so deep? That's because the gasolene tank is in it. Makes a steady flow of gasolene to the carburetter sure. No need for pressure feed. Make a note, too, that the steering gear is at the left side, with the gear shift lever in the center.

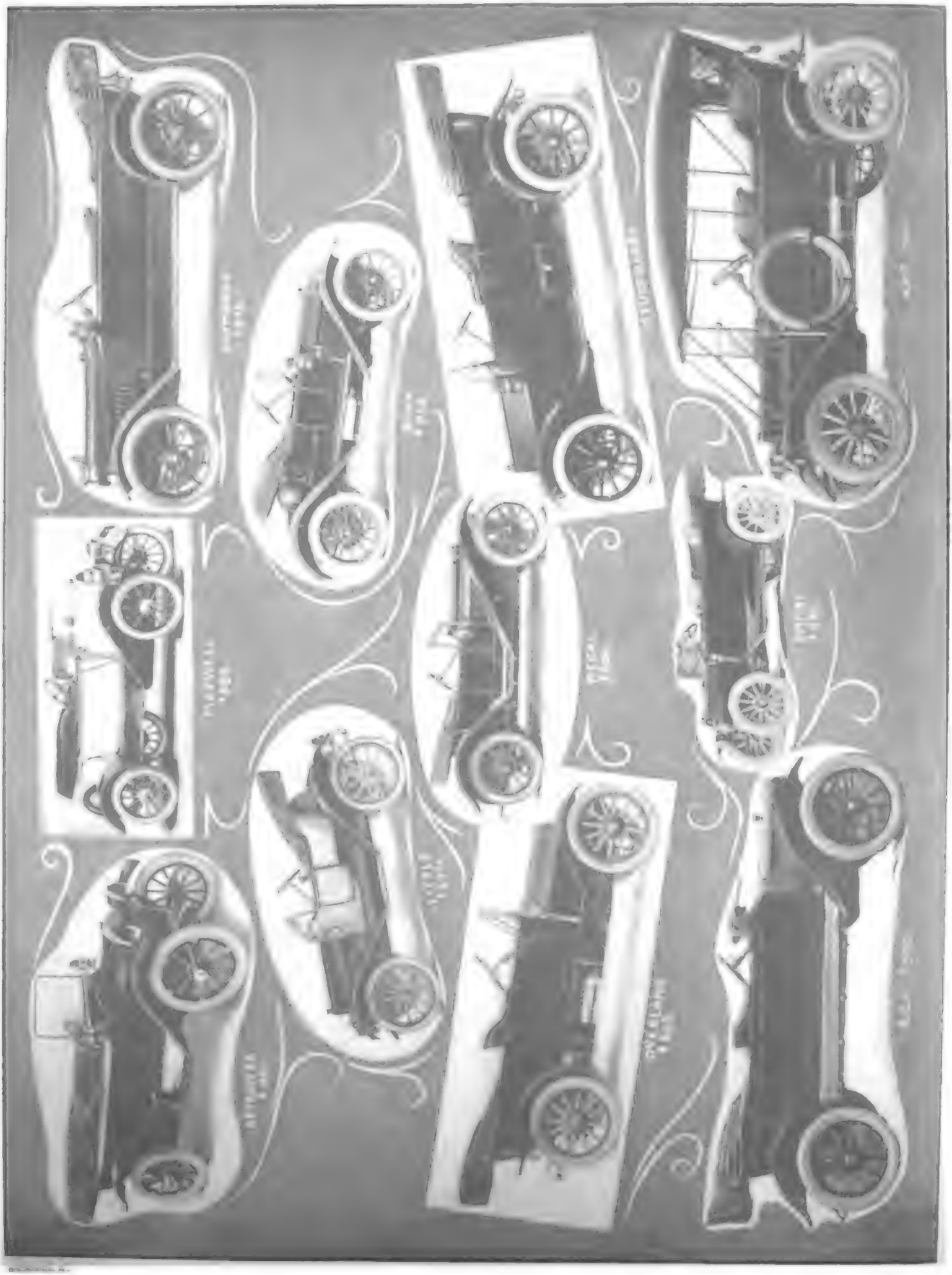
This car here is the Krit—another classy looking little machine that lists at considerably less than $1,000. Sells for only $[illegible] and, of course, it is fully equipped. This is another car that has an unusually attractive unit power plant. Notice how the oil filler pipe, for instance, is in the flywheel housing and the way the hot air intake to the carburetter is arranged. Look at the chassis over there and notice that the rear springs are full elliptic to give the greatest possible resiliency. Yes, it's driven from the left side and the control levers are in the center.

Here's the Empire. It sells for $950, though you might think it cost a whole



ALCO "MARINE" WINDOWS

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...to-be. Another low-priced car with a ...-appearing unit power plant rated at ...-horsepower. Long-stroke motor? Of ...se the long-stroke motor's the thing ...year, if it ever was. Take a look at ...Empire rear construction. It's sturdy, ...as you could only see inside of it you ...don't have to wonder why it wears so ...and runs so quietly. It's mounted on ...finest roller bearings. No, only the ...model is made—a five-passenger tour-...

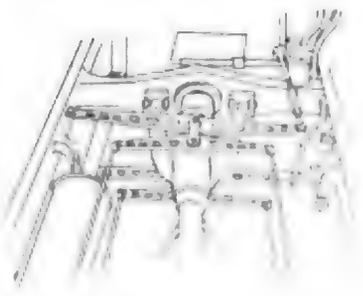
Variety Found in Regal Line.

...get very low cars over there? They ...the Regals. Surely you know the ...Regal. O, that one that's not ...low as the others? That's a new ...that has just been brought out. The ...axles hung beneath the axles, and ...the body is not quite as low as the ...it still is pretty low. That under-...hung car there sells for $950. Cer-...has a long-stroke motor—meas-...3½ x 4½. One of the beauties ...Regal line is that there is such vari-...Both underslung and overslung, and ...them is high priced enough to take ...the real low-priced class.

...Buick line over there is another that ...ically complete—cars that range in ...the way from $950 up to $1,650. ...the $950 car? It's that roadster ...gasolene tank behind the seats. ...have not been many alterations ...the Buick line, unless the addition ...new model can be called a change. ...the new one, there—the "40." It ...$1,650, and it's fully equipped, too. ...attractive in the Buicks? Well, ...for instance. It's the very same ...that always has been used, with the ...inhead, which location permits a ...symmetrical combustion chamber ...which increases efficiency. That's ...you can always get so much more ...power of a Buick motor than you ex-...to soon get to expect it, though, for ...there it is there if you want it.

Maxwell Adds 22-Horsepower Model.

...Maxwell is the only one left in that par-...ular less than $1,000 group"? Pretty ...—although there may be one or two ...the ball somewhere. Take a good ...at that little 22-horsepower Maxwell, ...instance. Never saw it before? Noth-...funny about that, either, because ...new. Never shown before? Yes, it ...very much like the other Maxwells. It ...the same distinctive unit power plant ...the same left hand drive with centrally ...geared gear shift lever. Price? It sells ...$745 and it's very near the bottom of ...price ladder, too. Of course, it is ...equipped just the same as all the other

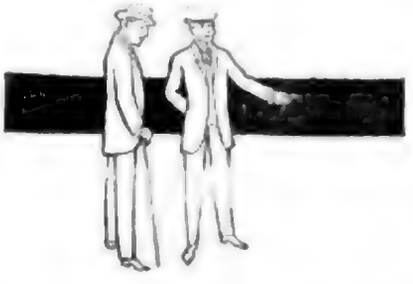


CUTTING BRAKE EQUALIZERS

Maxwell cars are. Others? Sure! There's the "30" and the "40"—both of them four-cylinder models selling at comparatively low prices and both retaining all the marks that serve to make the Maxwell distinctive.

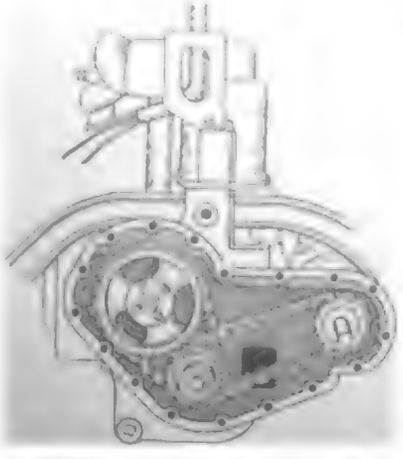
Only Stroke-Bore Ratio Remarkable.

And glimpse that Only car over there. It is the car with the really remarkable stroke-to-bore ratio. Cylinders measure no less than 4¼ x 7⅞. Think of it—nearly twice as much bore as stroke! Another distinctive



feature of the car is the straight-line drive and the low-hung appearance. The long-stroke motor gives considerable flexibility, it is claimed, to say nothing of the fact that 30 miles to the gallon of fuel and 75 miles an hour both are guaranteed by the manufacturers.

Nationals? Sure, they're right behind you—that classy looking bunch of cars with



CADILLAC CAMSHAFT DRIVE

their steering gears at the left. New models? Certainly. That's a new one, that "Speedway" roadster, there. Looks as if it had plenty of speed, doesn't it? Before you leave the Nationals, notice the way the power tire pump is mounted at the front end of the crankcase casting and the way it is driven from the timing gears. There's a positive clutch there now instead of the friction clutch used in the past. What's the motor? T-head, of course, with the cylinders cast in pairs and measuring 4⅝ x 6; no trouble to develop 40 horsepower with those cylinders, and yet that is all they are rated. Prices? All the way from $2,750 to $3,000.

An American Underslung Limousine

Here are some more under-hung cars—a whole line of them, from a clever little roadster right up to a full-sized underslung limousine. Never saw an underslung limousine. Probably no one else ever did either until these Americans put in an appearance. Take a slant at the distinctive lines at the backs of those limousines. Look almost submarine, as well as limousine, don't they? But, then, the American company always did have a way of bringing out distinctive-appearing cars that it was the despair of others to copy. Conventional cars in the American line? Surely; there's the "Traveler" for instance. It has its frame above the axles, and it is fitted with an uncommonly good-looking six-passenger body. Price? They're asking $6,000 for the new underslung limousine, there, the one that accommodates six persons, and $4,500 for the "Traveler." The little one there? That's the Scout model, and it sells for as little as $1,475. One of the things you want to notice in the American line is the straight-line drive that is obtained.

One More in Abbott-Detroit Family

Anything new in the Abbott-Detroits? Of course there is. That small car, there, is new all the way through. No, it is not a revision of the previous small car; it is altogether different—it's new. Notice, in the first place, that the smaller models and the larger ones are mechanical duplicates. Both have long-stroke Continental motors, and they're both equipped with electric lighting and starting systems. Now, get down and take a look at the way the springs are hung beneath the axles. That makes for greater stability. Make note of the fact, also, that all the bodies have been enlarged; there's more room in them now than there ever was, and no one ever was crowded in an Abbott-Detroit.

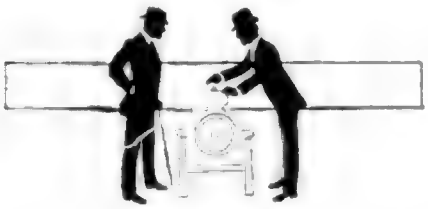
Here are a couple of new models that have been added to the Auburn line—a new "four" and a new "six." Both of them have long-stroke motors quite as a matter

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of course, the "six" cylinders measuring 3¼ x 5¼ and the "four" measuring 4¼ x 4¾. No, the new four has a block motor and the "six" is cast in pairs. Other Auburns? Of course there are; there is the 40-horsepower four-cylinder model and the six-cylinder "50." Changes? Scarcely one, though a few refinements have been made, of course.

Little Room for Improving Bergdoll.

And now we come to the Bergdolls—the "30" and the "40"—both having four-cylinder motors which give evidence of careful designing. Also there is a new "40" with a long-stroke motor and a four-speed gearset, though otherwise it is much like the older "40" that already has been increased slightly, and they have a longer hood to make room for the U. S. L. electric lighting and engine starting system with which they are equipped. No, the "30" is in just about its original form. Little room for improvement could be found.



Remember when the Cadillac first came out with the Delco electric lighting and engine starting system? Well, there's the latest Cadillac over there, and you will still find the Delco system on it. It has been refined, of course, and made still more automatic. Also, the engine has been increased in size and now is rated at 40-50 horsepower; the copper water-jackets are retained but the timing gears have given away to a "silent" chain. Incidentally, the wheelbase has been lengthened and a whole raft of other minor refinements have been made, not the least important of which is to be found in the increase in tire sizes. How much does the touring car sell for? Completely equipped it lists at the reasonable price of $1,975.

Cunningham, Too, Remains Unchanged.

That car there with the hood up, showing the distinctive enclosed overhead valve mechanism, is the Cunningham. Saw it in New York last year? Guess again! You may have seen it in Chicago—most likely you did—but not in New York. And if you did see it in Chicago, or anywhere else, last year you ought to recognize it quite easily, for it has scarcely been changed a bit. Does not have to be changed, if you ask the Cunningham engineers why. And it is a pretty good reason, too. Bodies, of course, have been refined and the upholstery has been given the touch that makes for greater comfort.

Cutting cars, made by the Clarke-Carter Automobile Co.? Not by a long shot, they're not. If you read the trade papers you would know that the name of the company became Cutting Motor Car Co. a little while ago. What's that got to do with the cars? O, not so very much, only it shows that the makers are proud enough of their products to want to exploit its name coming and going, so to speak. But to get down to brass tacks, you want to take a look at the new Cutting unit power plants. Also make a note of the fact that a substantial increase in power has been made and that the wheelbases have been considerably lengthened. Tires are bigger, too, and so are the bodies.

Case Refines and Adds to Line.

Here's a new model Case that ought to draw your attention. Model X, it is called, and it is new all the way through. Doesn't take much delving to discover, however, that it has all the Case earmarks. Look at the gearset and the rear axle and the steering gear. Wouldn't you think they belonged to a much more expensive car? Haven't mentioned the price? Beg pardon; it sells for $1,500. Complete equipment, of course. Quite a few changes have been made in the larger car. Wheelbase longer, tires larger, Westinghouse electric lighting system installed, gasolene tank put close to the rear axle, new windshield. All these are new features.

Back to Columbia cars again. Well, well! Remember, we just glanced at them some time ago. Sure! Those are the Columbia-Knight models with the left-hand drive, and these with the right-hand drive are the poppet valve Columbias. Any changes in construction? None that are noticeable, though it is fair to assume that a big company like the United States Motor Co. surely would find a few small things to make better. Ever notice the way the generator is mounted on the Columbias—down on the gearset? It is protected in that position, though it is quite accessible.

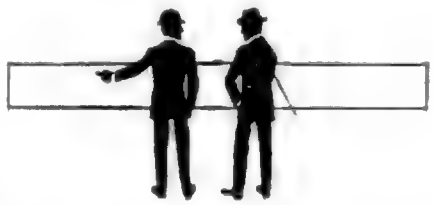
Cartercar Keeps Friction Drive.

Here's another unusual car. It's the Cartercar, and it is one of the few friction driven cars in the shows. See that big rotating plate that looks like a flywheel? Well, the other one, there—the one that is set transversely to it—is brought up against it and the friction between the two is sufficient to transmit all the power of the motor to the road wheels. Does away with gears which might or might not be noisy. Sure! Merely by shifting the driven disk you can get an almost unlimited number of speeds. That long case? That's the case the transmission chain runs in. It is a "silent" chain and it runs in oil, thus practically eliminating wear. Notice that the gasolene tank is located on the chassis. It's a little point, but it makes for greater stability.

Crow List Includes Two "Sixes."

Lift up the hood of that Crow-Elkhart there at your elbow and notice the compact six-cylinder motor, with its T-head cylinders cast in pairs, and then come back here and examine the dash and, in particular, the two little lockers in the seat riser that serve to house the tools and the batteries. Didn't know there was a Crow "six"? As a matter of fact, there are two of them—the "6-60" and the "6-50"—not to mention the four-cylinder 38-horsepower model. If you look closely at the older cars, you will notice the new front and rear axles, the larger brake drums, the heavier frames and reinforced spokes in the wheels. There are a host of other small refinements, too.

What is that other new underslung car

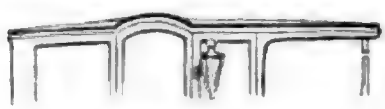


over there? It's a Colby, if you mean that low car with the rakish body, but it's not so new, after all. It was brought out last year and exhibited for the first time in Chicago. Thought you'd remember it. Looks pretty much the same, does it not? That's simply because you can't see all the little refinements that have been made in the motor and in the chassis. Many of them scarcely would be discernible, anyway, because they are in the materials.

Davis and Diamond T from West.

The Davis—that's it, the roadster over there with the turtle deck aft, to use a nautical expression—is another car that seldom gets to New York—at a show, that is. Of course, there are lots of them running around the streets, and maybe the reason they don't attract attention is because they are thoroughly orthodox in appearance. Nothing in the least bit freakish about them. Notice the motor, for instance. It's a Continental, block-cast motor, with all the valves on the one side and neatly encased. The gearset, if you notice, is arranged for center control, the arrangement being particularly simple. See the way the quadrant is bolted directly to the top of the gear case? Make note of the fact, also, that all the Davis cars have cowls that are a little longer this year than they were last year. That provides more protection for the occu-

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PIERCE



PACKARD



KNOX

...front seats. The Diamond T ... Western car that you don't often ... New York. It has a good reputation ... where it is built, however, and ... promise of spreading ... Last but North and South as well. ... car, right there. Take a good ... for a great many of these West... certainly are "comers," and you ... tell when the information will ... good stead.

Edwards Has Several Novel Points.

... a good new car that is fairly ... unusual features—Knight en... drive, Lanchester springs, are ... its features. Yes, you've ... it's the Edwards, built by ... Motor Car Co., of New York ... me over here and take a good ... rear springs, for they are the ... the kind in the shows. Notice



ABBOTT-DETROIT



WHITE



NATIONAL

... tools are attached, so as to ... play to the axle without re... resiliency or action of the ... get down and take a squint ... axle with its worm drive and ... substantial casing. Ever ... interesting features in a single car ... expensive car? Well, not so very ... when you consider the way the ... the equipment. The five-... touring car, for instance, lists ... yes! Don't forget to exam... lighting and engine starting ... U. S. L., and is completely ... the flywheel housing, where ... protected from dirt and mechan... Pretty neat?

Great Western Price Cut $265.

... Great Western car. Funny ... Great Western, but it's so ... ought to make the Great ... the greatest sellers on the ... was $1,850 last year; and what do you think they have done this year? Simply made the car a bigger car and a better one throughout, added a whole lot of equipment never listed before, and calmly lopped $265 off the price. Yes, it sells for $1,585 now. Kind of surprising, is it not? Lift up the hood and take a look at that motor. No trouble developing 40 horsepower with those cylinders. They measure 4¼ x 5½—long stroke, too, you see. Yes, it has a Presto engine starter this year that it did not have last year, and a Stewart speedometer and electric lights and an electric horn—altogether, the list is nearly as long as your arm. Sturdier axles, too, and a higher factor of safety everywhere.

See the wire-wheeled car over there—the one with the deep skuttle and the cowl dash? It's the Henderson, that was christened by the Mayor of Indianapolis last Decoration Day with a peck of new potatoes. Let's go over and "dig into" it. What's new? Why, it's all new; there is not an old thing in it. Notice the motor. It is a block casting and develops 44 horsepower. Then notice the rear system with the gear-set hung on the axle, practice that has made many a famous car famous. The steering wheel is at the left, you notice. Can't find the gear shift lever? No wonder. That's it—that little knob sticking up between the front seats. It certainly is out of the way of the driver, though it is easily within reach. Electric lights from a dynamo system, of course, and very nearly ever other convenience that the modern owner demands.

Wherein Haynes Has Been Bettered.

How do you know the Haynes? One good way to tell it is by the contracting hand clutch. Take out the floor boards of that Haynes there and examine the clutch; one of its features is that it can be adjusted quickly. Steel against steel now, though instead of steel against bronze. Now, take a look at the new Haynes electric lighting and engine starting system. Notice how the generator and the motor are separated, the former being above the frame and the latter beneath the frame. If one gets out of order that does not prevent the other being used. Another of the things that are new in the Haynes cars is the upholstery. It's 12 inches thick in the rear seats and nearly as thick in front. The new model L Haynes is a radical departure from previous practice. See the difference? It has an L-head motor, whereas Haynes cars always have had T-head motors in the past. The cylinders measure 4 ⅛ x 5½. The clutch and gearset are the same as in the other model. Incidentally, the new model has left-hand drive and center control.

Imperial Has Northeast System.

The Imperial, over there, is another car that has improved wonderfully in appearance in the last twelvemonth. Make note of the new straight-line bodies that are mounted on the four chassis in the line. Two of the models, the "44" and the "34," have the Northeast electric lighting and engine starting system for the first time this year, and a number of other alterations calculated to render smoother and easier the action of the cars have been made.

Inter-State's Far-Reaching Changes.

Didn't know there was an Inter State "six," either, eh? Well, there was none until now, but there it is. It's one of the few block-cast "sixes" in the shows. Dimensions? Cylinders measure 4 x 5 and the motor is rated at 45 horsepower. The whole car is quite different from any of the other Inter-States. It has left drive with center control, for instance, and a four-speed gearset. Price? Twenty-seven fifty, with complete equipment, which also means an electric lighting and engine starting system.

Not a Jackson—that car with the V-type



KISSELKAR



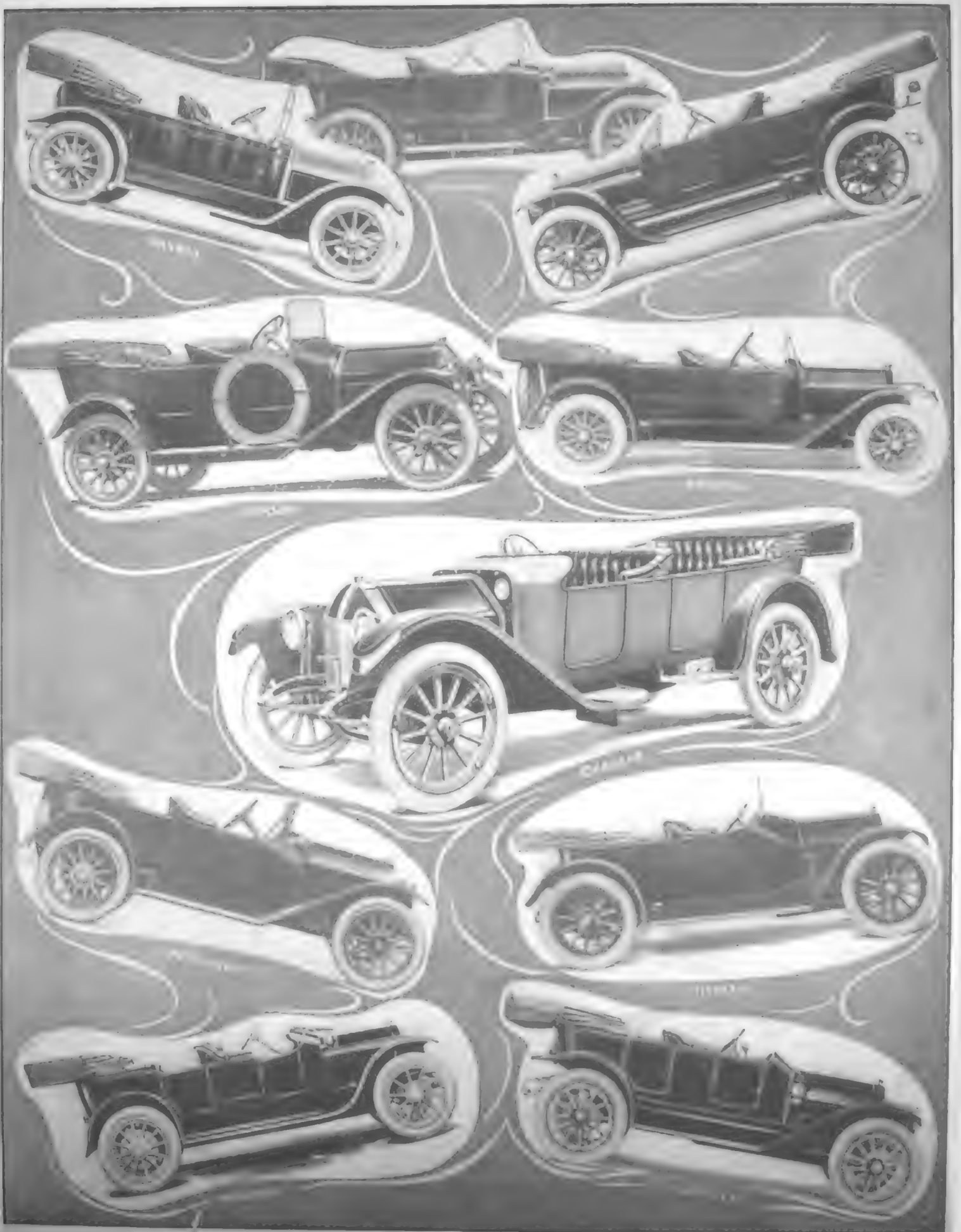
ALCO



GARFORD

LINES IN LIMOUSINE TOPS SHOWING VARIETY OBTAINABLE IN DESIGN

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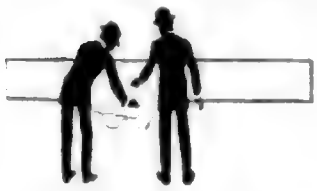
SOME OF THE "FOURS" WHICH PROVE THAT "SIXES" HAVE NOT MONOPOLIZED THE IMPROVING HAND

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radiator. Of course it is, though it is a Jackson you never saw before. It is a new one. The Jackson line has been most thoroughly reconstructed, you would hardly recognize it now. There is a Jackson "six" now, too. That's the one, there; it is styled to "sedanize" left up the hood and glimpse the pair-cast cylinders and the clutch and gearset, coupled in a unit with the motor. Cylinders measure 4½ x 4¼, and the engine is rated at 55 horsepower. Notice, also, the position of the electric lighting and engine starting system. Yes, it's the first time the Jacksons have had one. Sure, the new "four" has the same system—that is to say, the Delco one has. Another of the little features that mean so much is that the gasoline tank is carried at the rear of the touring, with the fuel under pressure and fed to a gravity tank under the shroud.

Moline Models on One Chassis.

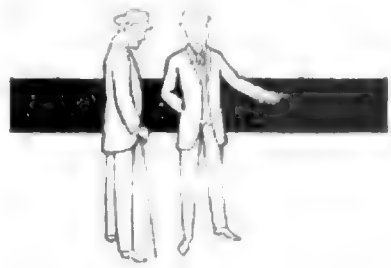
This is the Moline—the one to which the "Dreadnought" is added. No, there is only one chassis in the Moline line.



You can have your choice of several styles. Any change in construction? Yes. The wheelbase is 10 inches longer; the bore of the cylinders has been increased to 4 in., the stroke remaining 4½ inches, the brakes now measure 16 in. There is an auxiliary tank under the front seat, with the main tank in the cowl; the lighting and engine starting system has been added, demountable rims are offered, and there has been a number of "refinements."

Reconstruction by Michigan Makers.

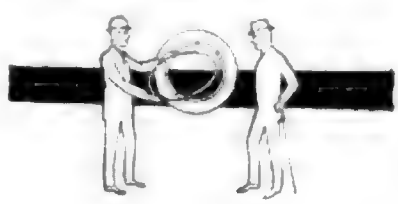
The Michigan one, just across the way here, is another line that has been most thoroughly reconstructed and appreciably increased in the reconstruction. About the most important of the changes which have been made is to be found in the gearset. It provides one more speed ahead now instead of three. Direct drive on third speed? No. Not by a long shot. Haven't you seen the long paper that Engineer Cameron prepared and published, setting forth the advantages of direct drive on fourth speed? Well, you ought to get it and read it. It is an education in itself. O, no! The Michigan fourth speed is direct drive, as the third, so don't make any mistake about it. Any other changes? Surely, here are. There is left drive and center control, for one thing; that's a radical departure from previous Michigan practice, as you probably know. Also, there has been a noteworthy increase in the size of the bodies, and the tires—in fact, the cars both are larger all over.



What's new in that group of Marions, over there? Not very much, it seems. The only material changes you can find are refinements—the use of a deep cowl over the dash, a lowering of the chassis, the use of new English steel springs, an increase in brake capacity and new brake cams, and an alteration in the throttle and spark levers, eliminating the ratchet devices. Oh, yes! An electric generator and complete lighting system has been added, and the cars are fitted with Bosch primers. Any new models? That roadster, over there, is a new one. It's pretty much like the "Bobcat," only it has been built to give the occupants a little more comfort and a little less speed. It's pretty speedy, though, at that. There are still fewer changes apparent in the Marathon line, over there. Yes, still making the three chassis they have had right along, and very little room for improvement has been found. Motors? They are 4 in. x 5½, 4½ x 4½, and 3½ x 4½.

Mercer Records Warrant No Change.

Come over and have a look at the newer series Mercers. How many chassis? Two—one with a 4½ x 5 motor and the other with a 4½ x 5 motor. Why have there been so few changes made? Haven't you followed the performance of the Mercer cars during the past year? If you had you would know that a car that can give such a good account of itself scarcely requires changing. It's a pretty good time to "let well enough alone," as the old proverb goes. What's new? Well, all the cars now have four-speed gearsets and an electric lighting and engine starting system is standard on all but the raceabout. Lighting and starting units are separate.



There have not been any extensive changes made in either the Moon or Midland cars, across the aisle. How many models of each? Well, there are three Moons and two Midlands. The Moons mount T-head motors, two "fours" and a "six." What, didn't you know there was a Moon "six," either? Well, you have learned a lot. Yes, the Moon "six" is rated at 65 horsepower and has its cylinders cast in pairs. Notice the rear axles on all the Moons. They're a special type—full-floating, of course. Also make a note of the fact that electric lighting and engine starting systems have been added. As for the Midlands, there's a "six" in that family, too. Cylinders measure 4 x 5 and the rating is 50 horsepower. Notice particularly that Midland motor suspension. See how it provides for a certain amount of frame weaving without danger of damage to the engine? That's one of the Midland features. Unit power



plants, of course, and you have already seen the three-point suspension.

Paige-Detroit Builds New Model.

There's a brand new Paige-Detroit over there that is totally different from any other Paige-Detroit you ever saw. What's different? Why, everything is different. The whole car is new from stem to stern. Notice the new unit power plant, for one thing, and the way the cam and pump shafts are driven by "silent" chain. Notice that the car is steered and controlled from the left side, after the approved fashion. Take a look at the cork-insert multiple disk clutch, the gearset, the full-floating rear axle, the Gray & Davis electric lighting and engine starting system and all the other fine points—and then wonder how it is possible to produce the car and sell it with complete equipment for $1,275. Get that—$1,275. The other Paige? Very little change in it. In fact, no changes whatsoever. The Pratt-Elkhart—don't confuse them with the Crow-Elkhart cars—line is another in which there has been found very little room for improvement. Yes, they're still continuing the three chassis, all three of them "fours." Bodies have been altered, of course, and they are roomier and better looking, thus speaking volumes for their greater value.

See that nifty-looking roadster with a projection like a dorsal fin on its after deck? Get up a little closer, and you can

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read the name on it—Pathfinder. That roadster and the Martha Washington coach are the two new models in the Pathfinder line this year. Did you notice the "boat-like" appearance of the roadster? That's where it gets is name, "Cruiser." Look at the graceful lines and the "midship cockpit," so to speak. Looks pretty comfortable, eh? No, there have not been any material alterations in the Pathfinder mechanical construction during the past year. Just a few refinements to bring them more thoroughly up to date. Any changes in the Paterson line, over there? None to speak of in either of the two chassis, though the equipment has been increased considerably. Yes, Deaco electric lighting is standard on that model 43 car; an electric starter is put on the same car, too; naturally it increases the price slightly. How much? Well, the 43 sells for $1,600, with electric lights, and for $1,685 with electric lights and electric starter, both.

Rambler Enlarges Its Equipment.

Those cars down the aisle with the distinctive appearing radiators? They're the Ramblers. How many? Well, there are several models, but they are all built on the one four-cylinder chassis. Lift up the hood and glimpse the distinctive separately-cast cylinders, though you won't have any way of telling that the stroke has been increased to five inches unless you ask the salesman. No, it is not in the catalog just yet. As a matter of fact, this is the first time it has been shown. Except that a U. S. L. electric lighting and engine starting system has been added as a regular equipment, few other alterations have been made. Oh, yes! the equipment is more complete. All the open cars now have a top, a wind-shield, and a speedometer that they did not have before. Very little change in the Reo, either, except that the bearings have been increased in size, as have the tires, and a few minor improvements have been made here and there.

The Staver, the Velie, the Selden, the S. G. V., the Westcott—in none of them have there been made any alterations of a startling nature. They are all cars that have been "well brought up," so to speak, and they never have required extensive corrections. Quite naturally, a number of smaller changes have been made, though it is doubtful if you could find them without a very diligent search. Velie cars, for instance, now all have the "silent" chain camshaft drive originally brought out on the smaller model last year. In the Westcott there have been no changes at all, though the "six" is a new car all the way through

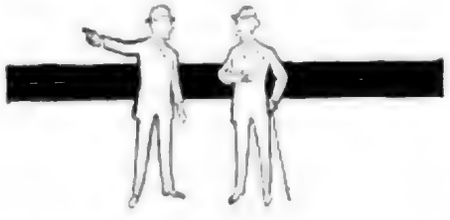
Guiding the Dealer Through the Realm of Electric Pleasure Cars

What's new in electrics? What's the biggest development of the year? In the fewest possible number of words it is: All seats facing forward. Practically without exception, every manufacturer of electric pleasure vehicles has either added a new model of the kind or redesigned an old one to meet that call. There is another development, but it isn't new: it simply has grown more conspicuous—the tendency to make the electric roadster, or any other kind of an electric car, look as much like "gasoleners" as possible. Cast your eye over that collection. Some of those cars almost smell of gasolene. But the tendency toward making all the seats face forward is the greater of the two, however.

"Clear Vision" a Detroit Feature.

Look at that Detroit "Clear Vision" brougham, for instance. It's a brand new model in which all the passengers face front. And here's another new Detroit, a little smaller than the other, in which all the passengers face forward. As you pass through the show you will notice the very same effect everywhere. By the way, have you ever looked at the direct shaft drive that is used in the Detroits? Get down there and look up at the shaft and the way it is bolted to the motor at one end and to the rear axle at the other. Not the slightest need for universal joints and, of course, none are used. Anything new in the Detroit line. Well, not very much that is apparent to the casual observer. For instance, there are a lot more drop-forgings used than in the earlier models and, of course, that reduces the weight. And all the cars have adjustable pedals, this year, too.

In the Broc electrics, across the way there, the front seats revolve so that the passengers may face in almost any direction, either forward or sideways, which ever they choose. How many models in the



Broc line? A Stanhope, which sells for $2,000, three broughams and a victoria. Pretty representative line, don't you think? What are the Broc engineers "strong" for? Suspension, principally, though every other part as well has been worked out with a great deal of care. But look at those three-quarter elliptic springs in the rear. Notice that the leaves are fairly thin. That makes the car ride easily when it is loaded lightly.

Wire Wheels on Buffalo Electric.

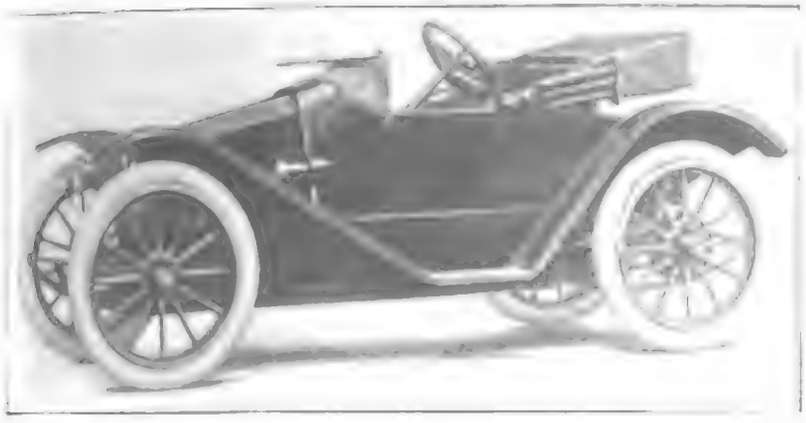
Speaking of "gasolenish" looking roadsters, just glimpse that Buffalo—the one with the wire wheels on it. Ever see a better resemblance to a gasolene car? It has wheel steer, tires at the side, and pretty nearly everything else that goes to make a gasolene roadster look the part. Are the wire wheels standard equipment? Optional—take 'em or leave 'em, just as you like, though most persons are likely to take them, because they add a touch of distinction to the car. There's a new shaft drive in that Buffalo you ought to see, and there are a number of other refinements that have been made, too. For instance, there is direct shaft drive with single reduction, foot control and three-point motor suspension. Makes the car a little bit more like a "gas" car, doesn't it? Any new models? Certainly. There is the vis-a-vis coupe, for instance, and the four- or five-passenger forward drive coupe. And there's a big bundle of energy and money behind those Buffalo cars, too.

Radiator Imitated on Woods Car.

Here's another electric roadster that looks distinctly "gasolency." It's the Woods. Notice the way the battery is carried up forward under a hood, just the same as a motor is carried in a gasolene car. Why has it a radiator? Radiator? Ha, ha! That may look like a radiator, but it isn't one just the same. It's merely painted to represent one. Notice the lines of the body, too, and the closeness with which they approximate the lines of the typical gasolene roadster. No, there have not been very many changes made in the Woods cars during the past year. As a matter of fact, none of the electric manufacturers has made any really extensive changes. If you will notice, designs appear to be fairly well standardized. Transmission of the Woods? Shaft drive? Of course; make a point of noting the motor suspension.

Come over here and take a look at the front control on the Argo. Isn't it simple? Nothing to it but one pedal. To start, you let the pedal come up; the higher up you let it come the faster the car travels. Then if you want to stop, all you have to do is to push the pedal down again. The action automatically turns off the power and at the same time applies the brakes. The motor in the Argo, notice, is mounted directly on the rear axle and forms a rigid unit with it. Another feature of the Argo is its long

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CHURCH-FIELD ELECTRIC ROADSTER WITH PLANETARY GEARSET



THREE-QUARTER FRONT VIEW OF STANDARD ELECTRIQUE COUPE



ARGO ROADSTER—AN ELECTRIC WITH "GASOLENISH" LINES

wheelbase—110 inches, in the case of the brougham.

Church-Field Has Planetary Gearset.

Ever see an electric car with a two-speed planetary gearset in it? No? Well, come over and take a look at this Church-Field. Not now, you say? Yes, it is; it's brand new. Never was anything like it before the Church-Field put in an appearance. What good is the gearset? Well, it permits the motor to "turn up" faster when the going is hard, and therefore it uses less current. Also, it is useful in climbing hills and in traffic work where it is necessary to drive very slowly. In combination with the controller you see, it gives 10 speeds. Get down on your hands and knees and see the way the gearset is mounted in a unit with the motor. And, while you are down there, notice that the frame of the car is underslung and that the rear springs are full-elliptic. There was a lot of brains put into that car. Is there a Church-Field roadster? Of course, there is. That's it over there. Small wonder you mistook it for a gasolene car what with that sloping "bonnet" and the wheel-steer and levers on the wheel. The Ohio is another electric that has a lot of original features all its own. Notice the motor suspension, for instance, and the way the drive chain is arranged. See how the whole unit virtually is mounted on a pivot so that it is free to move? And notice the neat little controller on top of the steering handle. Why is it so small? That's because it has very little work to do. The Ohio control is electric, you know. Yes, the fingers that make the battery connections are contained in a dirt-proof case on the chassis.

What say? All those cars over there can't be Borlands? Why not? Thought they were made only in one model? So they were up to a short time ago, but the way the line has grown would surprise you. There are no less than seven models now, not the least impressive of which is that limousine with the two seats outside for the driver and the "flunkey." Pretty big car for an electric, isn't it? Yes, it has a fairly long wheelbase—123 inches. Battery? It is 44 cells of 19-plate Exide, and it gives a speed of 25 miles an hour. The roadster beside it is another new model, and it looks a great deal like a "gas" car, too—doesn't it?

Those other cars over there are the Chicago electrics. They are newcomers, but the men who designed 'em are old in the business. Yes, both cars are Chicagoes—both the four-passenger car and the five-passenger clear-vision car. In the latter, you will notice, all the passengers face forward and the driver's vision is unobstructed. Batteries are equally divided front and rear, you can see. Why? Well, it gives a little

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better weight distribution, for one thing, and it makes them easier to handle.

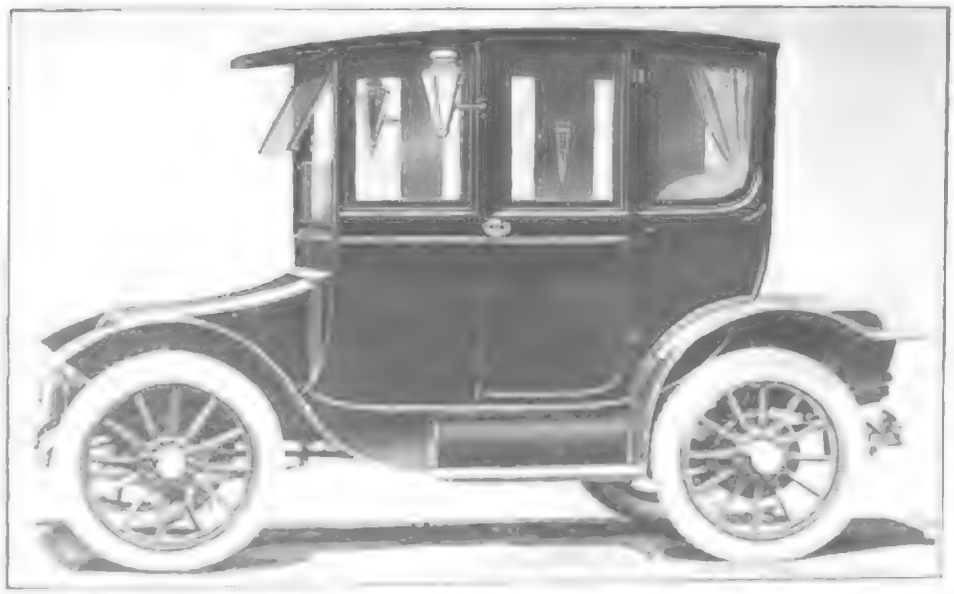
Come over here and take a slant at the Standard Electrique. Look at the chassis, there, and notice the way the motor is suspended in a trunnion and prevented from altering its relationship with the rear axle by means of those strut rods. Surely, the drive is by shaft to a double reduction gearing on the rear axle, which is a combination spur and bevel arrangement. No, it is not the only car that uses that particular reduction arrangement, but the other is a gasolene truck. Been using it for years, too. And, by the way, the Standard is one of the very few electric cars that sells for less than $2,000. The price? It sells for $1,885.

The Rauch & Lang cars, across the aisle, are pretty much the same as they always have been, as you can see with half an eye. New models? Yes, that's one, right there, and, as you can see, it's a model in which all the passengers face forward.

Here's another very "gasolenish" appearing electric roadster, the Waverley. No, you never saw it before, for the very good reason that it has only just been brought out. It's their model 90, and it is built right along the lines of the gasolene roadster, even to the incorporation of a folding top. While you're here, take a look at this other brand new Waverley model; it's quite different from anything else of its kind. How? Well, the lines are different in the first place. Notice the curved roof, for one thing. The principal difference, however, is in the seating arrangement. Open the door and notice the way the driver's seat and the corresponding seat at the opposite side are set slightly forward with a third seat between them, the three seats being, as the soldiers "in echelon."

Baker electrics? Of course they're here. You will find them at every show of importance. Anything new? Not very much in a mechanical way though the larger brougham there has a new method of hanging the transmission and mounting the motor. Notice the way the motor is attached to the forward end of a long tube which surrounds the drive shaft. The coupe there is a new model that makes its first appearance. Notice that all the seats face forward and the car is roomier and lower than most others. Take a slant at the limousine back of it, too. Yes, that one's equipped with lever steel, but you can have either lever or wheel. And don't overlook that semi-colonial top; it's designed so that water never will be shed down the sides of the car. Notice also, how low the front and front quarter windows are so as not to obstruct the driver's view.

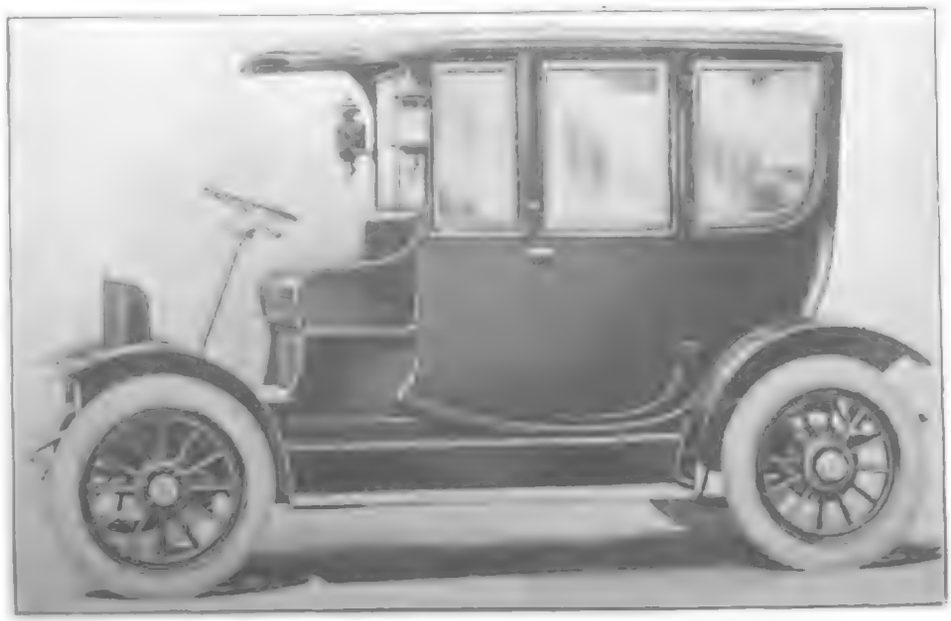
Accessories? Oh, there's an ocean of 'em. But you've seen enough to last you for a while. Where's the cafe? . . .



BAKER ELECTRIC BROUGHAM EQUIPPED WITH PNEUMATIC TIRES



WAVERLEY SHELTERED ROADSTER WITH "GASOLENE" TOP AND BONNET



LATEST TYPE RAUCH & LANG OUTSIDE DRIVEN ELECTRIC

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TABLOID REVIEW OF THE CARS TO BE EXHIBITED

Wherein Not Merely Their Prices and Principal Specifications Are Presented but Equipment, Improvements, and Selling Features Summarized as Never Before Crystalized Evidence that "More for the Money" is Obtainable than a Year Ago.

ABBOTT-DETROIT.

Abbott Motor Co., Detroit, Mich.

Models—[illegible] built on two chassis, the "44-50" and the other the "34-[illegible]" chassis has a pair cast L-[illegible] 4½ x 5½ inches, [illegible]-horsepower, dry multiple disk [illegible]-speed selective gearset, full-[illegible] axle; 121-inch wheelbase on [illegible] the smaller chassis is [illegible] except that the motor is [illegible] cylinders 4¼ x 5¼ and the [illegible] tires are 34 x 4.

Prices—[illegible] inclosed roadster, $2,150; [illegible], $1,975; seven-passen-[illegible] limousine, $3,050. "34-[illegible]ster, $1,700; five-passenger

Changes from Previous Construction—[illegible] car all the way through [illegible] a smaller edition of the [illegible]er, the changes are few [illegible] a refinement of the [illegible] of the springs [illegible] to 5 leaves below

Selling Points—[illegible] Continental L-head, long stroke [illegible] electric lighting and [illegible] system; dry multiple disk [illegible] gear shifting device; three-[illegible] seats; full-floating rear [illegible] axle case; heavy artillery [illegible] wheels; treated spokes; grease [illegible] spring bolts; drive taken [illegible] mounting spring shackling [illegible] cantilever spring construc-[illegible]; body: Turkish roll cush-[illegible] and tufted dash; piano [illegible] operations; pockets in all [illegible] tube radiator

Equipment—[illegible] complete, self-contained [illegible] incandescent starting system; [illegible] side curtains; rain [illegible] windshield; Stewart [illegible] lock combination; gaso-[illegible] electric lights, including [illegible] tire repair kit; Booth de-[illegible] horn and horn

ALCO

American Locomotive Co., New York.

Models—[illegible] models built on one six-[illegible] cylinders cast in pairs, [illegible] rated at 33-4 horsepower; [illegible] four-speed selective gear-[illegible] rear axle; 131½-inch wheel-[illegible] 4 front and 37 x 5 inch rear

Prices—Five- and seven-passenger touring, $6,000; Colonial limousine, $6,750; Berline limousine, $7,250.

Changes from Previous Construction—New type of clutch; universal joint between clutch and transmission; upper half of crankcase extended to rear of clutch; new type of fan; brake shoes divided in center to give two shoe effect; lower center of gravity; wider tonneau seats; wider doors; electric lighting system throughout; unobstructed running boards; three-quarter elliptic rear springs; Truffault-Hartford shock absorbers.

Selling Points—[illegible] straight line body effect; quality of upholstery; quality of metals; luxury of interior and exterior finish; appointments; illuminated step; electric searchlight on cowl; long life; silent operation of mechanical power; spontaneity and flexibility of motor; quick acting brakes, one piece rear axle housing; inside control

Equipment—Wind-shield; top with side curtains; illuminated Sears [illegible] meter; slip covers; electric lighting system; electric dome light in top, electrically illuminated step; Klaxon warning signal; trunk rack; foot rest; robe rail; invisible tool box filled with tools; tire brackets; Truffault-Hartford shock absorbers. The closed cars have electric dome light; Pullman lights in rear of tonneau; speaking tube; toilet cases

AMERICAN.

American Motors Co. Indianapolis, Ind.

Models—Eight models built on three four-cylinder chassis: American Traveller, American Tourist and American Scout. The Traveller chassis has an L-head pair-cast motor measuring 5⅛ x 5½ and rating 60 horsepower, cone clutch, four-speed selective gearset, full-floating rear axle, 140-inch wheelbase on 41 x 4" tires. The Tourist chassis has a T-head block motor measuring 4½ x 5 and rating 48 horsepower, inverted cone clutch, three-speed selective gearset, full-floating rear axle, 124-inch wheelbase on 34 x 4 tires. The Scout chassis has a T-head block motor measuring 4 x 5 inches and rating 30 horsepower, cone clutch, three-speed selective gearset, full-floating rear axle, 105-inch wheelbase on 36 x 3½ tires.

Prices—Traveller: Four-passenger touring, $4,250; six-passenger touring, $4,500; limousine, $6,000. Tourist: Four-passenger and roadster, $2,350. Scout: Roadster, $1,475; coupe, $2,000.

Changes from Previous Construction—All models remain substantially the same except the Scout in which the motor dimensions have been increased from 3½ x 5 to 4 x 5 inches.

Selling Points—Underslung construction, silent efficient motors, unit power plant in the Scout, large wheels, straight line drive, low center of gravity, long tire life, flexible semi-elliptic springs, selective sliding gearsets, unusually strong artillery wheels, grease cups internal with screw bolts, drive through torsion tube relieving springs, deep upholstery, hand buffed leather, full equipment including electric lighting systems on the two larger models, beautiful finish.

Equipment—On the Traveller, complete electric lighting and engine starting system top with envelope and side curtains, 5-00 x [illegible] non-skid tires, wind shield, demountable [illegible] with two extra rims, horn, jack and tool kit; Tourist has the same, except that a [illegible] replaces the electric starter, and the speedometer is a $50 instrument; on the extra Q. D. demountable rim is included. Scout equipment is the same as that listed for the Tourist.

BERGDOLL

Louis J. Bergdoll Motor Co., Philadelphia.

Models—Nine models built on three chassis, all being "fours." The standard 40-horsepower chassis has an L-head block motor, measuring 4 x 5 15-16 inches, multiple disk clutch, three-speed selective gearset, 115-inch wheelbase and 36 x 4 tires; the "Fairmount" 40 is the same, except that it has a four-speed gearset, with direct drive on third speed, and 124-inch wheelbase; the "30" has an L-head block motor measuring 4 x 4½ inches, three-speed selective gearset, multiple disk clutch, 115-inch wheelbase and 34 x 4 tires.

Prices—All "Fairmount" open types are listed at $2,000; standard "40's" at $1,800, the "30" sells for $1,600. In limousine form the three models list at $3,250, $2,600 and $2,400, respectively.

Changes from Previous Construction—The "Fairmount" model is new, though beyond the longer wheelbase and new bodies, it is mechanically identical with the "40" of last season. The standard "30" and "40" remain unchanged except that tire sizes in the case of the "30" have been increased from 3½ to 4 inches; metal bodies are used on the "30" instead of wooden ones.

Selling Points—Real long-stroke motor; four-speed gearset with direct on third; U-S-L electric engine starting and lighting

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system; Continental demountable rims; full-floating rear axle; Schwarz wheels; Bosch magneto; Schebler carburetter; honeycomb radiator; two Spicer universal joints; silicon springs; 10-inch upholstery; metal shell-back bodies.

Equipment—For the "30" and the standard "40": Top, windshield, tire irons, Prest-O-Lite tank, five lamps; tools and horn. For the "Fairmount" models: The same, including a complete dynamo electric lighting and engine starting system.

CHEVROLET.

Chevrolet Motor Co., Detroit, Mich.

Models—One model built on one six-cylinder chassis, the motor being of the T-head type cast in threes and measuring 3 9/16 x 5, rating 40 horsepower. Transmission elements include cone clutch, three-speed selective gearset and full-floating rear axle. Wheelbase is 120 inches on 36 x 4½ tires.

Price—Six-passenger touring car, $2,100.

Changes from Previous Construction—The car is new throughout.

Selling Points—Long-stroke motor cast in threes; unusual flexibility and lack of vibration, counterweighted crank-shaft. English system compressed air engine starter, dynamo electric lighting system, substantial frame, power-driven air compressor, three-quarter platform rear springs, liberal bearing surfaces, exhaust heated carburetter, leather-faced cone clutch, selective gearset, V-type radiator, distinctive appearance, low center of gravity, left drive with center control, special type emergency brake lever, superior finish, deep upholstery, complete equipment.

Equipment—Mohair top with envelope and side curtains, windshield, speedometer, demountable rims with one extra, dynamo electric lighting system, compressed air engine starter, power-driven air compressor, complete complement of tools, jack, horn, tire repair kit.

COLE.

Cole Motor Car Co., Indianapolis, Ind.

Models—Four models on three chassis each, two of which are "fours" and one is a "six." All employ pair-cast L-head motors, the "40" and the "50" measuring 4⅛ x 4½ and 4½ x 5½, respectively; the "six" measures 4⅛ x 4¾. All have cone clutches, three-speed selective gearsets and full-floating axles. Wheelbases are 116 for the "40" and 122 for the "50," both on 36 x 4 tires, and 132 for the "six" on 37 x 4½ tires.

Prices—Model "40," roadster or touring car, $1,685; model "50," open bodies, $1,985; coupe, $2,500; Berlin, $3,250. Model "60" (six), open bodies, $2,485; coupe, $3,000; cab side limousine, $3,750.

Changes from Previous Construction—Model 60, which is the "six," is new throughout and the alterations which have been made in the others apply principally to body refinements.

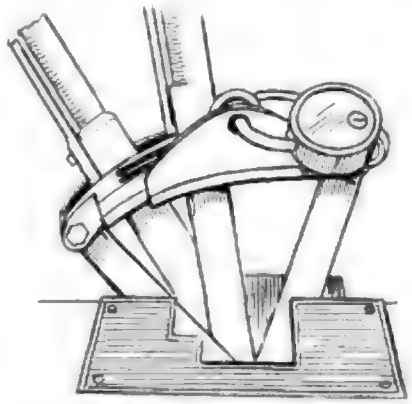
Selling Points—Northway unit power plant, working parts enclosed, Delco electric lighting, starting and ignition unit; Timken axles, Mayo cellular radiator, straight-line bodies with deep hand-buffed upholstery, large tonneau, pressure feed gasoline from rear tank, tire irons at rear of body.

Equipment—Delco ignition, lighting and starting system; silk mohair top with side curtains and dust envelope; clear-vision ventilating windshield, speedometer-gradometer, Firestone demountable quick-detachable rims with one extra; tools, horn, jack, pump and tire repair kit.

CHALMERS.

Chalmers Motor Co., Detroit, Mich.

Models—Six models on two chassis each, one chassis being a "four" and the other a "six." Both motors are of the L-head type



CHALMERS LEVER LOCK

and both measure 4¼ x 5½, the "four" having cylinders cast in pairs and the "six" having cylinders cast in threes. Both have multiple disk clutches running in oil and four-speed selectively operated gearsets. The wheelbases are: For the "30," 118 on 30 x 4 tires and for the "six," 130 inches on 30 x 4½ tires.

Prices—For the "4-30": Five-passenger touring, four-passenger torpedo and roadster, $1,950; seven-passenger touring, $2,150; coupe, $2,250; limousine, $3,250. For the "6-54": Five-passenger touring, four-passenger torpedo and road-ster, $2,400; seven-passenger touring, $2,500; coupe, $2,700; limousine, $3,700.

Changes from Previous Construction—A flange drive in the rear axles has been substituted for the crab drive used in the past; in the starting system, pressure now is obtained by means of a Kellogg four-cylinder air compressor; bodies are larger; cowls are deeper and mount the various dash accoutrements; the tillerboard between the body and the windshield has been eliminated; a complete Gray & Davis dynamo electric lighting system has been added.

Selling Points—Long stroke motor, four-speed gearset, smoke-preventing pistons, compressed air engine starter, large braking surface, metal bodies with 21 coats of paint; heat treated axles, Gray & Davis electric lighting system; pressure feed gasolene system, nickel-plated trimmings, Turkish cushions, long springs, silk mohair top, concealed door hinges and locks, power tire inflator, over-size tires.

Equipment—Gray & Davis electric lighting system, silk mohair top with side curtains and envelope, compressed air engine starter, Continental demountable rims, jewelled magnetic speedometer, power tire pump, gasolene pressure system, tire irons, floor covers, jack, tools, tire repair kit and horn.

CUNNINGHAM.

Jas. Cunningham & Son, Rochester, N. Y.

Models—Four models on one four-cylinder chassis. The motor is of the valve in the head type, with cylinders cast in pairs and measuring 4¾ x 5½; rated 40 horsepower; cone clutch with cork inserts, three-speed selective gearset, full-floating rear axle. Wheelbase is 124 inches on 36 x 4½ tires.

Prices—Roadster, $3,250; seven-passenger touring, $3,500; seven-passenger limousine, $4,500; seven-passenger landaulet, $4,500; seven-passenger Berline, $4,000.

Changes from Previous Construction—Left-hand steer with centrally located control levers; fuel tank and tire brackets located in rear. Other changes are slight, and tend to increase accessibility.

Selling Points—Long-stroke motor with offset cylinders, unit power plant, enclosed valves, self-contained electric starter and generator system, central control levers, full floating rear axle, roller bearing knuckle heads in front axle giving easy steering, long wheelbase, grease cups integral with spring bolts, individual body design, with concealed door hinges and handles, no screws on finishing mouldings, deep upholstering, special wind-shield, speedometer, gauges and all accessories mounted on filler board in plain view of the operator, clean running boards with tool box concealed in filler, battery slung underneath tonneau floor.

Equipment—Complete combined electric starter and generator, quick-detachable demountable rims, two spare rims, top with envelope, Warner speedometer, rain vision and ventilating windshield, electric lights in all lamps, tools and tire repair kit.

COLUMBIA.

Columbia Motor Car Co., Hartford, Conn.

Models—Eleven models on two four-cylinder chassis, one the Columbia Knight with sliding sleeve valve motor and the other the Cavalier with poppet valve motor. The Knight motor measures 4⅜ x 5½ and is rated 38 horsepower; transmission elements include multiple disk clutch, four-speed selective gearset and full-floating rear axle; wheelbase is 129 inches on 36 x 4½ inch tires. The Cavalier motor measures 4⅜ x 5½ and the transmission elements are the same, except that a cone clutch and a three-speed gearset are employed. The

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wheelbase is 128 inches on 36 x 4½ inch tires.

Prices—Knight models: Roadster, close coupled roadster, six- or seven-passenger touring, $4,500; limousine, $5,800; landaulet, $5,900. Cavalier models: Roadster or four-passenger touring, $3,300; six-passenger touring, $3,400; seven-passenger touring, $3,500; limousine, $4,800.

Changes from Previous Construction—None.

Selling Points—Knight motor; silent chain camshaft drive, bolted-on cylinder heads, large bearings, trough lubrication, Bosch ignition system, selective four-speed gearset with center control, silent full-floating rear axle, worm and sector steering gear with four roller bearings; 36-inch wheels, drop-forged hubs, dynamo electric lighting system, power driven tire pump.

Equipment—Mohair cape top with envelopes and side curtains, rain vision windshield, 4-inch dial speedometer, Gray & Davis dynamo electric lighting system, Truffault-Hartford shock absorbers; electric and bell horns, demountable rims with one extra and tire irons, power tire pump, trunk rack, rear storage hamper, set of repair and special tools. Roadsters—compartment trunk. Closed cars—Electric interior lighting, annunciator, speaking tube, dome light, clock, mirror, cigar lighter, bouquet holder.

CUTTING.

Cutting Motor Car Co., Jackson, Mich.

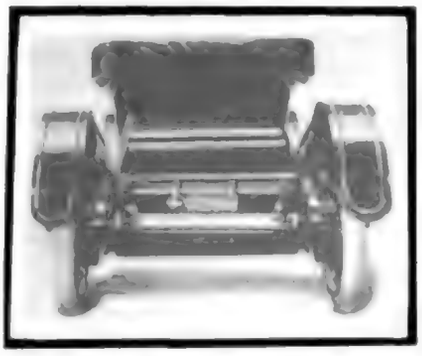
Models—Two models built on the same four-cylinder chassis, the motor being of the four-cylinder L-head type, measuring 4 x 5 and rating 40 horsepower. Transmission elements include 15-plate multiple disk clutch in unit with three-speed selective gearset and full-floating rear axle. Wheelbase is 120 inches on 36 x 4 tires.

Prices—Roadster, $1,475; five-passenger touring car with Hanna acetylene engine starter $1,475, with electric lighting and engine starting system both list at $1,625.

Changes from Previous Construction—Two-point plant supported at three points instead, wheelbase increased, roomier bodies, positive brake-equalizing system.

Selling Points—Price, 40 horsepower motor, 120-inch wheelbase, engine starter, electric lights, 15-plate disk clutch running in oil, housing of propeller shaft by double universal swivel torsion yoke, Westinghouse emergency brake system, heavy artillery wheels with 1¼-inch spokes, self-contained fuel feed oiling system, genuine square tube radiator in connection with the centrifugal pump, spring suspension, locking of all spring bolts in spring shackle so bolt operates in bushings of springs, concentrating wear directly on bushing instead of bolt and shackle; 10-inch upholstering, 36 x 4-inch tires, large roomy bodies.

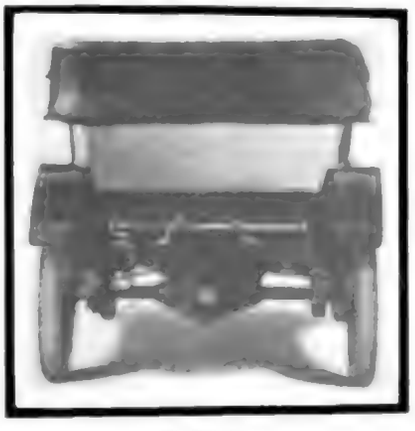
Equipment—Cutting mohair top, dust cover, side curtains; rain-vision windshield, Prest-O-Lite tank, demountable rims and extra rim, tire holders, Hanna gas starter, gas headlights, dash flash lighter, electric side and tail lights, robe rail, foot rail, horn, tools, pump, tire repair outfit, cocoa mat for tonneau.



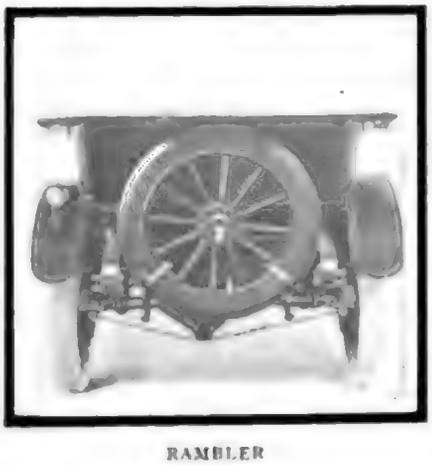
MITCHELL



HAYNES



REO II



RAMBLER

CADILLAC.

Cadillac Motor Car Co., Detroit, Mich.

Models—Seven models built on the same four-cylinder chassis. Motor has separately cast L-head cylinders measuring 4½ x 5¼ and rates 40-50 horsepower. Transmission elements include large cone clutch with special spring ring in flywheel, three-speed selective gearset and Timken full-floating rear axle. Wheelbase is 120 inches on 36 x 4½ tires.

Prices—Roadster, phaeton, four and five-passenger touring, $1,975; six-passenger touring, $2,075; coupe, $2,500; limousine, $3,250.

Changes from Previous Construction—Bore and stroke of motor increased, gears for camshaft drive replaced by "silent" chain, valves enclosed, new carburetter, automatic spark control adopted, wheelbase increased from 116 to 120 inches, Delco electric lighting, ignition and engine starting system perfected and made smaller, tires increased from 36 x 4 to 36 x 4½, top and windshield added to equipment.

Selling Points—Long-stroke motor with copper water jackets; "silent" chain camshaft drive, enclosed valves, longer wheelbase, lighting and ignition and starting system simplified and improved, automatic spark control, new carburetter, larger tires, accessible cone clutch, selective gearset, full-floating rear axle, three-quarter platform rear springs, deep upholstery.

Equipment—Cadillac mohair top with envelope and side curtains, rain vision, ventilating windshield, Delco electric lighting, engine starting and ignition system, 130 ampere-hour storage battery, Gray & Davis lamps, Hans gasolene gauge on dash, Warner speedometer, robe and foot rails, cocoa mat in all tonneau except closed cars, tools, tire repair kit, demountable rims with one extra, tire irons, pump, horn and jack.

CASE.

J. I. Case T. M. Co., Racine, Wis.

Models—Two models built on two four-cylinder chassis each. The smaller motor has block-cast L-head cylinders measuring 4⅛ x 5¼ and rating 30 horsepower, and the larger has pair-cast T-head cylinders measuring 4⅛ x 5¼ and rating 40 horsepower. The larger has a single disk and the smaller a multiple disk clutch, and both have three-speed selective gearsets and full-floating rear axles. Wheelbases are 115 for the smaller on 34 x 4 tires and 124 for the larger on 37 x 4½ tires.

Prices—40 horsepower: Roadster, $1,985; five-passenger touring, $2,050; seven-passenger touring, $2,400. 30 horsepower: Roadster, $1,435; five-passenger touring, $1,500.

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Changes from Previous Construction—The "40" is a new car throughout, and the changes in the smaller model are largely in the way of detail refinements.

Selling Points—Engine supported at four points, selective sliding gearset, disk clutches, full-floating rear axles, three-quarter elliptic rear springs, large tires, extra large diameter brakes, roller bearings in the wheels, nut and screw steering gear, central control on smaller model, right-hand control on the others; cowl-located gas tank in the smaller; electric lighting and engine starting systems; complete equipment.

Equipment—English mohair top with envelope and side curtains, rain vision windshield, complete electric lighting and engine starting system, demountable rims with one extra rim, complete set of tools, jack, tire repair kit, pump, and horn.

CROW.

Crow Motor Car Co., Elkhart, Ind.

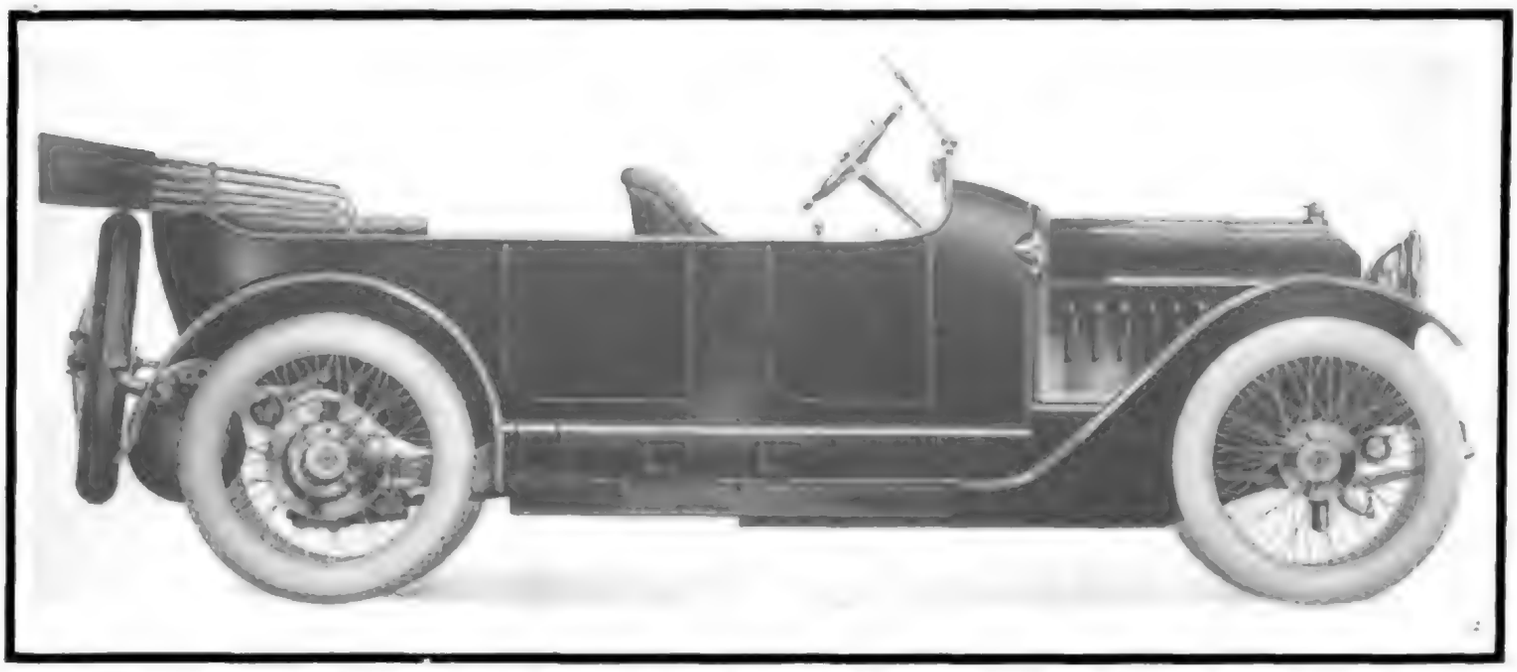
Models—Ten models built on four chassis,two of which are "fours" and two are "sixes." Both "sixes" have T-head, pair cast cylinders, the "55-60" measuring 4⅛ x 5¼ and the "45-50" measuring 3 1/9 x 5; of the "fours," the "35-40" has T-head, block-cast cylinders measuring 4⅛ x 5 and the "33" has L-head, pair-cast cylinders measuring 4 x 4½ inches. All have multiple disk clutches, three-speed selective gearsets and floating rear axles. Wheelbases are 130 inches for the "55-60," 122 inches for the "45-50," 114 inches for both the "35-40" and the "33."

Prices—(Comparative as listed in catalog) "55-60," seven-passenger touring, $3,000; "45," seven-passenger touring, $2,750-$3,000; "33," five-passenger touring car, $1,400-$1,500; "45," five-passenger touring, $2,250-$2,500; "45," roadster, $2,000; "35-40," five-passenger touring, $1,650-$1,750; "33," roadster, $1,400-$1,500.

Changes from Previous Construction—Both "sixes" are new throughout, and other than a few refinements no alterations have been made in the fours.

Selling Points—Quiet running motors, plenty of power, multiple disk clutch in oil, three-quarter and full-floating rear axles, six spokes in rear wheels bolted to hub flange, adding strength; "sixes" electrically lighted and started; long wheelbases, adequate braking surface.

Equipment—For the "fours": Mohair top with envelope and side curtains, Stewart speedometer, demountable rims, Prest-O-Lite tank, complete complement of tools and spare parts, jack, horn, pump, and tire repair kit. "Sixes" have, in addition, Deaco electric lighting system and Rexo electric horn.



EDWARDS KNIGHT FIVE-PASSENGER TOURING CAR WHICH HAS WORM DRIVE AND LANCHESTER SPRINGS

DAVIS.

George W. Davis Carriage Co., Richmond, Ind.

Models—Four models on two four-cylinder chassis. Both motors are L-head, the larger having pair cast cylinders measuring 4½ x 5½ and rating 50 horsepower, and the smaller having block-cast cylinders measuring 4⅛ x 5¼ and rating 40 horsepower. Both chassis have cone clutches, three-speed selective gearsets with center control and full-floating rear axles. Wheelbases 118 inches on 30 x 4 tires for both.

Prices — 40-horsepower, roadster, four- and five-passenger touring, $2,000; 50-horsepower five-passenger touring, $2,100.

Changes from Previous Construction—The 50-horsepower model is new throughout, though it is exactly similar to the older model except in size. The 40-horsepower model has not been changed except in minor details.

Selling Points—Continental long-stroke motors, large and strong gearsets with center control, heavy gears and shafting, imported Rhineland bearings, full-floating axles, three-quarter platform rear springs, complete Gray & Davis electric lighting and engine starting system, high tension magneto ignition, complete equipment.

Equipment—Best quality mohair top with envelope and side curtains, ventilated windshield, combination speedometer and clock, demountable rims, foot and robe rails, tire repair kit, tools, pump, jack, and horn.

EDWARDS-KNIGHT.

Edwards Motor Car Co., New York.

Models—Six models on one four-cylinder Knight engined chassis. Cylinders are cast in pairs and measure 4 x 5½, the rating being 25 horsepower. Transmission elements include dry multiple disk clutch, four-speed gearset and direct drive on third speed, full-floating rear axle with worm drive. The wheelbase is 120 inches on 4½-inch tires.

Prices—Roadster, speedster, four and five-passenger touring cars, $3,500; seven-passenger limousine and landaulet, $4,600 and $4,700, respectively.

Changes from Previous Construction—The car is new all the way through and is exhibited for the first time.

Selling Points—Knight type motor with new oiling system, unit dry multiple disk clutch and four-speed gearset in which third speed is direct drive, full-floating rear axle, worm drive, Lanchester rear springs, U. S. L. electric lighting and engine starting system completely enclosed, wire wheels standard equipment, center control with left drive, complete equipment.

Equipment—Golde "one man" top with envelope and side curtains, special one-piece adjustable windshield, specially designed

shock absorbers, U. S. L. electric lighting and engine starting system, robe and foot rails, speedometer, bulb and electric horn under hood, wire wheels, one extra wire wheel, quick-detachable rims, power tire pump, full set of tools, tire repair kit, hand pump and jack. Closed bodies have also electric dome and other interior lights, and toilet fittings.

HENDERSON.

Henderson Motor Car Co., Indianapolis, Ind.

Models—Two models, both built on the same four-cylinder chassis. The motor is an L-head block casting with cylinders measuring 4½ x 5¼ inches and rates at 44 horsepower. Transmission elements include pressed steel leather-faced cone clutch, three-speed selective rear axle gearset, Stutz rear system; wheelbase is 116 inches on 34 x 4 tires.

Prices—Touring car, $1,385; roadster, $1,385.

Changes from Previous Construction—The car is new throughout.

Selling Points—Long-stroke motor, unit power plant supported at three points, shaft drive, magneto and dynamo, Ward-Leonard electric lighting system, engine starter, left drive with center control, gear shift lever between front seats, low appearance, outside running boards, gasolene tank in cowl with gasolene tank gauge, Stutz rear system, embedded dash lamps, nickel plated trimmings, Renault type cooling.

Equipment—Ward-Leonard electric lighting system, Disco engine starter, demountable rims with an extra rim, gasolene gauge, horn, robe rail, pump, jack, complete tool and tire repair outfit.

FLANDERS.

Flanders Motor Co., Detroit, Mich.

Models—Two models on two six-cylinder chassis cast, the larger styled "40-six" and the smaller styled "30-six." Both motors are block cast, the larger measuring 4 x 4¼ and rating 50 horsepower and the smaller measuring 3½ x 4½ and rating 40 horsepower. Both have cone clutches, three-speed selective gearsets and floating rear axles. Wheelbases are 115 inches for the "30-six" on 34 x 4 tires and 130 inches for the "40-six" on 36 x 4½ tires.

Prices—"30-six" four-passenger touring, $2,250; seven-passenger touring $2,250. "40-six" five-passenger touring, $1,550.

Changes from Previous Construction—The cars are new throughout.

Selling Points—Six-cylinder motors, unit cast, balanced pistons, positive oiling system, Splitdorf dual ignition, Gray & Davis electric lighting and engine starting system, reserve gasolene supply, selective gearsets operating without use of H-plate, roller accelerator pedal of new type, large diameter cone clutch, resilient springs, exceptionally roomy bodies, front seats divided, glove and goggle compartments provided, 130-inch wheelbase, deep upholstery and complete equipment.

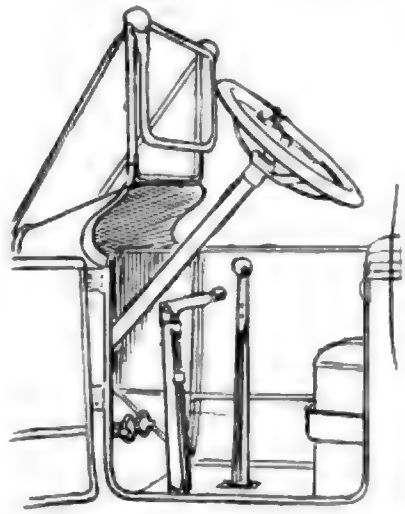
Equipment—Mohair top with envelope and side curtains, clear vision windshield, Warner speedometer, electric horn, Gray & Davis electric lighting and engine starting system, trouble lamp, cigar lighter, tire irons, tools, pump, and jack.

LITTLE.

Little Motor Car Co., Flint, Mich.

Models—Two models on two chassis, one a "four" and the other a "six." Both have L-head motors, the "four" being pair-cast, measuring 3½ x 3½ and rating 20 horsepower, and the "six" being cast in threes, measuring 3 5/16 x 4¼ and rating 40 horsepower. Both have cone clutches, floating rear axles, the "four" being fitted with two-speed selective and the "six" with three-speed selective gearsets.

Prices—For the "four," which is made only in roadster, $690; for the "six" five-passenger touring car, $1,285.



LITTLE CONTROL LEVERS

Changes from Previous Construction—Both cars are new throughout.

Selling Points—Long-stroke motors, cone clutch, selective gearsets, floating rear axles, complete equipment, easy riding and comfortable, simple, three-quarter elliptic rear springs on "four," three-quarter platform springs on "six," nickel plated trimmings, low price, no brass to polish, electric lighting system on "six."

Equipment—For the "four": Top with envelope and side curtains, windshield, five lamps, Prest-O-Lite tank, horn, jack, pump, tools, tire repair kit. For the "six": The same, except that gas tank is replaced by dynamo electric lighting system.

FRANKLIN.

H. H. Franklin Mfg. Co., Syracuse, N. Y.

Models—Five models on four chassis, two of which are "fours" and two are "sixes." All motors are of the separately cast, valve in the head, air-cooled type, the two "fours" measuring 3⅛ x 4 for the "18" and 4 x 4 for the "25," and the "sixes" measuring 3⅝ x 4 for the "30" and 4 x 4 for the "38." All chassis have multiple disk clutches running in oil, three-speed selective gearsets and semi-floating rear axles. Wheelbases are 100 inches on 32 x 3½ tires for the "18," 103 inches on 32 x 4 tires for the "25," 116 inches on 34 x 4 tires for the "30," 123 inches on 36 x 4½ front and 37 x 5 rear tires for the model D "38," 129 inches on 37 x 5 tires for the model H "38."

Prices—Model M "30" two-passenger Victoria-phaeton and five-passenger touring, $2,900; model D "38" four-passenger torpedo phaeton and five-passenger touring, $3,600; model H "38" seven-passenger touring, $3,850; seven-passenger limousine, $4,850; model G "25" five-passenger touring, $2,000; model G "18" roadster, $1,650.

Changes from Previous Construction—Except for the addition of the Entz electric lighting and engine starting system there have been no alterations.

Selling Points—Air-cooled motor, Entz electric lighting and engine starting system, light weight, laminated wood sills, full-elliptic springs, economical of fuel, oil and tires; silence, flexibility, power, beautiful finish, policy of incorporating improvements as they are made, re-circulating oil system with dash sight feed, automatic spark control, needle valve dash control, Franklin carburetter, multiple disk clutch in oil, tubular axles, large tires.

Equipment—Extension top with envelope and side curtains, windshield, Warner speedometer, demountable rims with one extra, electric lighting and engine starting system on six-cylinder models, full tool equipment, pump, jack and tire repair kit.

FIAT.

F. I. A. T., Poughkeepsie, N. Y.

Models—Six models on three chassis each, two of them "fours" and the other a "six." All have block cast L-head motors, the "fours" measuring 4¾ x 6 and 5⅛ x 6¾ and rating 35 and 55 horsepower, respectively, and the "six" measuring 4½ x 6 and rating 50 horsepower. All have Fiat multiple disk clutches, four-speed selective gearsets and semi-floating rear axles; wheelbases are 123 inches for the "4-35" on 36 x 4½ tires; 128 inches for the "4-55" on 36 x 4½ front and 37 x 5 rear tires, and 135 inches for the "six" on the same size tires.

Prices—Model 54, "4-35" touring and convertible roadster, $4,000; limousine, $5,000; landaulet, $5,100. Model 55, "4-55," touring or convertible roadster, $4,500; limousine, $5,500; landaulet, $5,600. Model 56 "six" touring and convertible roadster, $5,000; limousine, $6,000; landaulet, $6,100.

Changes from Previous Construction—Model 55 is a new car all the way through, though in it are retained all the distinctive Fiat features; it differs from the others only in that it has a compression release. The

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other models are virtually without mechanical change though body lines and appointments have been improved.

Selling Points—Block motor with intake exhaust manifolds cast integral and water jacketed; only two timing gears; magneto and water pump on transverse front shaft driven by spiral gears; positive force-feed lubrication, smoke eliminated, radiator hung on Fiat patented trunnions, multiple disk clutch in oil, wheel fan, four-speed selective gearset, long wheelbase, easy riding springs, semi-floating rear axle in Fiat patented two-piece housing eliminating radius and torsion rods, luxurious upholstery, beautiful body lines and complete equipment.

Equipment—Top of best English mohair with side curtains and envelope; special Fiat windshield, complete Gray & Davis lighting system, 100-mile Stewart & Clark speedometer-gradometer with Seth Thomas clock, large Klaxon, bulb horn and tube, Q. D. demountable rims, trunk rack, tire irons, robe and foot rail, wheel-puller, complete set of tools, pump and jack.

HAYNES.

Haynes Automobile Co., Kokomo, Ind.

Models—Nine models built on two four-cylinder chassis, one the Model 24 and the other the Model 22. The larger chassis is equipped with T-head motor, cast in pairs, cylinders measuring 4½ x 5½ inches, rated at 40 horsepower; clutch, a contracting steel band on a steel drum; three-speed selective gearset, a full-floating rear axle, 120-inch wheelbase on 36 x 4½-inch tires. The smaller chassis has an L-head motor, cylinders cast in pairs, 4½ x 5½ inches, same clutch and gearset, 110-inch wheelbase, full-floating rear axle, 34 x 4-inch tires.

Prices—Five-passenger touring Model 24, $1,785; four-passenger touring and two-passenger roadster, same; Model 22 five-passenger and four-passenger touring, $2,250; three-passenger coupe, $2,750; seven-passenger limousine, $3,400; seven-passenger Berline, $3,500.

Changes from Previous Construction—Model 24 has an L-head motor, center control and left-hand steering. In general construction this chassis design is similar to the Model 22. The latter shows but few changes over preceding models, except for refinements in design, construction and quality.

Selling Points—Haynes T-head motor, independent unit system, electric starting and lighting outfit, 12-inch upholstery, extra large touring body, Haynes clutch, Timken roller bearings throughout, combined rigid-flexible motor suspension, three-quarter elliptic spring suspension, very flexible and long springs, long wheelbase.

Equipment—Silk mohair top, top cover; two large Edmunds & Jones electric head lights, glass front, electric side lights, electric tail light, electric cowl lamp, electric starter, electric generator, 100-ampere-hour storage battery, Warner 60-mile autometer, standard bumper, horn, coat and foot rails, tire irons, full equipment tools, etc., one extra demountable rim.

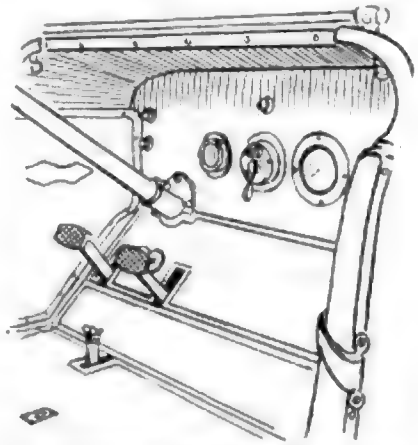
HERRESHOFF.

Herreshoff Motor Co., Detroit, Mich.

Models—Three models on one four- and one six-cylinder chassis. Both chassis have unit power plants with T-head cast motors, cylinder dimensions being 3⅛ x 4½ in both. Ratings are 30 and 36 horsepower, respectively. Both have multiple disk clutches, four-speed selective gearsets and semi-floating rear axles. Wheelbases are 110 inches for the "four" on 32 x 3½ tires and 124 inches on 34 x 4 tires.

Prices—The 30-horsepower roadster, $1,250; touring, $1,350. The 36-horsepower "six" touring car, $1,700.

Changes from Previous Construction—The "six" is a new car throughout. Changes in the "four" include enclosed valves, four-speed gearset, aluminum crank, clutch and



HERRESHOFF CONTROL ELEMENTS

gear case, extra large tires, lighting and starting system, shrouded dash bodies, complete equipment added.

Selling Points—Long-stroke block motor, unit power plant, multiple disk clutch, four-speed selective gearset, left-hand drive, right-hand control, full platform springs, shrouded dash, nickel and black trimmings, electric lighting and engine starting system.

Equipment—Top with envelope and side curtains, speedometer, windshield, complete Westinghouse electric lighting and engine starting system, combination oil and electric lamps, demountable rims with one extra, horn, tools, tire repair kit, pump, and jack.

HUPMOBILE.

Hupp Motor Car Co., Detroit, Mich.

Models—Four models on one four-cylinder chassis mounting an L-head block-cast motor with cylinders measuring 3¼ x 5½ and rating 32 horsepower. Transmission elements include multiple disk clutch, three-speed selective gearset and full-floating rear axle; chassis is built in two wheelbase lengths—100 and 126 inches—tires being 32 x 3½ on small cars and roadsters and 33 x 4 on larger cars and coupe.

Prices—Roadster and four-passenger touring car, $975; three-passenger coupe, $1,350; six-passenger touring car, $1,175.

Changes from Previous Construction—Body lines have been refined and nickel plated trimmings adopted; all models are painted a uniform Hupmobile royal black.

Selling Points—Small bore, long-stroke motor, unit power plant, cylinders cast in a single block, all working parts enclosed, pressure feed system of lubrication, Bosch high tension magneto, Zenith carburetter, multiple disk clutch, three-speed selective gearset, full-floating rear axle, rear shock absorbers, quick-detachable rims, full equipment, low cost of upkeep, easy riding qualities by reason of low hung construction, center control, both doors accessible, right-hand drive, heavy artillery wheels; speed, 4 to 55 miles an hour; distinctive appearance by reason of body construction.

Equipment—Silk mohair top with envelope and Jiffy curtains, clear vision windshield, Prest-O-Lite tank, quick-detachable rims, tools, horn, rear shock absorber. Coupe body fitted with electric lights and horn fed from 100-ampere-hour storage battery; combination speedometer and clock.

HAVERS.

Havers Motor Car Co., Port Huron, Mich.

Models—Five models built on two six-cylinder chassis. Both motors have L-head pair-cast cylinders, the larger measuring 4 x 5 and rating 55 horsepower and the smaller measuring 3¼ x 5 and rating 44 horsepower. Both have multiple disk clutches, three-speed selective gearsets and floating rear axles. Wheelbases are 122 inches and 128 inches for the smaller and larger models, respectively, tires being 36 x 4 on both.

Prices—"Six-44" in roadster, four- and five-passenger touring form, $1,850; "six-55" in roadster and five-passenger touring form, $2,250.

Changes from Previous Construction—The "six-55" is a new car throughout and differs from the older model only in the size of the parts; alterations in the "six-44" are largely in the nature of detail refinements.

Selling Points—Unit power plant, multiple disk clutch in which both sides of driving disks are Raybestos faced, three-speed selective gearset, full-floating rear axles, exceptionally roomy tonneau and front compartments, quality of upholstering and finish, electric lighting and engine starting on the "six-55." Disco starter on the "six-44."

Equipment—Top with envelope and inside curtains, patent adjustable windshield, speedometer and grade indicator; electric lighting and engine starting system on the "six-55"; Disco starter on the "six-44"; Gray & Davis lamps, horn under hood, tools, tire repair kit, jack, and pump.

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KISSEL.

Kissel Motor Car Co., Milwaukee, Wis.

Models—Twelve models on four chassis, one a "six" and the other three "fours." All motors are of the L-head type with the cylinders cast in pairs, the dimensions being 4½ x 4¾, 4½ x 5½, 4⅜ x 5 and 4½ x 5¼, respectively, for the "30," "40," "50" and "6-60." All have cork insert cone clutches and all but the "30" have four-speed selectively operated gearsets; the "30" has a three-speed gearset. Wheelbases are 116, 120, 132 and 140 inches, respectively, on 30 x 4, 33 x 4½, 36 x 4½ and 37 x 5 inch tires.

Prices—For the "6-60": Touring and roadster $3,150; limousine, $4,650; enclosed limousine, $4,900. For the "4-50": Touring, $2,500; limousine, $4,000; enclosed limousine $4,250. For the "4-40": Semi-touring, $2,000, coupe, $3,000. For the "4-30": Semi-touring, $1,700; semi-racer, $1,900, coupe, $2,450.

Changes from Previous Construction—Electric lighting and engine starting system added, strokes increased, anti-smoke device added, timing gears now driven by new "silent" chain, larger valves, more easily operated clutch pedals, wider springs, better upholstery, roomier tonneaux.

Selling Points—Diversity of models, long wheelbase, deep upholstery, wide springs, wide rear low seats, unusually high factor of safety, complete electric lighting and engine starting system, easy control, simple operation, new body lines which eliminate angles, absence of vibration.

Equipment—Mohair or Pantasote top with side curtains and envelope, glass front, electric lighting and engine starting system, shock absorbers front and rear, demountable rims with an extra rim, Stewart & Fisk speedometer, double tire irons, Solar lamps, robe and foot rails, horn, jack, tire repair kit.

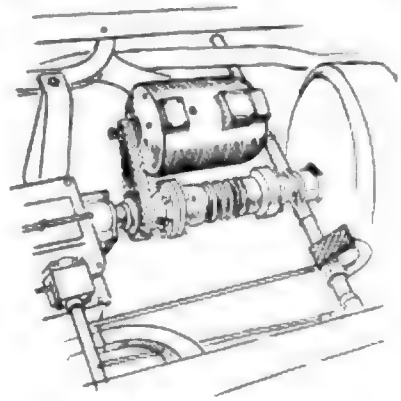
KLINE.

Kline Motor Car Corp., Richmond, Va.

Models—Four models each on four chassis, two of which are "sixes" and two are "fours." In the "6-60" the motor is T-head type and measures 4½ x 5½; the "6-50" motor, separately cast and measures 4½ x 5. Both four-cylinder motors are T-head, the "40" being pair cast and measuring 4½ x 5½ and the "30" being separately cast and measuring 4 4½. All have cone clutches and four-speed selectively operated gearsets with direct drive on third speed. Wheelbases are, for the "6-60," 132 inches on 37 x 5 tires; for the "6-50," 126 inches on 36 x 4½ tires; for the "4-40," 118 inches on 34 x 4 tires; for the "4-30," 115 inches on 34 x 4 tires.

Prices—For the "6-60": Touring, $3,500; roadster, $3,250; coupe-roadster, $3,750; Speed car, $3,250. For the "6-50": Touring and roadster, $2,850; coupe-roadster, $3,350; Speed car, $2,800. For the "4-40": Touring and roadster $2,250; coupe-roadster, $2,750; Speed car, $2,200. For the "4-30": Touring and roadster, $1,850, with Ever Ready starter, or $1,750 with Prest-O-Lite starter.

Changes from Previous Construction—Mechanically, all the models are without change; otherwise, the cushions have been

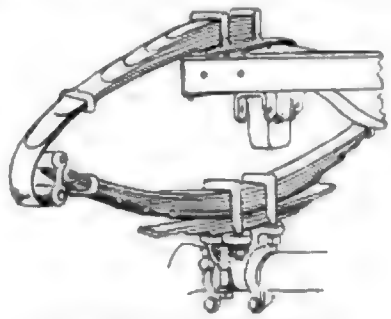


KLINE DYNAMO POSITION

increased in thickness to 10 inches, 25 candlepower lamps take the place of the less powerful head lamps, auxiliary shock absorbers have been added, electric lighting and engine starting systems have been added to all, and tire sizes have been increased.

Selling Points—Wide latitude for choice in purchasing, long-stroke flexible motor, smokeless pistons, long wheelbase, deep cushions, large tires, simplicity of control, Rushmore lighting system, large baggage carrying space, careful finish.

Equipment—Semi-Duquesne silk mohair top with side curtain and envelope, adjustable rain-vision windshield, demountable rims, Rushmore electric lighting system,



KLINE AUXILIARY SPRINGS

engine starter, speedometer, horn, foot rail, coat rail, tire repair kit, pump, jack, tools.

KNOX.

Knox Automobile Co., Springfield, Mass.

Models—Four models on two four and two six cylinder chassis. All motors are pair-cast with the valves overhead in removable cylinder heads without cages, both "fours" measuring 5 x 5½ inches and rating 40 horsepower. The "Little Six" motor measures 4⅜ x 5½ inches and rates 48 horsepower, and the other "six" measures 5 x 5½, and rates at 66 horsepower. Transmission elements are the same in all and include: Knox three-plate clutch with cork inserts, three-speed selective gearset, full-floating rear axle, wheelbases of the four models are 122, 126, 130 and 134 inches, respectively, and the tire sizes are 36 x 4½, 37 x 5, 38 x 5 and 38 x 5½.

Prices—Model 44: Raceabout, $3,300; four-passenger torpedo $3,400, five-passenger torpedo, $3,450; touring car, $3,500, limousine, $4,400, and landaulet, $4,450. Model 45: Raceabout, $3,600; six-passenger torpedo, $3,700; touring car, $3,800; limousine, $4,700; landaulet, $4,750. Model 46: Raceabout, torpedo and touring car, $4,350; limousine, $5,350; landaulet, $5,400. Model 66: Raceabout, torpedo and touring car, $5,000; limousine, $6,400; landaulet, $6,450.

Changes from Previous Construction—The "Little Six" "46" is a new car throughout. On the other models, spirally cut gears are used instead of spur gears in the gearsets, cellular type radiator instead of tubular is used; all metal universal joints used instead of leather covered ones; three- instead of two-bladed fan; dash lamps imbedded; electric lighting and starting systems have been added.

Selling Points—Unit power plant with flexible three-point support, valves in detachable cylinder heads without cages, two independent ignition systems, compact and strong three-speed selectively operated gearset put together without lock washer or cotter pins, dry three-plate clutch, De Dion type circulating lubrication system, full-floating rear axle with special provision for making adjustments, three-quarter elliptic springs with extra long span, center control with option of either right or left drive, straight line drive with average load. On the "Little Six" model camshaft is driven by "silent" chain; extra large valves and water-jacketed manifold, absence of radius rods while permitting perfect spring action, unusual appearance lent by V-shaped radiator, deep cushions, careful finish. Six-cylinder models are equipped with electric lighting and acetylene engine starting systems.

Equipment—Top, with jiffy side curtains and envelope, glass windshield, Jones speedometer-clock, combination Klaxonette bulb and electric horn, motor driven tire pump, Fisk demountable rims with an extra rim, tire carriers, jack, hand tire pump, tire repair kit, full set of tools, usual complement of lamps. Four-cylinder models have automatic head lamp lighters and Prest-O-Lite tank. Model 46 has electric lighting system. Electric starting system installed on all models for $150 extra.

LENOX.

Lenox Motor Car Co., Boston, Mass.

Models—Seven models on two chassis, one a "four" and the other a "six." The

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"six" motor is of the T-head type, with cylinders measuring 4 x 5 and rating 60 horsepower; the "four" motor is of L-head type with cylinders 4¼ x 5½ and rating 40 horsepower. Both have cone clutches, three-speed selective gearsets and floating rear axles. Wheelbases are 130 inches on 36 x 4½-inch tires for the "six" and 118 inches on 36 x 4-inch tires for the "four."

Prices—For the "six": Six-passenger touring, $2,750; limousine, $4,050. For the "four": Speedster, $2,100; four- and five-passenger touring, $2,000; limousine, $3,300.

Changes from Previous Construction—The "six" is a new car throughout; in the "four" the bore has been increased ⅝ inch and the stroke ¼ inch; the wheelbase is 2 inches longer, bodies have been refined and fitted with one-piece windshield in place of two-piece; top material altered.

Selling Points—Long-stroke motor, electric lighting and starting system, full-floating rear axle, heavy wheels with 12 spokes in each, all springs bushed and lubricated with integral grease cups, deep Turkish upholstery, complete equipment.

Equipment—Top with envelope and side curtains, windshield, speedometer, electric lighting and starting system, demountable rims with one extra, tire irons, full complement of tools, foot and robe rails.

DETROITER.

Briggs-Detroiter Co., Detroit, Mich.

Models—Four models built on the same four-cylinder chassis mounting a unit power plant with L-head cylinders cast in a block measuring 3⅛ x 4¾ and rating 25 horsepower. Transmission elements include multiple disk clutch, three-speed selective gearset and full-floating rear axle. Wheelbase is 104 inches on 32 x 3½ tires.

Prices—Model A standard touring car, $850; Model A1 touring car with more complete equipment, $900; roadster in two models, $900.

Changes from Previous Construction—The car is new throughout and is exhibited for the first time.

Selling Points—Straight-line bodies, long-stroke motor, unit power plant, multiple disk clutch, three-speed selective gearset, full-floating rear axle, left-hand steering with center control, emergency brake operated by pedal, three-point suspension, ball-bearing transmission, double brakes, high-tension magneto.

Equipment—Model A: Top with envelope and side curtains, windshield, gas and oil lamps, generator, tire and repair tool kit, jack, and horn. Model A1, A2, A3, A4: Same, including Prest-O-Lite tank, quick-detachable demountable rims, Stewart speedometer tire irons and robe rails.

FIRESTONE-COLUMBUS.

Columbus Buggy Co., Columbus, O.

Models—Eight models built on three chassis, two of which are "fours" and the third is a "six." The four-cylinder motors measure 4⅛ x 5¼ and 4½ x 5½ and the "six" is rated at 68 horsepower. Wheelbases are 122 inches for the "four" and 130 inches for the "six."

Prices—Not publicly quoted.

Changes from Previous Construction—Steering gear shifted to the left side, with the control levers in center of footboard.

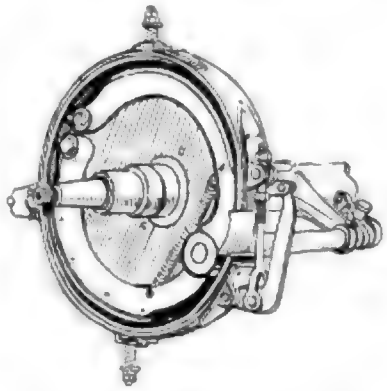
Selling Points—Continental motors, electric lighting and starting system, high-tension magneto, imported annular bearings, left-hand steering with central control, extra tires suspended at rear of body, electric lighting and engine starting system, complete equipment.

Equipment—Silk-faced mohair top, ventilating windshield, speedometer, robe rail, foot rail, tire and license brackets, the usual assortment of tools and spare parts, tire repair kit, pump, jack, and horn.

OVERLAND.

Willys-Overland Co., Toledo, O.

Models—Eight models built on two four-cylinder chassis. Both motors have separately cast cylinders, the smaller measuring 4 x 4½ and rating 30 horsepower and the larger measuring 4⅛ x 4½ and rating 45 horsepower. Both have cone clutches, three-speed selective gearsets and three-quarter-floating rear axles. Wheelbase of the smaller is 110 inches on 32 x 3½-inch tires for all except the coupe, which has 33 x 4 tires.



OVERLAND BRAKE MECHANISM

Prices—For the smaller: Five-passenger touring car, $985; five-passenger touring car with cowl dash and four-passenger torpedo, $1,010; roadster, $985; coupe (equipped with electric lighting and engine starting system), $1,500. For the larger roadster, four-passenger torpedo and five-passenger touring car, $1,475.

Changes from Previous Construction—The smaller has a longer wheelbase; complete equipment, electric lighting and engine starting system on some models, three-quarter-floating rear axle, new and larger brakes, roomier body, and minor improvements in motor. The larger models have longer wheelbases and substantially all the other improvements.

Selling Points—Five-bearing crankshaft motor with offset cylinders, acetylene engine starter, gearset combined with rear axle, three-quarter-floating rear axle of new design, 12 spokes in each wheel, long wheelbase, grease cups on spring bolts, oversized brakes, pumpless thermo-siphon cooling system, center control, special front door ventilation; model 71 also has electric lighting system and full-floating rear axle.

Equipment—All are equipped with top with side curtains and envelope, windshield, speedometer, gas lamps, horn, robe rail, foot rail, tire carriers, tools, tire repair kit, jack, pump, etc. The coupe has, in addition, electric lighting and engine starting system and an electric horn; the larger models have dynamo electric lighting system, all have acetylene engine starters; the U. S. L. electric lighting and engine starting system will be fitted to any at an extra cost.

HUDSON.

Hudson Motor Car Co., Detroit, Mich.

Models—Eleven models on one four- and one six-cylinder chassis, both motors measuring 4⅛ x 5¼ and rating 37 and 54 horsepower, respectively. Both have multiple disk clutches, three-speed selective gearsets and full-floating rear axles. Wheelbases are 118 inches on 36 x 4 tires for the "four" and 127 inches on 36 x 4½ tires for the "six."

Prices—For the "four-37": Touring, torpedo or roadster, $1,875; coupe, $2,350; limousine, $3,250. For the "six-54": Five-passenger touring, torpedo or roadster, $2,450; seven-passenger touring, $2,600; coupe, $2,950; limousine, $3,750.

Changes from Previous Construction—Both cars are new throughout and are exhibited for the first time.

Selling Points—Delco electric lighting and engine starting system, multiple disk clutch, three-speed selective gearset, full-floating rear axle, long wheelbase, simple and beautiful flush-sided bodies, 12-inch Turkish upholstery, A No. 1 hand-buffed leather, cellular type radiator, co-operation of 48 engineers in design.

Equipment—Top with envelope and side curtains, rain-vision windshield, speedometer-clock combination, demountable rims, tire repair kit, tools, tire irons, jack, pump, horn, etc.

CARTERCAR.

Cartercar Co., Pontiac, Mich.

Models—Four models built on the same four-cylinder chassis mounting an L-head motor measuring 4⅛ x 4¼. Friction transmission is employed and the rear axle is of the three-quarter-floating type. Wheelbase is 116 inches on 36 x 4 tires.

Prices—Roadster, $1,600; five-passenger touring, $1,700; coupe, $1,900; Sedan, $2,000.

Changes from Previous Construction—Gasolene tank has been placed in cowl dash; frame has been lowered slightly.

Selling Points—Cartercar patented friction transmission, eliminating the use of

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gears and giving an unlimited number of speeds; "silent" chain running in oil-tight case delivering maximum power to rear axle; great flexibility; both transmission and chain absolutely noiseless in operation. Long wheelbase, accessibility, grease cups on all spring shackles and steering connections, efficient cooling by honeycomb radiator, deep upholstery.

Equipment—Complete self-contained electric lighting and engine starting system, mohair top with envelope, one-piece ventilating windshield, 60-mile combination speedometer, electric lamps, dash lamp, inverted horn, robe rail, foot rail, nickel-plated and black enamel trimmings, Firestone demountable rims, trunk rack and rebound straps, storage battery, tire pump, jack, tire repair kit, full set of tire irons.

LOCOMOBILE.

Locomobile Co., Bridgeport, Conn.

Models—Seven models built on three chassis, two of which are "sixes" and the other a "four." All three motors are of the L-head pair-cast type, the "four" measuring 4 x 4, and rating 30 horsepower, the "Little six" measuring 4¼ x 5 and rating 48 horsepower, and the "Big six" measuring 4½ x 5½ and rating 48 horsepower. Each has a leather-faced cone clutch. The two "sixes" have multiple disk clutches; all have four-speed selective sliding gears and floating rear axles. Wheelbases are 120 inches for the "four" on 36 x 4 tires, 128 inches for the "Little six" on same size tires, and 136 inches for the "Big six" on 36 x 4½ front and 37 x 5 rear tires.

Prices—For the "four": Roadster, touring car, coupe, $3,000. For the "Little six": Roadster, torpedo and touring, $4,300; coupe, $5,350; landaulet, $5,450; berline limousine, $5,550; berline landaulet, $5,650. For the "Big six": Roadster, torpedo and touring, $5,600; limousine, $6,000; landaulet, $6,100.

Changes from Previous Construction—The "four" and the "Little six" remain practically unaltered, though a number of refinements have been made in the "Big six." Wheelbase has been increased, new carburetor adopted, oil pump driven from intake instead of exhaust side, cooling system, including pump, radiator and jackets, is greater, new valve lifters have been adopted, motor is larger and has new mounting, all models now have aluminum cowl dashes.

Selling Features—Long-stroke six-cylinder motors; flexibility; positive, smokeless lubrication system; manganese bronze crank and gear case unit multiple disk clutch, four-speed selective gearset, seven-bearing crankshaft, complete electric lighting system, Disco engine starter, 10-inch upholstery, deep cowl dashes, careful finish, wide variety for choice in models.

Equipment—Silk mohair top with envelope and side curtains, rain vision windshield, dynamo electric lighting system, Disco engine starter, power driven air compressor, demountable quick-detachable tires with one extra, tire carriers at back of body, robe rail, foot rest, tools, horn, jack, pump, and tire repair kit.

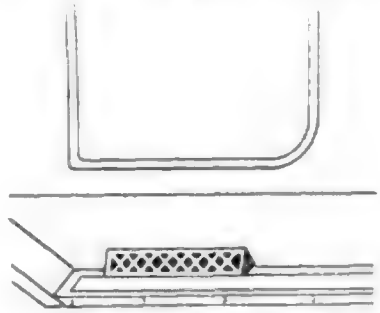
BUICK

Buick Motor Co., Flint, Mich.

Models—Five models built on three four-cylinder chassis, the "24-25," the "30-31" and the "40." All motors are of the valve-in-the-head type, the "24-25" measuring 3¾ in. square and rating 28 horsepower, the "30-31" measuring 4 in. square and rating 32 horsepower, and the "40" measuring 4¼ x 4½ and rating 40 horsepower. All have cone clutches, three-speed selective gearsets, with full-floating rear axle on the "40" and semi-floating in the others. Wheelbases are 105 for the "24-25" on 32 x 3½ tires; 108 inches for the "30-31" on 34 x 3½ tires; 115 inches for the "40" on 36 x 4 tires.

Prices—"24" roadster, $950; "25" touring car, $1,050; "30" roadster, $1,125; "31" touring car, $1,285; "40" touring car, $1,650.

Changes from Previous Construction—Model "40" is new all the way through, though it embodies the essential Buick features common to all, front axles in all cars now are of I-beam section, drop-forged.



BUICK PAINT PROTECTOR

Selling Points—Valve-in-the-head motor; semi-elliptic and three-quarter elliptic rear springs of strength and resilience; deep cushions; graceful contour permitting maximum of leg room; integral wind-shield without brass dividing line; well-fitting tops.

Equipment—Mohair top with side curtains and rubber envelope; Disco engine starter; demountable rims; combination oil and electric lights on the "40" connected to "6-60" storage battery; oil lamps with acetylene head lamps and Prest-O-Lite tank on others; horn; jack; tools; tire repair kit; spare parts; robe and foot rail.

JACKSON.

Jackson Automobile Co., Jackson, Mich.

Models—Three models on three chassis, two of which are "fours" and the other a "six." All motors are of the L-head type, with cylinders cast in pairs; dimensions of the smaller "four" and the "six" are 4⅛ x 4¾ and the ratings are 35 and 55 horsepower, respectively; the larger four measures 4½ x 5¼ and rates 45 horsepower. In all, cone clutches, three-speed selectively operated gearsets and full-floating rear axles are used. Wheelbases are 138 inches on 36 x 4½ inch tires for the "six"; 124 inches on 36 x 4 tires for the "4-45," and 115 inches on 34 x 4 tires for the "4-35."

Prices—For the "six," which is styled "Sultanic," five-passenger touring, $2,500; seven-passenger, $2,650; for the "4-45," which is styled "Majestic," $1,850 ($1,975 with electric lighting and starting system); for the "4-35," styled "Olympic," $1,500.

Changes from Previous Construction—All three models are new throughout.

Selling Points—Comfort, obtained by means of full-elliptic springs front and rear and deep upholstery; roomy tonneau and front compartments, unit construction motor, clutch and gear-set; ball bearing mounted transmission shafts, pressure gasolene feed to gravity tank under cowl, Disco engine starter on the "fours," electric starter on the "six"; dynamo electric lighting system on the Sultanic and the Majestic, Olympic equipped with electric device for lighting head lamps; black and nickel plated trimmings.

Equipment—Mohair top with side curtains and envelope, speedometer, windshield, Firestone demountable quick-detachable rims with an extra rim, tire irons, foot and robe rails, tools, tire repair kit, pump, jack, and horn. The Sultanic and the Majestic also have electric lighting systems, the former having an electric starter.

MATHESON.

Matheson Automobile Co., Wilkes-Barre, Pa.

Models—Two models built on the same six-cylinder chassis mounting a pair-cast valve in the head motor measuring 4½ x 5 and rating 50 horsepower. Transmission elements include multiple disk clutch in oil, three-speed selective gearset and full-floating rear axle. Wheelbase is 135 inches on 36 x 4½ front and 37 x 5 rear tires.

Prices—Series "B": Five-passenger touring, $3,750; seven-passenger touring, $4,000. Series "C," differing from model "B" mainly in body types and equipment and some further chassis refinements, seven-passenger touring car, $4,800.

Changes from Previous Construction—Running boards one inch wider and 1½ inches lower, edged with aluminum; new tool boxes, control lever lower ends enclosed in aluminum housing, all equipment removed from dash, rear axle and gearset housing increased in size and fitted with partition permitting use of separate lubricants, single-cylinder power tire pump added, brakes increased in diameter and face, one oil filler replaces two formerly used, oil level gauge provided, new design oil reservoir, gear ratios in gearset changed slightly, new design valve cage domes, larger fan and pump, fan-spoked flywheel adopted, constant pressure fuel supply by plunger pump instead of exhaust pressure.

Selling Points—Silent operation, light weight per horsepower, large bearing sur-

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faces, great flexibility of motor, great mileage per gallon of fuel and oil, great mileage on tires, multiple disk clutch, irreversible steering gear, easy riding qualities, strong gearset, straight-line drive, interlocking device on gearset, handsome and luxurious bodies, electric lighting and engine starting system, efficient braking system, complete equipment.

Equipment—Dynamo electric lighting and engine starting system, inspection electric lamp with 10 feet of cord, extension top with envelope, clear-vision folding glass front, Warner speedometer, Klaxon horn with storage battery, reed horn, power air pump and pressure gauge for inflating tires, gasolene gauge, two shock absorbers on rear springs, tire carriers attached to rear of car, quick-detachable demountable rims, coat and blanket rail, folding foot rest, Yale locks with Universal key for tool and storage compartments and hood, spacious lockers for tools and equipment between frame and running boards, two soleleather suitcases in compartment under front seats, foot scrapers, three oil cans attached to motor base, oil gun, tire pump, jack, and full set of tools.

PEERLESS.

Peerless Motor Car Co., Cleveland, O.

Models—Five models on four chassis each, three of them being "sixes" and the other a "four." Motors are all of the T-head type, with cylinders cast in pairs, the measurements being 4 x 5½ for the "38-6," 4¼ x 6 for the "48-6," 5 x 7 for the "60-6," and 5 x 5½ for the "40-4." All have internal expanding cork insert clutches, four-speed selective gearsets and arched full-floating rear axles. Wheelbases are 125 inches on 36 x 4½ tires for the "38-6," 137 inches on 36 x 4½ front and 37 x 5 rear tires for the "48-6," 140 inches on 38 x 5½ tires for the "60-6," and 125 inches on 36 x 4½ front and 37 x 5 rear tires for the "40-4."

Prices—For the "38-6": Roadster, touring and torpedo, $4,300; coupe, $5,000; limousine, $5,300; landaulet, $5,400; berline limousine, $5,500. For the "48-6": Open bodies, $5,000; limousine, $6,000; landaulet, $6,100; berline limousine, $6,200. For the "60-6": Open types, $6,000; limousine, $7,000; landaulet, $7,100; berline limousine, $7,200. For the "40-4": Open types, $4,300; limousine, $5,300; landaulet, $5,400; berline limousine, $5,500.

Changes from Previous Construction—Complete Gray & Davis electric lighting and engine starting system adopted; a butterfly throttle replaces the piston valve, dual ignition replaces double ignition, tire sizes of the "38-6" and the "60-6" have been increased, side lamps have been imbedded in dash.

Selling Points—Long stroke six-cylinder motors that are flexible and powerful at low flywheel speeds, four-speed gearset mounted in center of frame, thus distributing weight and reducing amount of unsprung weight; rear axles arched and rear wheel dished, Gray & Davis electric lighting and engine starting system, unsually wide and roomy bodies, careful paint work, concealed door hinges and latches, complete equipment, extra long wheelbases and exceptionally resilient springs.

Equipment—Peerless mohair top with envelope and side curtains; Gray & Davis electric lighting and engine starting system, folding windshield, universal demountable quick-detachable rims with one extra, four-cylinder power driven tire pump, locks for ignition, tools, and tire holders, tire carriers, coat rack, foot rest, tool equipment, horn and jack.

PULLMAN.

Pullman Motor Car Co., York, Pa.

Models—Eleven models built on three chassis, two of which are "fours" and the third is a "six." All have T-head, pair-cast cylinders, the "6-66" and the "4-44" measuring 4½ x 5½ and the "4-36" measuring 4 1/16 x 5. All have cone clutches, four-speed selective gearsets and full-floating rear axle, wheelbases being 138, 122 and 118 inches, respectively, on 36 x 4½, 36 x 4 and 34 x 4 tires.

Prices—For the "6-66" seven-passenger touring, $2,750; "4-44" five-passenger touring, $2,150; "4-36" five-passenger touring, $1,875.

Changes from Previous Construction—Nineteen-inch rubber steering wheel adopted, horn placed inside hood, longer springs, rear tire irons, broader fenders, clear running boards, oil control and carburetter primer placed on dash.

Selling Points—Motor, gearset and steering gear made in Pullman shops, electric lighting and engine starting system, spring insert cone clutch, four-speed selective gearset, full-floating rear axle, heavy artillery wheels with bossed spokes in rear, grease cups integral with spring bolts, extra strong gearset, gearsets on "fours" and "sixes" interchangeable.

Equipment—Top with envelope and side curtains, rain-vision windshield, Stewart speedometer, complete electric lighting and engine starting system, tools, tire repair kit, electric vulcanizer, Firestone demountable rims, pump, jack, and horn.

PACKARD.

Packard Motor Car Co., Detroit, Mich.

Models—Nine models on two chassis, both "sixes." Both have L-head pair-cast cylinders, the "38" measuring 4 x 5½, and the "48" measuring 4½ x 5½. All have dry plate clutches, three-speed semi-selectively operated gearsets; wheelbases of the standard chassis are 134 for the "38" with 36 x 4½ tires all around, 133 for the "48" with 36 x 4½ front and 37 x 5 rear tires.

Prices—For the "38": Phaeton, $4,150; runabout, $4,050; limousine, $5,200; landaulet, $5,300; imperial limousine, $5,400; brougham, $5,200; coupe, $4,500; imperial coupe, $4,900. For the "48": Runabout, $4,650; touring, $4,850; phaeton, $4,750; limousine, $5,850; landaulet, $5,950; imperial limousine, $6,050; brougham, $5,800; coupe, $5,100.

Changes from Previous Construction—The "38" is a new car throughout. In the "48" a new engine oiling system has been adopted, a new coupling between the exhaust manifold and the muffler pipe is used, three-quarter elliptic rear springs replace the semi-elliptic ones, the gas tank has been placed at the back of the body, an electric lighting and engine starting system and an acetylene primer have been added, bodies have been made roomier.

Selling Points—Conservative motor rating, auxiliary oiling system, hydraulic engine governor, unit motor and clutch construction, dry plate clutch, semi-selective gearset on rear axle, electric lighting and engine starting system, steering column control mechanism, roomy bodies, wide latitude for choice.

Equipment—Packard extension cape cart top with side curtains and envelope, on touring cars and phaetons; runabout equipped with Victoria top, curtains and envelope. Packard storm-tilt windshield on all models; electric lighting and engine starting system, acetylene primer, demountable rims, tools, tire irons, spare parts, etc.

MICHIGAN.

Michigan Motor Car Co., Kalamazoo, Mich.

Models—Four models built on two four-cylinder chassis. Both motors are of the L-head block type, the smaller measuring 4 1/16 x 4½ and rating 33 horsepower and the larger measuring 4¼ x 5¼ and rating 40 horsepower. Both chassis have multiple disk clutches, the "40" having four-speed selective gearset with direct drive on fourth and full-floating rear axle, and the "33" having three-speed selective gearset with three-quarter floating rear axle. Wheelbases are 118 inches for the "40" on 35 x 4½ tires and 114 inches for the "33" on 34 x 4 tires.

Prices—For the "40": Roadster and five-passenger touring, $1,585. For the "33": Roadster and five-passenger touring car, $1,400.

Changes from Previous Construction—Both cars are practically new throughout, though the Michigan characteristics have been retained. Timing gears now are lubricated from the oiling system; lower piston rings are beveled and their grooves drilled to obviate smoke; left-hand drive with center control is new, frame is deeper, brakes are larger, bodies are roomier, tire sizes have been increased; full-floating rear axle in the "40."

Selling Points—Electric lighting by generator as regular equipment, big easily operated cone clutch, over-size tires, left-hand drive with center control, 14-inch Turkish cushions, 80-horsepower rear axle, extra wide, easy riding springs; adjustable steering equipment, generous dimensions, rear seat 50 inches wide, 22 coats of paint and varnish, running boards clear of boxes, tool

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chassis underneath, genuine cellular radiator, foot rest accelerator.

Equipment—Best grade of mohair top with envelope and side curtains, built-in windshield, electric lighting system, electric horn, $50 4-inch speedometer, Firestone universal demountable quick-detachable rims, special foot rail, swing robe rail, rear tire irons, complete tool equipment, jack, and pump.

OLDSMOBILE.

Olds Motor Works, Lansing, Mich.

Models—Three models on one six-cylinder chassis. Motor is a unit power plant with L-head cylinders cast in pairs and measuring 4¼ x 4½, the rating is 50 horsepower. Transmission elements include cone clutch, three-speed selective gearset and full-floating rear axle. Wheelbase is 135 inches on 36 x 4½ tires.

Prices—Four-passenger and five-passenger touring, $3,200; seven-passenger touring $3,350.

Changes from Previous Construction—The car is new throughout and is exhibited for the first time.

Selling Points—Light weight, graceful body lines, 12-inch upholstery, 60-inch three-quarter elliptic rear springs, Delco current lighting, engine starting and ignition system, power tire pump, combination Klaxon signal, clear running boards, beautiful finish, restful reclining position afforded by seats, low price compared with other Oldsmobile "sixes."

Equipment—Top with envelope and side curtains, clear vision windshield, combination Warner speedometer and Waltham clock, Delco electric lighting, ignition and engine starting system, demountable rims with an extra rim, double tire carrier at back, tools, jack, tire repair kit, power tire pump.

O. N. L. Y.

Only Motor Car Co., Port Jefferson, L. I., N. Y.

Models—Two models on the same four-cylinder chassis. Motor is T-head, block-cast with cylinders measuring 4¼ x 7¾, horsepower rating 30 horsepower; transmission elements include leather-faced cone clutch, three-speed selective rear axle gearset and floating rear axle. Wheelbase of both models is 112 inches on 32 x 3½-inch tires.

Prices—Touring, $1,250; roadster, $1,000.

Changes from Previous Construction—There have been no alterations other than a few minor changes.

Selling Points—Exceptionally long stroke with 90 pounds compression and low horsepower rating; T-head construction, speed of 75 miles an hour guaranteed, 30 miles to the gallon of fuel guaranteed, three-jet carburetter, center of gravity of car in plane of wheel hubs, thermo-siphonic water circulation, Renault type rear axle, mounted on R. I. V. ball bearings; straight-line bodies and low, flush sides.

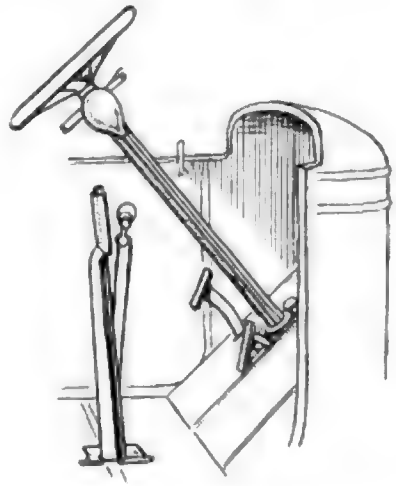
Equipment—Two oil side lamps and one tail lamp.

MAXWELL.

United States Motor Co., Maxwell-Briscoe Division, New York City.

Models—Three models on three four-cylinder chassis. All three chassis have unit power plants with T-head motors, the two smaller ones being pair-cast and the larger separately cast. The three motors measure 3¾ x 4, rating 22 horsepower; 4 x 4½, rating 30 horsepower, and 4¼ x 5¼, rating 40 horsepower. All have multiple disk clutches and three-speed selective gearsets, the two smaller models have semi-floating rear axles and the larger model has a full-floating rear axle. Wheelbases are 93 inches on 30 x 3½ tires for the "22," 106 on 32 x 3½ tires for the "30," and 115 inches on 36 x 4 tires for the "40."

Prices—"22" roadster, $785; "30" roadster and touring, $1,100 and $1,145, respectively; "40" touring, $1,675.



MAXWELL CONTROL ELEMENTS.

Changes from Previous Construction—The "22" remains substantially without change. In the "30" the motor stroke has been increased, connecting rods are longer, cylinders are not offset, plunger oil pump, bearing diameters increased, pistons redesigned for lightness and strength, integral camshafts, frame lowered, longer wheelbase, new spring suspension, new fenders, new front axle, new steering knuckles, new fan, roadster running board lengthened, additional grease cups, bottom of control levers boxed in. In the "40" the pistons have been made lighter and the connecting rods longer, compression has been lowered, stuffing box on valve push rods, small relief valves on motor, new inlet manifold, single water discharge pipe, three narrow rings on pistons, new style fan and radiator, larger gears and shafts, larger bearings, center control with left-hand steer, interlock on clutch removed, new accelerator pedal, bodies made larger and fitted with ventilators, thicker upholstery, gasolene tank mounted on frame, new dash, plain sides to bonnet, brakes adjustable.

Selling Points—Applying to the "40": Left-hand drive, center control, selective gearset, full-floating rear axle, three-point suspension, thermo-syphon cooling, T-head motor, multiple disk clutch, thorough lubrication system, demountable rims, electric lights, engine starter, deep Turkish upholstering, accessibility of parts, simplicity, Maxwell single adjustment carburetter, long-stroke motor, flexibility and economy. Applying to the "30": Designed as family touring car; abundant power and strength, multiple disk clutch, T-head motor, sliding gears, semi-floating rear axle, dual ignition, long-stroke motor, new design spring suspension, drop-forged front axle. Applying to the "22": Left-hand drive, center control, sliding gears, compact power plant, three-point support, multiple disk clutch, semi-floating rear axle, dual ignition, single adjustment carburetter, engine starter, full equipment, power beyond rating, vestibuled and ventilated body, large capacity tank, strong tire carriers, luggage deck.

Equipment—On the "22": Top with envelope and side curtains, engine starter, windshield, Prest-O-Lite tank, lamps, tools, horn, jack, pump, tire repair kit. On the "30": The same. On the "40": The same, including 60-mile speedometer, ventilators, tire carriers, combination oil and electric lights, demountable rims.

S. G. V.

The S. G. V. Co., Reading, Pa.

Models—Two models built on two four-cylinder chassis each. Both motors have block cast L-head cylinders, the smaller rating 25 horsepower and designated as models A and B, measuring 3¾ x 4¾, and the larger, rating at 35 horsepower, measuring 4 x 5¼. Both have multiple disk clutches, four-speed selective gearsets and full-floating rear axles. Wheelbases are 116 inches on 34 x 4 tires for the smaller and 118 on 35 x 4½ tires for the larger.

Prices—Model A four-and five-passenger touring car, $2,500; landau brougham, landaulet, limousine and coupe, $3,500. Model B roadster, $2,500. Model D touring car, four-and five-passenger, $3,250. Landau brougham, landaulet, limousine and coupe, $4,000. Model E roadster, $3,000.

Changes from Previous Construction—Models D and E are new throughout, though they retain the distinctive S. G. V. features, and are about 3 inches longer in the wheelbase. The only difference is in the engine, in which the bore and stroke have been increased.

Selling Points—Long-stroke, high-speed motor, multiple disk clutch with hardened and ground disks, block cast cylinders, valves fully enclosed, perfect balance, fan in flywheel, self contained oiling system, furnishing proper amount of oil at all speeds, four-speed gearset direct on fourth, noiseless shifting mechanism, imported ball

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bearings through front and rear axles and transmission, Fahrig metal engine bearings, chrome nickel frames, axles, propeller shafts, crank shafts, etc., genuine cellular tube, Mercedes type radiator, unit type power plant, hard rubber covered steering wheel and control lever handles, cast steel rear axle housings, rigid construction cast steel flywheel, throttle control incorporated in steering wheel spoke, spark control at center of wheel, clean dash with only oil and air pressure gauges, pressure feed gasolene system, 30-gallon tank on the rear, double rear tire irons, Bosch magneto with set spark on 25-horsepower models.

Equipment—Prest-O-Lite tank, tools, horn, tire kit and jack, license tag bracket, front and rear, demountable rims.

STODDARD-DAYTON.

United States Motor Co., Stoddard-Dayton Division, New York City.

Models—Four models on four chassis each, three of which are "fours" and the other is a Knight motor "six." The two smaller motors, rated at 30 and 38 horsepower, respectively, have L-head block-cast cylinders measuring 4 x 4½ and 4½ x 5⅛, respectively; the 48-horsepower motor has overhead valves and pair-cast cylinders measuring 4¾ x 5; the Knight engine has its cylinders cast in threes and measuring 4½ x 5½; it rates at 70 horsepower. All four chassis have cone clutches, three-speed selectively operated gearsets and floating rear axles. Wheelbases are 112 inches for the "30" on 33 x 4 tires, 114 inches for the "38" on 36 x 4 tires, 123 inches for the "48" on 36 x 4½ tires and 133 inches for the Knight model on 36 x 5 tires.

Prices—Model "30" roadster, $1,350; touring, $1,450. Model "38" roadster, $1,750; touring, $1,850; limousine and landaulet, $2,750; coupe, $2,350. Model "48" roadster, $2,700; touring, $2,800; limousine, $3,900. Knight model roadster, $4,000; touring, $5,000; limousine, $6,250. (With wire wheels, $50 extra.)

Changes from Previous Construction—There have been no changes of consequence in the three poppet valve models. In the Knight model there is a new improved I-beam front axle; improved worm and sector steering gear; larger radiator, larger wheel hub bearings, new design fenders, simplification of control system, longer touring body, electric side lamps built into dash.

Selling Points—For the "30," "38" and "48": Positive force feed oiling system, cone leather-to-iron clutch, bevel drive with one universal joint, heavy artillery wheels, metal bodies. For Knight model: Silent Knight six-cylinder motor, movable dam lubrication system, intake coreways in crankcase, carburetter adjustment from seat, "silent" chain camshaft drive, seven-bearing crankshaft, left-hand drive, center control, adjustable front seats, disappearing tonneau seats, engine driven dynamo, power tire pump, large tires, large gas tank, large brakes, simplicity of brake adjustment, spring suspension proportionate to weight and loads, deep upholstering, rubber cushions between frame and body; compartment body on roadster.

Equipment—With all cars: Mohair top with envelope and side curtains, full set tools, tire repair kit, horn, pump and jack; the "38" has, in addition, windshield and demountable rims. The "48" has, in addition, shock absorbers, combination electric and oil lamps. The Knight models have, in addition, trunk rack, ventilators, speedometer, electric horn, complete electric lighting system, and power driven tire pump.

VELIE.

Velie Motor Vehicle Co. Moline, Ill.

Models—Five models on two four-cylinder chassis. The small motor L-head block-cast type, with cylinders measuring 3¼ x 5½ and rating 32 horsepower, and the larger is of the L-head type with pair-cast cylinders measuring 4½ x 5¼ and rating 40 horsepower. Both have three-plate dry clutches, three-speed selective gearsets and full-floating rear axles. A third chassis much the same as the "32," except that a cone clutch is used, also is produced; it is not equipped with electric lighting and starting system. Wheelbases are 118 inches on 34 x 4 tires for the "40" and 113 inches on 34 x 4 tires.

Prices—For the "40": Four-passenger torpedo or five-passenger touring car, $2,000; limousine, $3,000; limousine with extra touring body, $3,400. For the "32": Roadster, $1,450; five-passenger touring, $1,500. Model W, which mounts the 32-horsepower motor but has cone clutch and no electric lighting and starting system, in five-passenger touring form, $1,350.

Changes from Previous Construction—The "32" models remain unchanged, and in the "40" models the timing gears have been replaced with "silent" chains; the magneto position has been altered and the instrument now is worm driven; Bosch dual ignition has been adopted; carburetter has been elevated and a pressure fuel system adopted; Gray & Davis electric lighting and engine starting system has been added.

Selling Points—Long-stroke motors with "silent" chain, camshaft and worm driven magnetos, pressure fuel system, high carburetter, Bosch dual ignition, three-plate dry disk clutch, three-speed selective gearset, full-floating rear axles, hand-buffed leather upholstery, deep cushions, complete equipment, Gray & Davis electric lighting and engine starting system, easily handled by ladies by reason of the starter, beautiful finish of bodies, liberal latitude for selection.

Equipment—Top with envelope and side curtains, speedometer, windshield, demountable rims with one extra, electric horn, Gray & Davis electric lighting and engine starting system (except in case of model W), tools, tire carriers, tire repair kit, pump, and jack.

MOLINE.

Moline Automobile Co., East Moline, Ill.

Models—Two models on the same four-cylinder chassis. Unit power plant, with cylinders measuring 4⅛ x 6 and rating 40 horsepower. Transmission elements include leather-faced cone clutch, three-speed selective gearset and floating type rear axle. Wheelbase is 114 inches for the roadster and 124 inches for the touring car.

Prices—Both models, $1,950.

Changes from Previous Construction—Bore of motor increased ⅛ inch, wheelbase increased 10 inches; main gasolene tank under cowl, auxiliary tank under front seat; roadster has oval gasolene tank on rear.

Selling Points—Long-stroke motor, unit power plant supported at three points, electric lighting and engine starting system, double independent ignition system, cone clutch with leather face and cork inserts; selective gearset, heavy artillery wheels, rear spokes bolted to brake drums, adequate braking surface, 12-inch upholstery, Turkish roll cushions, cellular tube radiator, straight line flush side bodies.

Equipment—Top with envelope and side curtains; one-piece windshield, complete electric lighting and engine starting system, five demountable rims, gasolene gauge on dash, tools, tire repair kit, jack, pump, and horn.

OAKLAND.

Oakland Motor Car Co., Pontiac, Mich.

Models—Twelve models on three chassis, two of which are "fours" and the third is a "six." The "six" and the larger "four" have L-head, pair-cast cylinders, the former measuring 4⅛ x 4¾ and rating 60 horsepower and the latter measuring the same and rating 42 horsepower; the smaller "four" mounts an L-head block motor, measuring 3½ x 5 and rating 35 horsepower. All have cone clutches, three-speed selective gearsets and full-floating rear axles. Wheelbases are 134 inches on 34 x 4½ tires for the "six"; 116 inches on 34 x 4 tires for the larger "four"; 112 inches on 32 x 3½ tires for the smaller "four."

Prices—For the "six": Roadster, four-, five- and seven-passenger touring car, $2,400. For the larger "four": Two- or three-passenger roadster, four- and five-passenger touring car, $1,600; coupe, $2,500; limousine, $3,000. For the smaller "four": Three-passenger roadster, $1,000; five-passenger touring car, $1,075.

Changes from Previous Construction—Both the "six" and the smaller "four" are new throughout and are exhibited for the first time; a number of refinements have been made in the larger "four."

Selling Points—Powerful motors, selective sliding gearsets, full-floating rear axles, underslung springs, low center of gravity, stability, unit power plants, cold pressed steel frames, liberal bearings, extra long springs, beautiful finish, aluminum steps, 18 coats of paint, deep upholstery, hand-buffed

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leather complete equipment, V-type German silver radiator.

Equipment—The equipment is the same for all except that the two larger cars are equipped with the Deaco electric lighting and ignition system; the "six" also has a Klaxon horn and an air engine starter. All have demountable rims, complete tool kit, tire repair kit, pump, jack, and horn.

SELDEN.

Selden Motor Vehicle Co., Rochester, N. Y.

Models—Five models built on the same four-cylinder chassis, mounting a pair-cast motor measuring 4¼ x 5 and rating 40 horsepower. Transmission elements include engine multiple disk clutch, three-speed selective gearset and full-floating rear axle. Wheelbase is 125 inches on 36 x 4 tires.

Prices—Roadster, four passenger touring, \$2,500; five-passenger touring, \$2,750; limousine, \$3,500.

Changes from Previous Construction—The principal change is in the rear axle, which has been equipped with new style gears. Formerly, brakes were both internal, but now the emergency brake is external expanding type, and the foot brake external contracting. An electric starting and lighting system has been added.

Selling Points—Selden powerful, efficient four-cycle valve mechanism, dry plate clutch, full-floating rear axle with internal and external brakes, luxurious upholstery, extremely easy springs and beautiful body lines, complete equipment, Gray & Davis electric starting and lighting system.

Equipment—Complete electric starting and lighting system, with full set of lamps, mohair top, windshield, tire carriers, tools, etc.

REO.

R. M. Owen & Co., Lansing, Mich.

Models—Four models on the same four-cylinder chassis, mounting a T-head pair-cast motor measuring 4 x 4½ and rating 30 horsepower. Transmission elements include multiple disk clutch, three-speed selective gearset and semi-floating rear axle. Wheelbase is 112 inches on 34 x 4-inch tires.

Prices—Roadster, \$1,000; touring car and toy tonneau, \$1,055; town car, \$1,750.

Changes from Previous Construction—Ball bearings have replaced some of the plain bearings; quality of materials has been increased and size of tires has been increased.

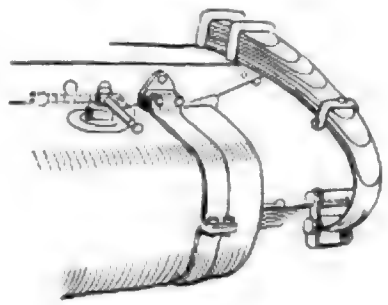
Selling Points—Flexible motor with large valves and liberal water jacketing, large amount liberal bearing surfaces, efficient cooling system, multiple disk clutch, three-speed selective gearset, semi-floating rear axle, nickel-steel drive shaft, I-beam front axle, double-acting wrapping brakes of large surface, dash carburetter adjustment, double ignition, light weight, long tire life, resilient springs, simple and strong steering gear, complete equipment; can handle gear-shifting mechanism; center control, left-hand steering, number of body styles.

Equipment—Tools, tire repair kit, demountable rims, horn, jack, and pump.

STEARNS-KNIGHT.

F. B. Stearns Co., Cleveland, O.

Models—Six models on two Knight engined chassis, one a "four" and the other a "six." Both motors have their cylinders cast in pairs, the "four" measuring 4¼ x 5½ and rating 28.9 horsepower and the "six" measuring 4¼ x 5¼ and rating 60 horsepower. Both chassis have dry multiple disk clutches and full-floating rear axles, the smaller being equipped with selective three-speed gearset and the larger with a four-speed gearset. Tire sizes are 36 x 4½ in all except closed types, which take 35 x 7 for the "four" on either 116, 121 or 127 inch wheelbase; the "six" has 37 x 5 tires on either 134 or 140 inch wheelbase.



STEARNS FUEL VALVE.

Prices—For the "four": Roadster, four- or five-passenger touring, \$3,750; seven-passenger touring, \$3,900; limousine, \$5,000; landaulet, \$5,100. For the "six": Roadster, four- or five-passenger touring, \$4,850; seven-passenger touring, \$5,000; limousine, \$6,100; landaulet, \$6,200.

Changes from Previous Construction—The "six" is a new car throughout and incorporates all of the Stearns characteristics, with few variations. Except for the addition of an electric engine starter, the substitution of a Mea magneto for the one previously used and a slight alteration in the shape of the steering gear case, the "four" is substantially the same.

Selling Features—Knight type sleeve-valve motor, "silent" chain drive for eccentric and magneto shaft drives, complete electric engine starting and lighting system, tonneau and auxiliary lamps, flush dash lamps, combined tail lamp and license plate holder, straight line flush side bodies, clear running boards with tires carried at rear, wide range of color options, hand buffed leather upholstery, long drawn curled hair and pillow springs, wide range of models and complete equipment.

Equipment—Silk mohair top with envelope and side curtains, Warner speedometer, Klaxon and bulb horns, demountable rims with two extra, auxiliary gasoline tank, tire carriers, ventilator door hooks, robe rail, foot rest, complete tool and tire repair equipment, including pump and jack.

STUDEBAKER.

Studebaker Corporation, Detroit, Mich.

Models—Four models on three chassis each, two of them mounting four-cylinder motors and the other a "six." All three motors are of the L-head block type measurements of the "six" and the "25," which is the smaller of the "fours," being 3½ x 5, and of the "35," 4⅛ x 5. All three have cone clutches, three-speed selectively operated gearsets, and the two larger models have full-floating rear axles; the "25" has a semi-floating axle. Wheelbases of the three are 120 inches for the "six" on 34 x 4 tires, 116 inches for the "35" and the "25," the former on 34 x 4 tires and the latter on 32 x 3½ tires.

Prices—For the "six": Touring, \$1,550; limousine, \$2,500. For the "35": Touring, \$1,200; coupe, \$1,850; sedan, \$2,050. For the "25": Touring, \$885.

Changes from Previous Construction—All three cars are new throughout.

Selling Points—Long stroke flexible motor, block casting, magneto mounted at front on transverse shaft, automatic oiling system, manifolds cored integral, rear axle three-speed selectively operated gearset, new type full-floating rear axle, great number of drop forgings used, Wagner electric lighting and engine starting system on larger models, acetylene primer on the "25," new body styles, including limousine, Sedan and coupe models; complete equipment.

Equipment—Top with side curtains and envelope, ventilating windshield, bulb horn, electric horn under hood, Wagner electric lighting and starting system on larger models, acetylene starter on the "25," demountable rims with an extra rim, full complement of lamps, tools, spare parts, jack, tire repair kit, foot and robe rails.

STUTZ.

Ideal Motor Car Co., Indianapolis, Ind.

Models—Five models built on two chassis, one a "six" and the other a "four." Both motors are of the T-head pair-cast type, the "four" measuring 4¼ x 5½ and the "six" 4¼ x 5. Both have multiple disk clutches, three-speed selective rear axle gearsets and floating type rear axles. Wheelbases are 124 inches for the "four" roadster, 124 inches for the "four" four- and six-passenger touring cars and the "six" roadster, and 130 inches for the "six" touring car; tires are 34 x 4½ for all.

Prices—For the "four": Roadster and four-passenger touring car, \$2,000; six-passenger touring car, \$2,050. For the "six": Roadster, \$2,250; six-passenger touring car, \$2,300.

Changes from Previous Construction—The "six" is new throughout and is exhibited for the first time; it is almost exact-

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ly similar to the "four." In the "four" the intake manifold has been water-jacketed and the wheelbase of the touring car increased four inches.

Selling Points—Electric light generator with full lighting equipment, larger Stutz rear system, with several important improvements, heavy wheels, large size tires, Timken front axle with Timken bearing and steering knuckles, low-slung, racy bodies, convertible four- and six-passenger touring cars, all straight-line bodies.

Equipment—Esterline electric lighting system, full lamp equipment, tools, spare parts, tire repair kit, horn, jack, and pump.

MARATHON.

Marathon Motor Works, Nashville, Tenn.

Models—Nine models built on three four-cylinder chassis. Motors are all of the L-head, pair-cast type and measure 3½ x 4½ for the "25," 4¼ x 4½ for the "35" and 4½ x 5½ for the "45." All have multiple disk clutches in oil, three-speed selective gearsets and full-floating rear axles. Wheelbases are 104 inches on 32 x 3½ tires for the "25," 116 inches on 34 x 4 tires for the "35," 123 inches on 36 x 4 tires for the "45."

Prices—For the "25": Roadster, $875; touring, $950 coupe, $1,050. For the "35": Roadster, $1,275; touring, $1,350; coupe, $1,600. For the "45": Roadster, $1,675; five-passenger touring, $1,750; seven-passenger touring, $1,800.

Changes from Previous Construction—Except for a number of refinements, there have been no material alterations in any of the models.

Selling Points—Simplicity of construction, few number of parts, unit power plants devoid of water and oil pumps, all moving parts enclosed, seat covers as regular equipment on all models, pockets in all doors, front doors open on either side, heavy artillery wheels, luxurious upholstery.

Equipment—Silk mohair top with envelope and side curtains, windshield, speedometer, seat covers, demountable rims with one extra, tire irons and straps, Prest-O-Lite tank, pump, tire repair kit, jack, foot and robe rails.

PAIGE-DETROIT.

Paige-Detroit Motor Car Co., Detroit,

Models—Three models on two four-cylinder chassis. Both chassis have unit power plants with L-head block cast motors, cylinder dimensions being 3¾ x 4 for the smaller and 4 x 5 for the larger, the ratings being 25 and 36 horsepower, respectively. Both have cork insert multiple disk clutches, three-speed selective gearsets and floating type rear axles. Wheelbases are 104 inches on 33 x 4 inch tires for the "25" and 116 inches on 34 x 4 tires for the "36."

Prices—The "25" roadster and five-passenger touring car, $1,000; coupe, $1,500; sedan, $1,600. The "36" touring car, $1,275.

Changes from Previous Construction—The "36" is a new car throughout and the alterations in the "25" are largely in the manner of detail refinements.

Selling Points—For the new model: Unit power plant, "silent" chain camshaft drive, cork insert multiple disk clutch, long wheelbase, enclosed valves, selective gearset, full elliptic rear springs, gasolene tank under dash, 10-inch upholstery, all dash equipment imbedded in dash; Gray & Davis electric lighting and engine starting system, roomy bodies, concealed door latches, complete equipment, wide doors.

Equipment—Top with envelope and side curtains, Stewart speedometer, demountable rims, adjustable windshield, Gray & Davis electric lighting and engine starting system, robe and foot rails, tools, tire repair kit, license brackets, pump, jack and horn.

PRATT.

Elkhart Carriage & Harness Mfg. Co., Elkhart, Ind.

Models—Three models on three four-cylinder chassis, all having unit power plants. The larger motor measures 4½ x 5¼ and rates 50 horsepower; the intermediate motor measures 4½ x 4¾ and rates 40 horsepower, and the smaller measures 4 x 4½ and rates 30 horsepower. The "40" has a cone clutch and the other two have multiple disk clutches; all have three-speed selective gearsets, the two larger models having full-floating rear axles and the "30" having a three-quarter-floating rear axle. Wheelbases are 122 inches for the "50" on 36 x 4 tires, 120 inches for the "40" on 36 x 4 tires, and 114 inches on 34 x 3½ tires for the "30."

Prices—"30," "40" and "50" in five-passenger touring model, $1,400, $1,950 and $2,150, respectively. Seven-passenger "40," $1,950; seven-passenger "50," $2,300.

Changes from Previous Construction—Other than the addition of a Gray & Davis electric lighting and engine starting system, there have been no extensive alterations.

Selling Points—French type motor, unit power plant, three-speed selective gearsets, cone and multiple disk clutches, Bosch dual ignition, Holly carburetter, irreversible steering gear, adequate braking surface, long wheelbases, resilient springs, 11-inch Turkish upholstery, Gray & Davis electric lighting and engine starting system, liberal equipment, graceful lines, beautiful finish.

Equipment—Top with envelope and side curtains, windshield, speedometer, demountable rims, complete tool equipment, tire repair kit, robe and foot rails, pump, jack, and horn. On the two larger models, Gray & Davis electric lighting and engine starting is standard. The smaller is equipped with combination Deaco lighting and ignition system and Prest-O-Lite tank.

NATIONAL.

National Motor Vehicle Co., Indianapolis, Ind.

Models—Five models built on the same four-cylinder chassis, mounting a T-head pair-cast motor measuring 4⅛ x 6 and rating 50 horsepower. Transmission elements include leather-faced cone clutch, three-speed selective gearset and full-floating rear axle. Wheelbase is 120 inches on 34 x 4½ tires for the roadster and 128 inches for the open and closed bodies on 36 x 4½ and 36 x 5 tires, according to the body.

Prices—Roadster, $2,750; small tonneau touring, $2,900; five-passenger touring, $2,9000; seven-passenger touring, $3,000; three-passenger coupe, $3,250; limousine, $3,400.

Changes from Previous Construction—Lubrication system improved, steering gear provided with spring take-up for wear, electric lighting and engine starting system added, frames strengthened, tire pump now driven by positive clutch, valve cam shapes refined.

Selling Features—Long-stroke flexible motor with enclosed valves, left-side drive with center control, Gray & Davis electric lighting and starting system, Bosch dual ignition, 12-inch Turkish upholstery, full heavy nickel trimmings, electric horn, large baggage carrying compartment, powerful and reliable brakes, spacious interior, power driven tire pump, 128-inch wheelbase, multiple jet carburetter, tire carrier at rear, full-floating rear axle, resilient springs, pressure fed gasolene supply, easy riding qualities, positive oiling system, complete equipment.

Equipment—Silk mohair top with envelope and side curtains, Hoffecker speedometer, adjustable rain vision windshield, Gray & Davis electric lighting and engine starting system, demountable rims with one extra and tire carriers, power tire pump, robe rail, foot rest and mat, tools, tire repair kit, electric horn, jack, and spare parts.

PATHFINDER.

Motor Car Mfg. Co., Indianapolis, Ind.

Models—Five models built on one four-cylinder chassis. The motor is of the L-head block type, the cylinders measuring 4⅛ x 5¼ inches and rating 40 horsepower; transmission elements include cone clutch, three-speed selectively operated gearset and full-floating rear axle. Wheelbase is 120 inches on 36 x 4 inch tires.

Prices—Torpedo cruiser, $2,000; armored roadster, $2,160; four-passenger phaeton and touring car, $2,185.

Changes from Previous Construction—Two new body styles have been added, one a "Martha Washington" coach and the other a "cruiser" roadster. Practically no mechanical alterations have been made other than the lengthening of the wheelbase to 120 inches and the addition of a Gray & Davis electric lighting and engine starting system.

Selling Points—Long-stroke Continental motor, electric lighting and engine starting system, irreversible worm and full wheel steering gear, unusually strong frame, shackle bolts ground and provided with liberal sized grease cups, long and resilient springs, option of wire wheels on "Cruiser"

model, hand buffed leather upholstery over curled hair and springs, 10-inch cushions.

Equipment—Mohair top with envelope and side curtains, rain vision and ventilating windshield, Stewart & Clark speedometer, gasoline indicator, gasolene tank gauge, demountable rims with one extra, tire carriers, tire pump, jack, horn, tire repair kit.

WHITE.

The White Co., Cleveland, O.

Models—Five models on three chassis, four of which are "fours" and the other a "six." All three motors are of the L-head monobloc type, the smaller "four" measuring 3¼ x 5½ and rating 30 horsepower, the larger "four" measuring 4¼ x 5¼ and rating 40 horsepower and the "six" measuring 3½ x 5½ and rating 60 horsepower. All three chassis have cone clutches, four-speed selective gearsets and floating type rear axles. Wheelbases are 110 inches for the "30" on 34 x 4 tires; 120 inches for the "40", on 36 x 4½ tires, and 132 on 37 x 5 tires for the "six."

Prices—For the "30": Roadster and five-passenger touring, $2,500; coupe, $3,250. For the "40": Roadster and five-passenger touring $3,300; seven-passenger touring, $3,500; coupe, $4,100; berline limousine, $4,400. For the "six": Roadster, $4,800; five- and seven-passenger touring, $5,000; private limousine, $6,300.

Changes from Previous Construction—Except that the "30" has been changed from right to left-hand drive with center control becoming uniform with all the larger models, and that the electric lighting and engine starting system now is standard on all models, no alterations have been made.

Selling Points—Long-stroke motors, valves in cylinders with intake and exhaust passages cored integral, economy in fuel consumption, absence of wiring, dynamo electric lighting and engine starting system operating at slow speed, left drive with center control, deep and luxurious upholstery, complete equipment, wide latitude for custom models, beautiful lines in closed cars, absence of angles in all models.

Equipment—Complete electric lighting and engine starting system, combination Klaxon and bulb horn, White power tire pump, robe rail, foot rail, tire holders, license brackets, complete set of tools, demountable rims with one extra, hand pump, tire repair kit, and jack.

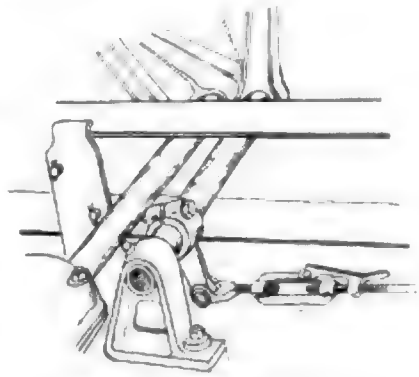
LOZIER.

Lozier Motor Co., Detroit, Mich.

Models—Twelve models built on two six-cylinder chassis. The larger, designated as Type 72, has T-head pair-cast cylinders measuring 4½ x 4½ and rating 51 horsepower, multiple disc clutch, four-speed selective gearset, full-floating rear axle, 131-inch wheelbase on 36 x 4½ front and 37 x 5 rear tires. The smaller, designated the "Light Six," has L-head cylinder cast in threes measuring 3⅜ x 5½ and rating 36 horsepower, multiple disc clutch, selective three-speed gearset, full-floating rear axle, 127½-inch wheelbase on 36 x 4½ tires.

Prices—Type 72: Roadster, four-, five and seven-passenger touring, $5,000; berline limousine and landaulet, $6,500. "Light Six": Roadster and five-passenger touring, $3,250; three-passenger coupe, $3,850; six-passenger limousine and five-passenger enclosed limousine, $4,450.

Changes from Previous Construction—The "Light Six," type 77, is a new car throughout, exhibited for the first time. In the type 72 car, motor dimensions remain the same, though the design has been altered slightly to permit of left-hand position of the steering wheel; a new oiling system and a new ignition system have been adopted.



LOZIER BRAKE ADJUSTMENT

Selling Points—On "Big Six": Triple ignition with two sets of spark plugs, automatic level oiling system ensuring smokeless exhaust at all speeds, four-speed selective transmission, direct drive on third; speed on high, 60 miles per hour and upward; ball-bearing crankshaft, with ball-bearings throughout the motor and transmission; multiple disc clutch—steel against steel—running in oil-tight case. On "Light Six": Bosch magneto and dual system of ignition, trough system lubrication combined with force feed to crankshaft bearings, combination electric starting and lighting system; starter will run the six-cylinder motor for 30 minutes; long wheelbase, combined with turning radius of 19 feet; deep Turkish upholstery and quick attachable storm curtains regulated from seat; from 3 to 50 miles per hour on direct drive.

Equipment—"Big Six" models are equipped with Gray & Davis electric lighting system, complete with headlights, dash and tail lamps; Warner speedometer, electric horn, clock, robe rail, foot rest, trunk rack, brass tire holders, a tool box and a complete set of special and regular tools, water bucket, jack, tire repair outfit, extra demountable rims, top and windshield. "Light Six" equipment includes Gray & Davis electric starter and lighting system, Warner speedometer, Waltham eight-day clock, electric horn, silk mohair top, patent quick-attachable curtains, windshield, patent tire carrier on the rear, extra rim, robe rail, foot rest and tool kit; tools are carried in a special compartment between the running board and frame, allowing clean running boards; all closed cars have electrically illuminated running boards.

PIERCE-ARROW.

Pierce-Arrow Motor Car Co., Buffalo, N. Y.

Models—Ten models on three six-cylinder chassis each. Motors are all of the T-head type, with cylinders cast in pairs, dimensions being 4 x 5½ (rating 38 horsepower), 4½ x 5½ (rating 48 horsepower) and 5 x 7 (rating 66 horsepower). All have large diameter cone clutches, four-speed selective gearsets and semi-floating rear axles. Wheelbases are 132 inches on 36 x 4½ inch tires for the "38," 142 inches on 36 x 4 front and 37 x 5 rear tires for the "48" and 147½ inches on 37 x 5 front and 38 x 5 rear tires for the "66."

Prices—For the "38": Roadster, four- and five-passenger touring, $4,300; brougham and landaulet, $5,200. For the "48": Roadster, four- and five-passenger touring, $4,850; seven-passenger touring, $5,000; brougham, landaulet, suburban and landau, $6,100; vestibule landau and suburban, $6,300. For the "66": Roadster, four- and five-passenger touring, $5,850; seven-passenger touring, $6,000; brougham, suburban, landaulet and landau, $7,100; vestibule landau and suburban, $7,300.

Changes from Previous Construction—The "38" engine dimensions have been increased from 4 x 5⅛ to 4 x 5½; in all motors the carburetter and magneto now are on the right side with the electric generator, oil pump, air starter and distributer on the left side; leather disk couplings used instead of metal for magneto and pump shaft; adjustment has been provided for the fan; screw caps over the valves in place of cover plates and screws; crankshafts are larger in diameter; connecting rod cap bolts are larger; new force-feed oiling system adopted; compressed air starter adopted; four-cylinder air compressor on the gearset; clutch now has cork inserts instead of Bronze; double universal joint between the clutch and gearset the propeller shaft is tubular instead of solid; rear axles improved, making them readily demountable.

Selling Points—Six-cylinder motors exclusively, long stroke, positive oiling system, compressed air starters, four-speed selective gearset, screw and nut steering gear, cork insert cone clutch of large diameter, Pierce-Arrow demountable rims, electric lighting dynamo with storage battery and complete equipment of electric lamps, equalized brakes, large braking surface, three-quarter elliptic rear springs, long wheelbase, tool compartments in dash, gasolene and air pressure gauges in plain sight, integral ventilating windshields, liberal amount of room in bodies, beautiful lines and finish of bodies, great variety.

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Equipment—Best quality mohair top with envelope and side curtains, Pierce-Arrow ventilating and adjustable windshield, demountable rims, speedometer, compressed air engine starter, dynamo electric lighting system, power tire pump, license brackets, tire carriers, tools, tire repair kit, pump, jack, horn, robe and foot rails, etc.

GARFORD.

The Garford Co., Elyria, Ohio.

Models—Three models on the same six-cylinder chassis, mounting an L-head, block-cast motor measuring 3¾ x 6 inches and rating 60 horsepower. Transmission elements include cone clutch; four-speed selective transmission, direct on third. Wheelbase is 128 inches on 36 x 4½-inch tires.

Prices—Touring car and roadster, $2,750; town car, $3,750.

Changes from Previous Construction—This is a new car throughout.

Selling Points—Motor of unrivaled flexibility; cylinders have detachable heads, allowing for easy and accurate machining; uniform combustion chamber, tungsten high-speed steel valves, deep channel section frame, full-floating rear axle; rear axle housing is a one-piece drop-forging; center control and left-hand drive, even distribution of weight, combination priming cup and combustion indicating device, tire pump built into motor, efficient oiling system, electric engine starter and lighter, electric heater, high-tension water-proof type magneto, ejector type manifold, tubing used instead of rods for control connections, long springs, rear springs under axle; one-piece, all-steel body welded without the use of a single piece of wood; full equipment, large tires, single head light in radiator, side lights set in dash.

Equipment—Electric engine starting, lighting and heating system, storage battery, ammeter, top and top cover, quick-folding side curtains, one-piece rain-vision, clear-vision windshield, speedometer of special design, gasolene tank gauge, electric lights, including inspection lamp and dash lamp, tools, tire repair kit, jack, horn, power tire pump, bumper, number bracket, robe rail, foot rest, tire carrier, and other similar equipment.

MITCHELL.

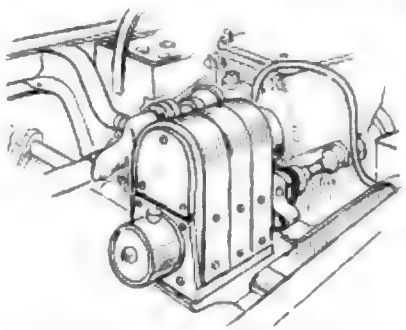
Mitchell-Lewis Motor Co., Racine, Wis.

Models—Five models built on one four- and two six-cylinder chassis. All motors are of the T-head pair-cast type, the "four" measuring 4¼ x 7 and rating 40 horsepower, the smaller "six" measuring 3¾ x 6 and rating 50 horsepower and the larger "six" measuring 4¼ x 7 and rating 60 horsepower. All have cone clutches, three-speed selective gearsets and full-floating rear axles. Wheelbases are 120 inches on 36 x 4 tires for the "40," 132 inches on the same size tires for the "50" and 144 inches on 36 x 4½ tires for the larger "six."

Prices—The 40-horsepower four-cylinder cars in roadster and five-passenger form, $1,500; smaller "six" in same form, $1,850; larger "six" in seven passenger touring, $2,500.

Changes from Previous Construction—All three cars are new throughout.

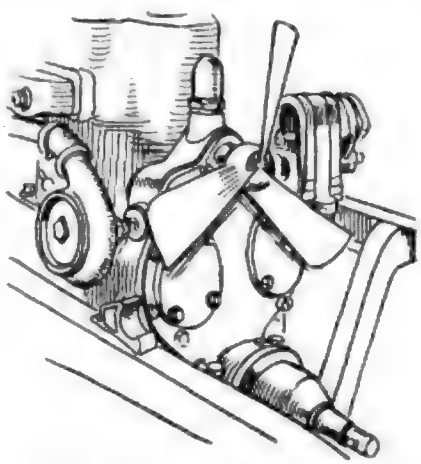
Selling Points—Exceptionally long-stroke T-head motors, complete electric lighting and engine starting system, cone clutch, noiseless three-speed gearsets, no gears in



MITCHELL DYNAMO POSITION

mesh at neutral, reverse gears stationary, except when in use, long wheelbases, ⅞ elliptic rear springs, Timken and Hyatt bearings, Rayfield carburetter, Bosch high-tension duplex ignition system, 10-inch Turkish upholstery, full-floating rear axle, drop-forged one-piece front axle, substantial wheels, 472 square inches of braking surface.

Equipment—Top with envelope and side curtains, speedometer, windshield, complete electric lighting and engine starting system, lock switch, gasolene and air gauges, Firestone demountable rims, one



FRONT VIEW MITCHELL ENGINE

extra rim, tools, pump, jack, tire repair kit, horn, foot and robe rails, tire carriers.

MARION.

Marion Motor Car Co., Indianapolis, Ind.

Models—Three models on two four-cylinder chassis, one mounting a 30-40 horsepower motor and the other a 48 horsepower motor. Both motors are of the L-head pair-cast type. The "30-40" measures 4 x 5 inches and the "48" measures 4⅛ x 5½ inches. Both chassis have cone clutches and three-speed selectively operated rear axle gearsets; the smaller has a semi-floating rear axle and the larger a full-floating axle. The wheelbases of the two chassis are 112 inches on 34 x 4 tires for the "30-40" and 120 inches for the "48" on 36 x 4 tires.

Prices—Model 48A (48 horsepower): Touring, $1,850. Model 37A (30-40 horsepower): Touring, $1,475. Model 36A (30-40 horsepower): Bobcat roadster, $1,425.

Changes from Previous Construction—A deep cowl has been added over the dash, tool boxes have been taken off the running boards, chassis has been lowered 1¼ inches new English steel springs have been adopted, brake cams have been enlarged, wood trimmings now are mahogany, steering wheel is fluted, spark and throttle controls are of the friction retained type.

Selling Points—Three point support of motor, gearset located on rear axle, Raybestos-faced cone clutch with spring inserts, exceptionally large braking surface, extra strong steering gear, low-hung chassis, new body lines, roomy tonneau, slanted seats, deep upholstery over coil springs and curled hair, Disco starter, electric light equipment.

Equipment—Mohair top with side curtains and envelope, Zig Zag windshield, Warner speedometer, electric generator for five electric lamps, Disco engine starter, storage battery, electric horn, bulb horn, foot and robe rails, tire repair kit, jack and pump.

REGAL.

Regal Motor Car Co., Detroit, Mich.

Models—Five models built on three chassis all mounting four-cylinder motors; two chassis are underslung and the third is conventional overslung. Smaller underslung chassis mounts block motor measuring 3½ x 4½ and the larger mounts pair-cast 4¼ x 4½ motor. Overslung model mounts block 4 x 5 motor. All have leather-faced cone clutches, three-speed selective gearsets and floating axles. Wheelbases are 108 inches on 32 x 3½ tires for the smaller underslung, 118 inches for the larger underslung on 34 x 4 tires, and 116 inches on same size tires for the overslung.

Prices—Smaller underslung chassis: Roadster, $900; small touring, $950; large touring, $1,400; coupe, $1,250; overslung touring, $1,250.

Changes from Previous Construction—The overslung model is a new car throughout, incorporating all of the distinctive Regal feature: Alterations in the underslung models are few and are embraced only in a general refinement of body lines, trimming and finish.

Selling Points—Flexibility of long stroke motors, enclosed valves, underslung construction, straight line drive, elimination of side lash on springs and tires, comfortable riding qualities, large roomy bodies, deep

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upholstering of finest hand-buffed leather, pano finish.

Equipment—Nickel plated trimmings, electric lights and storage battery, with equipment gas head lamps, oil side and tail lamps and Prest-O-Lite tank, full set of tools tire repair kit, demountable rims, jack, tank and tire pump. Additional standard equipment on the large underslung and overslung cars consists of top, windshield and speedometer.

SPEEDWELL.

Speedwell Motor Car Co., Dayton, O.

Models—Three models built on one six-cylinder chassis mounting an L-head motor with cylinders and measuring 4½ x 5½, rating [illegible] horsepower. Transmission consists include multiple disk clutch, three-speed selective gearset and full-floating rear axle; wheelbase is 135 inches on 36 x 4½ tires on the smaller models and 37 x 5 tires on larger models.

Prices—Four- and five-passenger touring [illegible] seven-passenger touring, $2,950.

Changes from Previous Construction—[illegible] new throughout and is exhibited for the first time.

Selling Points—Six-cylinder, long-stroke motor, three-point suspension, unit power plant, unusually stout frame, ample provision for easy mechanical adjustment, windshield as a part of the body, free and flat running boards with tool box built in the mud apron, emergency gasolene [illegible] Timken roller bearings in the steering knuckle, tie rod of extremely heavy section and behind the front axle, [illegible] road obstructions; dependable [illegible] ignition and starting system, with [illegible] furnished by dynamo; extra deep [illegible] springs, [illegible] plates of built-up type to prevent [illegible] extremely heavy and substantial [illegible] with front fender apron extending [illegible] guard, protecting the lamps; rear-[illegible] shaft drives through six splines [illegible] the ordinary square section, [illegible] chrome nickel steel is employed for [illegible] drive shafts and axle ends; [illegible] one body finish, obtained by spe-[illegible] baking; pockets in all doors, and [illegible] operative from the inside, with [illegible] and nickel knobs.

Equipment—Electric lighting and electric [illegible] system, electric horn and electric [illegible] pump, mohair top, top curtain and [illegible] with Bair patent bow separators [illegible] folding foot rail; robe rail, [illegible] with gradometer attachment; [illegible] rims and one extra, tire carrier, repair kit and tool kit inclosed in [illegible] tool box.

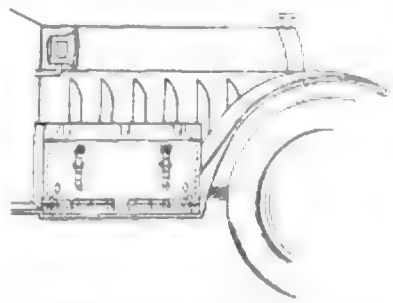
MARMON.

Nordyke & Marmon Co., Indianapolis, Ind.

Models—Six models on two chassis each, [illegible] four" and the other a "six." Both [illegible] are of the T-head type with pair-[illegible] cylinders, the dimensions being 4½ x 5 for the "32" and 4½ x 6 for the "six," which rates at 48-80 horsepower. The "four" has a cone clutch and the "six" a dry plate multiple disk clutch, and both have three-speed selective gearsets mounted on floating type rear axles. Wheelbases are 120 inches on 35 x 4½ tires for the "32" and 145 on 36 x 4½ front and 37 x 5 rear tires for the "six."

Prices—For the "four": Roadster, $2,900; four- and five-passenger touring, $3,000; speedway type roadster (without top, windshield or dash lamps but with extra tire carrier and shock absorbers front and rear), $2,850; limousine, $4,000; landaulet, $4,100. For the "six": Open bodies, $5,000; limousine, $6,250; berline limousine, $6,450; landaulet, $6,350.

Changes from Previous Construction—The "six" is a new car throughout and retains all of the Marmon characteristics. In the "32" the steering gear has been changed



MARMON RUNNING BOARD TRUNK

to the left side; an electric lighting and engine starting system has been added, complete equipment added; body lines have been altered to conform to those of the "six."

Selling Points—Liberal powered long-stroke motors, rear axle gearsets, new type of front axle, automatic forced feed oiling system, distinctive type rear axle, twin expanding brakes, long wheelbases, irreversible steering gear, full-elliptic rear springs, trunk on running board, dynamo electric lighting and engine starting system, roomy bodies with graceful lines, beautiful finish.

Equipment—Top with envelope and side curtains, windshield, speedometer, demountable rims, clock, shock absorbers, electric horn, tire carriers, robe and foot rails, trunk, tools, tire repair kit, pump, jack, horn, etc.

WARREN.

Warren Motor Car Co., Detroit, Mich.

Models—Three models on three chassis, two of which are "fours" and the third is a "six." All three motors are of the L-head type, the "six" measuring 4 x 5 and the two fours measuring 4¼ x 4¾ and 4⅛ x 4½, respectively. All have cone clutches, three-speed selective gearsets, and floating type rear axles. Wheelbases are 130 inches for the "six" on 35 x 4½ tires, 116 inches for the larger "four" on 36 x 4 tires, and 112 inches for the other "four" on 34 x 4 tires.

Prices—Seven-passenger "six" touring car, $2,500; five-passenger "40" touring car, $1,800; five-passenger "35" touring car, $1,500.

Selling Points—Long-stroke motors, new "six," cone clutches, three-speed selective gearsets, floating type rear axles, large roomy bodies, right-hand steering and control, flush-side bodies, fine finish.

Equipment—Top with envelope and side curtains, windshield, demountable rims, electric horn, tire pump, tire repair kit, jack, tools and spare parts.

WESTCOTT.

Westcott Motor Car Co., Richmond, Ind.

Models—Four models built on two chassis, one a "six" and the other a "four." The "six" has a T-head block motor measuring 4 x 6 and rating 50 horsepower, and the "four" has separately cast L-head cylinders measuring 4½ x 5 and rating 40 horsepower. Both have cone clutches, three-speed gearsets and full-floating rear axles; wheelbase of the "six" is 127 inches on 37 x 4½ tires; wheelbase of the "four" is 120 inches on 36 x 4 tires.

Prices—Four-cylinder chassis with roadster, four-passenger torpedo or five-passenger touring body, $1,975; six-cylinder chassis with five- or seven-passenger touring body, $2,475.

Changes from Previous Construction—The "six-50" is new throughout, though it is quite similar in design and construction to the "four," in which the changes are slight and are embraced in a refinement of body lines and the addition of an electric lighting and starting system.

Selling Points—Long-stroke motors, electric lighting and starting system with positive drive to the crankshaft, cone clutch and three-speed selective gearset, long wheelbases, extra large tires, extra long springs, good weight distribution and balance, luxurious upholstery over the best curled hair and springs, hand-buffed leather.

Eqiupment—Top with envelope and side curtains, windshield, speedometer, gasolene tank gauge, electric lighting and starting system, Firestone demountable rims, tools, tire repair kit, pump, jack, and horn.

INTER-STATE.

Inter-State Automobile Co., Muncie, Ind.

Models—Seven models built on three chassis. Model 45 mounts a six-cylinder block-cast motor, bore and stroke 4 and 5 inches, respectively, rated at 45 horsepower, combined in a unit with a multiple disk clutch housed in the flywheel and a four-speed selective gearset. Wheelbase is 132 inches on 36 x 4½ tires. The other two chassis are four-cylinder models with motors rated at 50 and 40 horsepower, respectively, and with dimensions of 5 x 6 and 4½ x 5½ inches; the larger has pair-cast cylinders, on the smaller the cylinders are block-cast; valves all on the same side in

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both cases. The transmission elements include a multiple disk clutch mounted in the flywheel, selective gearset and full-floating rear axle. Wheelbases are 124 inches for the "50" and 118 inches for the "40."

Prices—"45," seven-passenger touring car, $2,750; "50," seven-passenger touring car or roadster, $3,400; "40," five-passenger touring car, four-passenger demi-tonneau or two-passenger roadster, $2,400.

Changes from Previous Construction—The "45" is an entirely new production. Improvements in the smaller models have been in the way of body refinements and added equipment, which now is complete.

Selling Points—Left-hand drive and center control on the "45," noiseless rocker gear shifting device, four-speed gearset and full-floating rear axle, electric starting and lighting system, full equipment.

Equipment—Mohair top, windshield built in the body, adjustable and ventilated; speedometer and clock combination, Apico electric engine starting and lighting system, trouble lamp, usual complement of tools, horn, tire repair kit, and jack.

MERCER.

Mercer Automobile Co., Trenton, N. J.

Models—Built in seven models on two chassis, similar except for dimensions. The larger chassis mounts a T-head, pair-cast cylinder motor with bore and stroke of 4½ and 5 inches, respectively, rated at 32.4 horsepower. The smaller motor, which is rated at 30.6 horsepower, has respective dimensions of 4⅛ and 5 inches. The transmission elements of both chassis are identical and embrace a multiple disk clutch with 44 disks operating in an oil bath in a compartment integral with the gearset housing; a four-speed selective gearset and a full-floating adjustable rear axle.

Prices—Range from $2,600 to $2,900.

Changes from Previous Construction—Four-speed gearsets instead of three; separate electric lighting and starting systems on all models save the roadster; minor changes noticeable chiefly in the line of the bodies.

Selling Points—Generous sized valves, 2½ inches in diameter; concentric piston rings, freedom from vibration due to abnormally long connecting rods, 12½ inches from center to center, ball bearing cam shafts, removable from front, with cams forged integral and driven with spiral gears running in oil; combination force and splash lubrication, double spark Bosch ignition, four-speed gearset direct drive on fourth speed, full-floating rear axle, independent electric starting and lighting systems.

Equipment—Bosch magneto, usual complement of lamps, horn, jack, tire repair kit, electric lighting and engine starting systems.

BENZ.

Benz Auto Import Co., New York.

Models—Two four-cylinder chassis, the smaller mounting a block-cast motor measuring 95 mm. x 140 mm. and rating 35 horsepower, and the larger having pair-cast cylinders measuring 125 mm. x 150 mm. and rating 50 horsepower. Both have cone clutches and four-speed selective gearsets. Wheelbases are 124 inches for the "35" on 35 x 4½ tires and 131½ inches on 35 x 5 tires for the "50."

Prices—Chassis only. "35," $3,750; "50," $5,250.

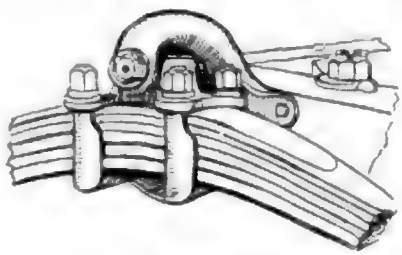
Selling Points—Long-stroke block and pair-cast motors, cone clutches, four-speed selective gearsets, semi-floating rear axles.

Equipment—Tires, spare parts, demountable rims and tools.

R. C. H.

R. C. H. Corporation, Detroit, Mich.

Models—Two models on one four-cylinder chassis, the motor being of the L-head type with block-cast cylinders, bore 3¼ inches and stroke 5 inches, rated at 25



R. C. H. SPRING HANGER

horsepower. The transmission elements include leather-faced cone clutch, selectively controlled three-speed gearset mounted on the rear axle and bevel gear final drive. The wheelbase is 110 inches. Tires 32 x 3½ front and rear.

Prices—Either roadster or touring car, $900.

Changes from Previous Construction—Except for a few minor alterations and refinements, including a hand brake and a hand throttle on the steering wheel column, there are no changes.

Selling Points—Powerful and economical long-stroke motor, roomy English type body, easy riding due to long wheelbase, and noiseless gear shifting device.

Equipment—Touring car: Five electric lamps with battery, speedometer, horn, robe rail, top, top slip cover, Jiffy curtains, rear vision mirror, tools, pump, and tire repair outfit. For the roadster: The same, with the addition of extra demountable tire and rim, locking tire holder, trunk and trunk cover.

McFARLAN.

McFarlan Motor Car Co., Connersville, Ind.

Models—Seven models on three six-cylinder chassis. The smallest motor is of T-head type, with cylinders cast in threes and measuring 4 x 5; multiple disk clutch, selective gearset, full-floating rear axle; wheelbase 124 inches on 37 x 4½ tires. The intermediate motor has pair-cast cylinders measuring 4¼ x 5 and is a unit power plant with multiple disk clutch and full-floating rear axle; wheelbase is 128 inches on 37 x 4½ tires. The largest motor has T-head cylinders measuring 4 x 6; same transmission elements as the smallest chassis. Wheelbase is 124 inches on 37 x 4½ tires.

Selling Points—Long-stroke, Six-cylinder motors, all moving parts enclosed, unit power plant in one model, extra fast roadster capable of 95 miles an hour, air-starting system, multiple disk clutches running in oil, rear axle gearsets in two models, selective gear changes, great variety in body styles, complete equipment.

Equipment—Engine starter, electric lighting system, dash light, top of silk mohair, dust hood, jack, pump, tools, demountable rims with one spare rim, tire carrier, hose for pumping tires from starting system, rain vision windshield, speedometer with gradometer, electric horn; tail light designed so license plate may be hung on it.

STEVENS-DURYEA.

Stevens-Duryea Co., Chicopee Falls, Mass.

Models—Eleven models on one chassis, built in two wheelbase lengths. Six-cylinder motor with cylinders of the L-head type, cast in pairs, 4 5/16 x 5½ inches bore and stroke. Transmission through multiple disk clutch, three-speed selectively controlled gearset and propeller shaft to full-floating rear axle. Wheelbase, 131 and 138 inches. Tires, 37 x 4½ front and rear on the roadster and five-passenger cars on the 131-inch wheelbase; 37 x 4½ front and 37 x 5 rear on seven-passenger car on 131-inch wheelbase and also on the seven-passenger car on 138-inch wheelbase.

Prices—On 131-inch wheelbase, roadster and five-passenger touring car, $4,500; six-passenger convertible phaeton and two-passenger coupelet, $5,000; seven-passenger limousine, $5,500; five-passenger demi-Berline, $5,550; seven-passenger Berline, $5,700. on 138-inch wheelbase, seven-passenger touring car, $4,750; seven-passenger convertible phaeton, $5,250; seven-passenger limousine, $5,750; seven-passenger Berline, $5,950.

Changes from Previous Construction—Increased bore and stroke of motor, longer wheelbase, newly designed spring suspension, new series of bodies.

Equipment—For both open and enclosed models, electric lighting and starting system, electric horn, bulb horn, speedometer with electric light, clock, foot and robe rails, pockets, power driven air compressor, tire carrier trunk rack, set of tools, electric trouble light, extra rim, and jack. Additional for open cars, top with side curtains and windshield.

AUBURN.

Auburn Automobile Co., Auburn, Ind.

Models—Six models on five chassis, three four-cylinder and two "sixes." Five-

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passenger touring car and roadster on four-cylinder chassis; motor 3¾ x 5¼ inches bore and stroke; wheelbase 112 inches. Five-passenger touring car on four-cylinder chassis, motor 4¼ x 4¼ inches bore and stroke; wheelbase 115 inches. Five-passenger touring car on four-cylinder chassis; motor 4½ x 5 inches bore and stroke; wheelbase 122 inches. Five-passenger touring car on six-cylinder chassis; motor 3¼ x 5¼ inches bore and stroke; wheelbase 130 inches. Seven-passenger touring car on six-cylinder chassis; motor 4½ x 5¼ inches bore and stroke.

Prices—Smallest touring car and roadster, $1,250; the two larger four-cylinder five-passenger cars, $1,525 and $1,800, respectively; the five-passenger six-cylinder car, $2,150; seven-passenger six-cylinder, $2,300 and $3,000.

Equipment—Four-cylinder models: Top, windshield, gas headlights, oil side and tail lamps, speedometer and tools. Six-cylinder models the same, with electric lighting throughout, current supplied by an automatic dynamo.

GREAT WESTERN.

Great Western Automobile Co., Peru Ind.

Models—Four models on the same four-cylinder chassis, mounting an L-head motor measuring 4½ x 5½ inches and rating 40 horsepower. Transmission elements include full-floating rear axle; wheelbase is 118 inches on 30 x 4 tires.

Price—$1,585.

Changes from Previous Construction—Nickel-plated trimmings throughout, numerous body refinements, upholstery deep-tufted, automatic lighting and Presto-Starter added.

Selling Points—Long-stroke motor, accessible unit power plant, enclosed valves all on one side, 118-inch wheelbase, gasoline tank gauge, deep upholstering, with hand-buffed leather, invisible coil with lock switch, full-floating rear axle with large New Departure and Hyatt bearings, large and powerful double internal expanding brakes, tie rod behind front axle, cellular radiator, latest Remy magnetos with key switch, easy riding Vanadium steel springs, handsome body, 18 processes of hand finish.

Equipment—Silk mohair top with side curtains and envelope, Stewart speedometer, Ventilating windshield, demountable rims, Typhoon electric horn, foot and robe rails, tools, tire repair kit, jack, and pump.

McINTYRE.

W. H. McIntyre Co., Auburn, Ind.

Models—Several models on one four- and one six-cylinder chassis. The "six" mounts a unit power plant in which the motor cylinders are cast in a block and measure 3½ x 4½; rating is 40 horsepower. Transmission elements include multiple disk clutch to rear four-speed selective gearset, full-floating rear axle. Wheelbase is 120 inches on 34 x 3½ tires.

Prices—Five-passenger "six" touring car, $1,485.

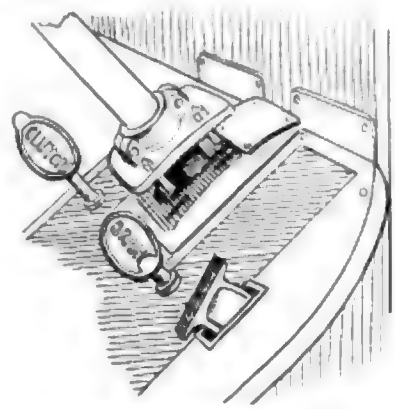
Selling Points—Long-stroke block motor, all moving parts enclosed, engine starter, multiple disk clutch running in oil, four-speed gearset, single lever center control, right-hand steering and complete equipment.

Equipment—Top with envelope and side curtains, folding wind-shield, speedometer, electric signal, automatic head lamp lighter, gas engine starter, demountable rims with one extra, eight-day dash clock, tire pump, jack, license brackets, tire carriers, tools, spare parts, foot and robe rails, dust cover for entire car.

RAMBLER.

Thomas B. Jeffery Co., Kenosha, Wis.

Models—Five models built on the same four-cylinder chassis. Cylinders are separately cast L-head and measure 4½ x 5, rating 42 horsepower. Transmission elements include cone clutch, three-speed selective gearset and floating rear axle. Wheelbase is 120 inches on 36 x 4 and 37 x 4½ tires.



RAMBLER ADJUSTABLE COLUMN.

Prices—Roadster, $1,815; four- or five-passenger touring, $1,875; sedan coupe, $2,575; Gotham limousine, $2,825; special five-passenger, with 37 x 4½ tires, $2,075.

Changes from Previous Construction—Upholstery deepened to 10 inches, turning radius reduced, countershafts for brakes and gear shift combined, bodies roomier, finish in nickel plate, paintwork improved.

Selling Points—Electric lighting and starting system combined in unit with motor; separately cast cylinders, multiple disk clutch with spring inserts, three-speed selective gearset, Rambler floating rear axle, deep, strong frame, low center of gravity, drive shaft, gearset and axle in unit, demountable wheels, wide doors, deep upholstery, large windows in closed cars, 96 per cent. of all parts made in Rambler factory, guaranteed 10,000 miles, beautiful finish, distinctive appearance.

Equipment—Mohair top with envelope and side curtains, windshield, speedometer, complete dynamo electric lighting and engine starting equipment (U. S. L. system), electric head, side and tail lamps, complete tool equipment, hinged robe rail, adjustable foot rail; roadster, trunk, with two suit cases.

EMPIRE.

Empire Automobile Co., Indianapolis, Ind.

Models—One model on one four-cylinder chassis. Motor, 25 horsepower, with cylinders cast in pairs. Transmission system includes disk clutch, three-speed selectively controlled gearset and shaft drive to semi-floating rear axle. Wheels 32 inches in diameter.

Price—Five-passenger touring car, $950.

Selling Points—Simplicity of construction and ease of control, set spark, centrally placed gear-shift lever, inside door handles, complete equipment.

Equipment—Top and top cover, side curtains, windshield, speedometer, gas tank head, side and tail lamps, horn, and full set of tools.

POPE-HARTFORD.

Pope Mfg. Co., Hartford, Conn.

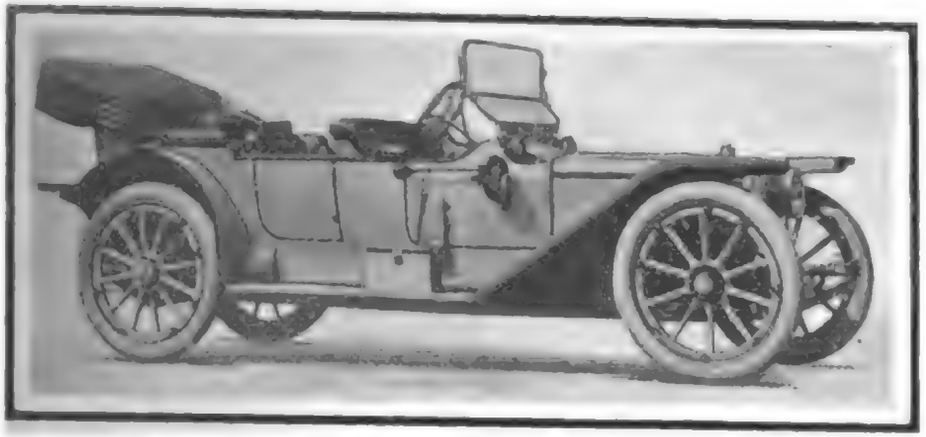
Models—Nineteen models, built on three chassis, two of which are four-cylinder and one a six. The smallest four-cylinder motor is of 40 horsepower and measures 4 5/16 x 5½, and the larger of 50 horsepower and measures 4 5/16 x 5½. The "six" is of 60 horsepower, the dimensions being 4¼ x 5½. Transmission elements in all three chassis models include cone clutch, four-speed selectively controlled gearset and final drive by shaft and bevel gears. Wheelbases, smaller "four," 118 inches, with 56-inch tread; larger "four," 124 inches, 56-inch tread; and the "six," 133 inches, with 56-inch tread. Tires on both four-cylinder models, 36 x 4½ front and rear; on the "six," 37 x 5 inches front and rear.

Prices—On the small four-cylinder chassis, five-passenger touring car, four-passenger phaeton and roadster, $2,250; five-passenger limousine, $3,250; three-passenger coupe, $2,850. On the larger "four," five-passenger touring car, $3,250; seven-passenger touring car, $3,500; five-passenger phaeton and roadster, $3,250; seven-passenger limousine and seven-passenger landaulet, $4,300; seven-passenger Berline, $4,550; on the six-cylinder chassis, seven-passenger touring car, five-passenger phaeton and roadster, $4,250; seven-passenger limousine and seven-passenger landaulet, $5,300; three-passenger coupe, $4,800; seven-passenger Berline, $5,550.

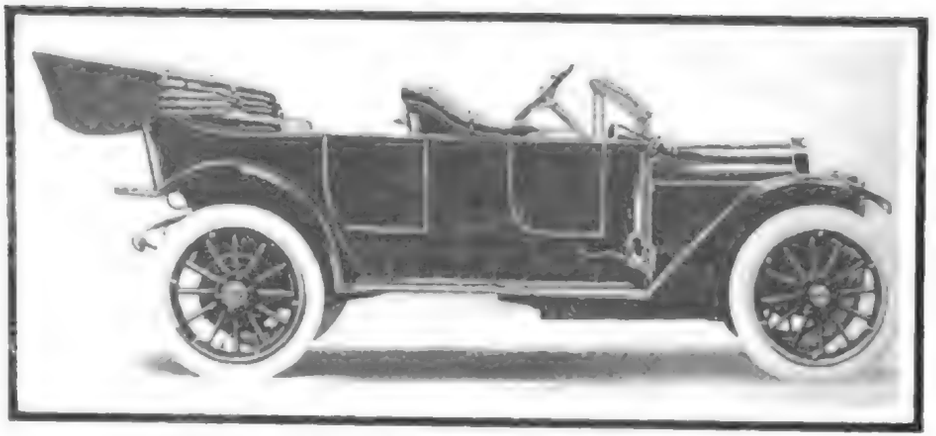
Changes from Previous Contsruction—Lower hung frame; side members narrowed at front, permitting shorter turning; new four-speed roller bearing gearset; stronger and better rear axle.

Equipment—Top curtains and top cover, windshield, electric head, side and tail lamps, electric starting and lighting system, with separate motor and generator units, horn, foot and robe rails, trunk rack,

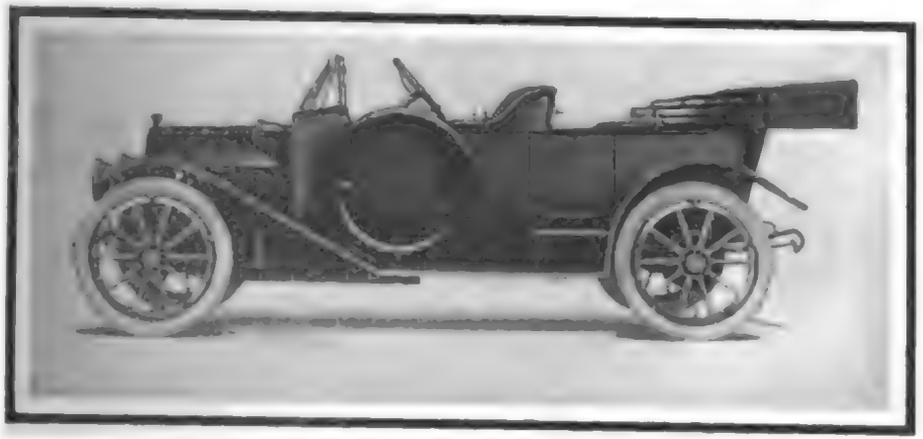
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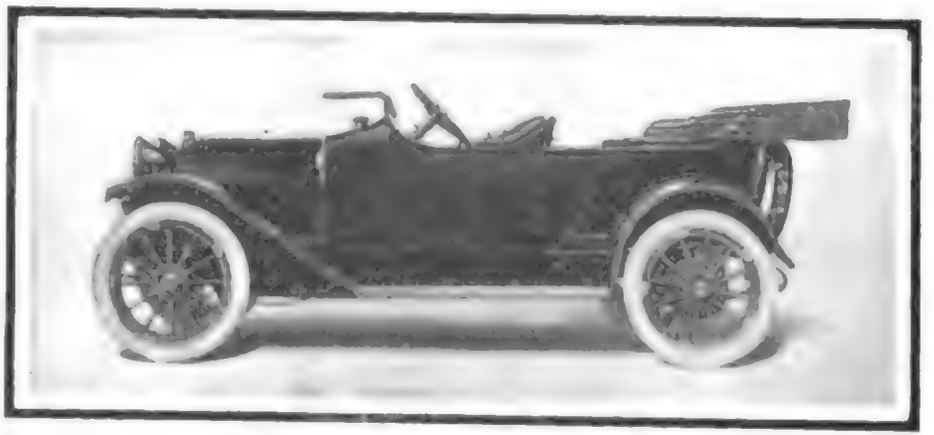
SIX-PASSENGER UNDERSLUNG AMERICAN TRAVELER



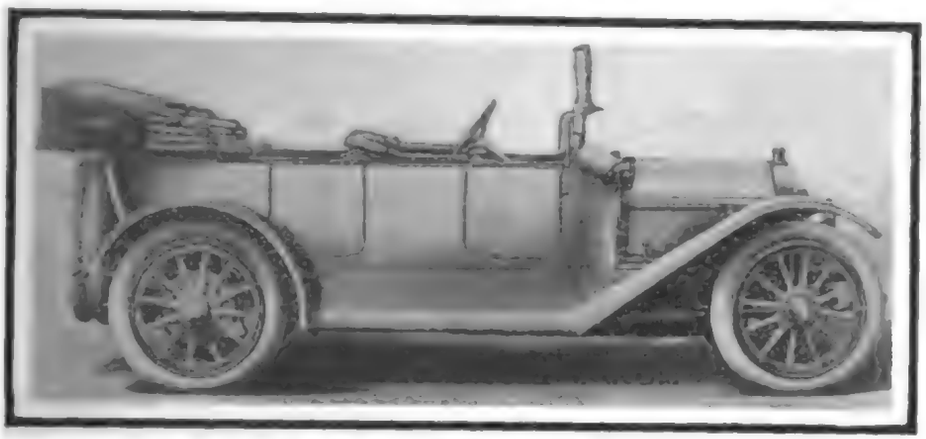
PULLMAN "4-44" EQUIPPED FOR THE ROAD



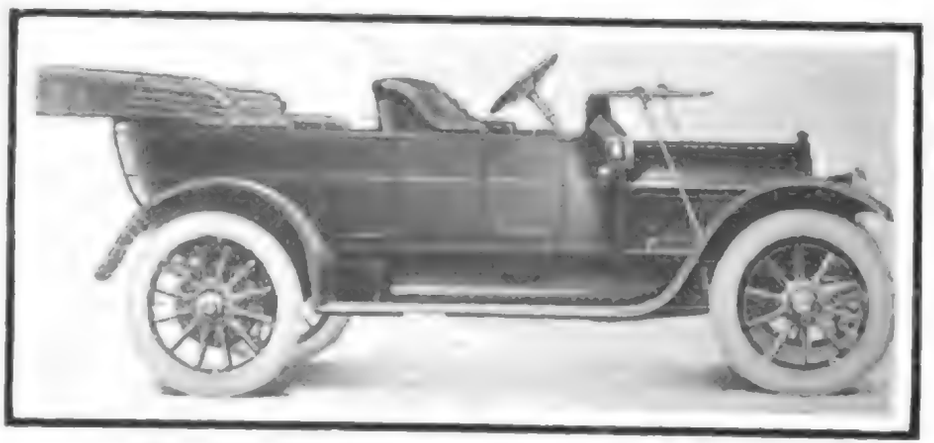
HERRESHOFF FOUR-CYLINDER TOURING CAR MODEL



PAIGE-DETROIT TOURING CAR LISTING AT $1,275



NEWEST MODEL MERCER FIVE-PASSENGE R CAR



SIDE VIEW OF CADILLAC FOUR-PASSENGER TORPEDO

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[illegible] rims, tool box, tools, spare rim, tire [illegible] and pump

MOON.

Moon Motor Car Co., St. Louis, Mo.

Models—Three models on three chassis [illegible] save as to dimensions. The "65," largest, mounts a T-head motor, 4 x 5¼ bore and stroke; transmission elements include a multiple disk clutch, selective three-speed gearset and full-floating rear axle. Wheelbase is 132 inches on 36 x 4 tires. The "48" has bore and stroke of 4 x 5 inches; wheelbase, 121 inches on 34 x 4 tires. The "39" has a 116-inch wheelbase on 34 x 4 tires.

Prices—"65," five-passenger touring or [illegible]-passenger torpedo, $2,500; "48," five-passenger touring or four-passenger touring, [illegible]; "39," five-passenger touring or [illegible]-passenger torpedo, $1,650.

Selling Points—Full-floating rear axle with extra strong differential mounted on [illegible] bearings; special cold pressed [illegible]-size spokes, quick detachable-tire [illegible] wheels, quality of upholstering and [illegible] mounting, Moon-Wagner electric lighting and starting system.

Equipment—Complete complement of [illegible] tools, tire repair kit, jack, quick [illegible] demountable rims, electric [illegible] and lighting system.

PREMIER.

Premier Motor Mfg. Co., Indianapolis, Ind.

Models—Two models on two six-cylinder [illegible] mounting T-head motors: the [illegible] measures 4½ x 5¼ and is pair cast, [illegible] smaller measures 4 x 5 and is cast in [illegible] of three. Both have multiple disk [illegible] and three-speed selective gearsets; [illegible] of smaller car is three-quarter [illegible]. Wheelbase of the "Little Six" is [illegible] on 36 x 4½ tires, and of the "Big [illegible] inches on 37 x 5 tires.

Prices—Big Six," $4,000; "Little Six," [illegible]

Changes from Previous Construction—[illegible] Little Six" is a new car throughout; [illegible] changes have been made in the older [illegible]

Selling Points—Six-cylinder motors with [illegible] cylinders; extremely large crankshaft; 45 horsepower at 1,400 revolutions a [illegible] complete dynamo electric lighting [illegible] pneumatic engine starter; 132-inch [illegible] power tire inflator; luxurious [illegible] clear running boards; gasolene [illegible] filler between front seats.

Equipment—Dynamo electric lighting [illegible] pneumatic engine starter; power [illegible] starter; Firestone demountable quick [illegible] rims, tools; tire repair kit; jack [illegible]

MIDLAND.

Midland Motor Co., East Moline, Ill.

Models—Two models built on two chassis. The larger, a six, has a T head motor, with bore and stroke dimensions of 4 and 5 inches respectively; full floating rear axle. Wheelbase is 135½ inches on 36 x 4 inch tires. The smaller, the "4-40," mounts a T head motor with bore and stroke of 4⅛ x 5 inches, and has a wheelbase of 122 inches on 34 x 4 inch tires.

Prices—"6-50," $2,385; "4-40," $1,685.

Changes from previous construction—The six cylinder model is a new production. On the four the most notable improvement is the addition of the Gray & Davis motor starting and lighting system and chassis and body refinements.

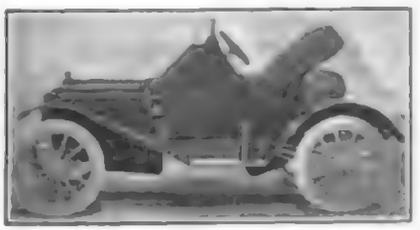
Selling points—Unit power plants; three point suspension; demountable rims, left-hand drive and center control, full floating rear axle, electric lighting and starting system and equipment.

Equipment—Electric head, side and tail lamps; Gray & Davis electric starting and lighting system; usual complement of tools; tire repair kit and horn, jack, demountable rims, with one extra.

METZ.

Metz Co., Waltham, Mass.

Models—One model on one four-cylinder chassis mounting a block motor measuring 3¼ x 4 and rating 22 horsepower. Transmission by Metz friction system; wheelbase is 90 inches on 30 x 3 tires.



METZ, THE LOWEST PRICED CAR, $395

Price—Roadster model, $395.

Changes from Previous Construction—It is a new car throughout.

Selling Points—Thermo-spihon water cooling, Bosch high-tension magneto, constant level oiling system, left-hand drive with center control, friction transmission, eliminating gears and permitting unlimited speed changes; heavy artillery wheels, full-elliptic springs, accessibility, simplicity, satisfaction, economy, good hill climber, complete equipment.

Equipment—Top with envelope, windshield, gas lamps and generator, Bosch magneto, dash lamps, tail lamp, tools, horn, tire repair kit, pump, and jack.

GLIDE.

Bartholomew Co., Peoria, Ill.

Models—Ten models on two four-cylinder chassis. The larger mounts a motor with separately cast L-head cylinders measuring 4¼ x 5 and rating 45 horsepower, and the smaller has a block L-head motor measuring 4⅛ x 5¼ and rating 36-42 horsepower. Both have multiple disk clutches, three-speed selective gearsets and floating type rear axles. Wheelbases are 120 inches for the "45" on 36 x 4½ tires, and 118 inches on 34 x 4 tires for the "36-42."

Prices—For the "45": Five-passenger torpedo, $2,150; seven-passenger touring car, roadster, and four-passenger touring car, $2,000; seven-passenger torpedo, $2,250; limousine, $3,000; landaulet, $3,000; coupe, $2,500. For the "36-42": roadster or five-passenger touring car, $1,600.

Changes from Previous Construction—In the "36-42," motor dimensions increased from 4¼ x 5 to 4⅛ x 5¼; wheelbase increased 4 inches; electric lighting system added; power driven air pump added; heavier steering gear; new pressed steel rear axle housing, bevel gears increased in size. No changes in larger model.

Selling Points—Combined water and air cooling in the larger motor; and in the smaller car: automatic dynamo lighting system; motor driven tire pump; left side drive with center control; narrow fore frame permitting short turning radius; new improved long-stroke motor; enclosed valves; electric side lamps set into dash; engine starter; unit power plant; 118-inch wheelbase; Baker bolted on demountable rims; Goodyear tires.

Equipment—Top with envelope and side curtains; windshield; Stewart speedometer; power driven tire pump; electric lighting system; Baker demountable rims and one spare, tire carriers; grade indicator; tools; tire repair kit; jack and horn.

IMPERIAL.

Imperial Automobile Co., Jackson, Mich.

Models—Five models on four chassis, three four-cylinder and one "six." Roadster and five-passenger touring car built on 114-inch wheelbase; motor four-cylinder, 40 horsepower, L-head cylinders cast in pairs, 4⅛ x 5½ inches bore and stroke. Another five-passenger touring car is built on a 118-inch wheelbase, with motor of 4½ x 5¼ inches bore and stroke, pair-cast, L-head cylinders. A wheelbase of 122 inches carries a third five-passenger touring car, the motor being four-cylinder, 4¾ x 5¼, with pair-cast L-head cylinders. The six-cylinder model has a motor of 4 inches bore and 5½ inches stroke, wheelbase 137 inches. Multiple disk clutches running in oil and three-speed selectively controlled gearsets are found in all models.

Prices—Roadster and small touring car, $1,285; five-passenger touring cars on 118 and 122-inch wheelbases, $1,650 and $1,875, respectively; six-cylinder car, $2,500.

Equipment—Top, windshield, speedometer, tire holders, demountable rims, lamps, horn, and tools.

PATERSON.

W. A. Paterson Co., Flint, Mich.

Models—Three models on two four-cylinder chassis. Both motors have pair-cast L-head cylinders and unit construction, the

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smaller measuring 4¼ x 4½ and rating 40 horsepower and the larger measuring 4½ x 5¼ and rating 45 horsepower. Both have cone clutches, three-speed selective gearsets and full-floating rear axles. Wheelbases are 116 inches on 34 x 4 tires for the smaller and 120 inches on 36 x 4 tires for the larger.

Prices—Model 41, 40-horsepower, five-passenger touring, $1,500; equipped with acetylene starter and Deaco electric lighting system, $1,600; equipped with Deaco electric lighting and starting system, $1,685. Model 47, 45-horsepower, seven-passenger touring, $1,985.

Changes from Previous Construction—Model 41 is a new car throughout and is the same as model 43 except that the latter is equipped with electric lights and electric starter and the former with electric lights and gas starter. Model 47 remains unchanged, except that an electric lighting and engine starting system has been added to the equipment.

Selling Points—Unit power plant construction, three-point support, fully enclosed and adjustable valve mechanism, control levers arranged to give free access to both front doors; long wheelbases; attention paid to proper upholstering; comfort and good riding qualities.

Equipment—Mohair top with envelope and side curtains, Deaco electric lighting system on model 43, Deaco lighting and engine starting on model 47; speedometer, demountable rims, horn, jack, tools, tire repair kit, jack and pump.

KRIT.

Krit Motor Car Co., Detroit, Mich.

Models—Three models built on the same chassis, which mounts an L-head block-cast motor measuring 3¾ x 4 inches; transmission elements include multiple disc clutch, three-speed selective gearset and floating rear axle. Wheelbase is 106 inches on 32 x 3½ inch tires. Also one "six," details and prices of which have not yet been fully decided.

Prices—Five-passenger touring or roadster model, $900.

Changes from Previous Construction—Valves have been enclosed and fitted with adjustable tappets, grease lubrication replaces oil lubrication in gearset, motor is provided with an integral oil reservoir in the crankcase, brass parts now are nickeled and the touring body is of the shrouded dash type. The "six" is a new car throughout.

Selling Points—Ball-bearing motor, extra large crankshaft with liberal-sized connecting rod bearings, self-adjusting multiple disc clutch in oil, three-speed selective gearset, unusually large gears with shafts mounted in ball bearings, completely enclosed unit power plant with positive oiling system, underslung spring construction, high tension magneto, external contracting service brakes protected by housing forged integral with axle, thereby eliminating clips; large braking surface.

Equipment—Mohair top with envelope and side curtains; rain-vision windshield; option of Prest-O-Lite tank or Stewart speedometer and generator; Detroit demountable rims with one extra and tire irons, tools, tire repair kit, pump, jack and horn.

STAVER.

Staver Carriage Co., Chicago, Ills.

Models—Three models on three chassis, two of which are "fours" and the third is "six." The four-cylinder motors are rated at 45 and 55 horsepower respectively., and measure 4½ x 5 and 4½ x 6 inches, and the "six" is rated at 70 horsepower and measures 4 x 6. All have multiple disk clutches and three-speed selective gearsets; rear axles are full-floating. Wheelbases are 138 inches for the "six" on 37 x 4½ tires; 120 inches for the "4-55" on 36 x 4 tires; and 118 inches for the "4-45" on 34 x 4 tires.

Prices—"Six" six-passenger touring car, $2,750; "4-45" five-passenger touring car, $1,875; "4-55" five-passenger touring car, $2,250.

Changes from previous construction—Both the "six" and the larger "four" are new throughout.

NORWALK.

Norwalk Motor Car Co., Martinsburg, W. Va.

Models—Five models on two six-cylinder chassis, both motors being of the T-head type with the cylinders cast in threes. The larger measures 4¼ x 5½ and the smaller 4 x 5. Both have multiple disk clutches, the smaller having a three- and the larger a four-speed selective gearset; both have full-floating rear axles. Wheelbases are 127 inches on 38 x 4½ tires for the smaller, 136 inches for a special model built on the smaller chassis and equipped with 40 x 4½ tires, and 144 inches on 41 x 5 tires for the larger "six."

Prices—For the smaller chassis: Roadster and five-passenger touring car, $2,750; special model four-passenger "tourer," $3,000; six-passenger "tourer," $3,100. For the larger chassis: Four-passenger, $3,650; six-passenger, $3,750.

Changes from Previous Construction—Former L-head, pair-cast motor replaced by unit power plant with T-head cylinders cast in pairs; new pressed steel rear axle.

Selling Points—Only six-cylinder underslung car; long stroke motor, complete electric lighting and engine starting system, low center of gravity, great stability, four-speed gearset, full-floating rear axle, center control, complete equipment, straight-line drive, three-point suspension of motor, extra large equalized brakes.

Equipment—Top with envelope and side curtains, Zig-Zag windshield, speedometer and clock, Gray & Davis electric lighting and starting system, demountable rims, tools, tire repair kit, foot and robe rails, pump and jack.

WINTON.

Winton Motor Carriage Co., Cleveland, O.

Models—Six models built on the same six-cylinder chassis. The motor has L-head pair-cast cylinders measuring 4½ x 5 inches and rates at 48.6 horsepower. Transmission elements include oil bath multiple disc clutch, four-speed selective gearset and full-floating rear axle; wheelbase is 130 inches on 36 x 4½ inch tires.

Prices—Roadster, $3,000; touring, $3,000; small tonneau touring, $3,000; three-quarter limousine, $4,250; enclosed limousine, $4,500; landaulet, $4,500.

Selling Points—Six cylinders, compressed air starting and tire inflating system, high ratio of power to weight, large tires, low maintenance cost, readily adjustable control pedals, screw and nut steering gear, three quarter elliptic rear springs.

Changes from Previous Construction—Body lines have been refined and smoothed down and three-quarter elliptic springs have been substituted for the semi-elliptic members used heretofore.

Equipment—Two gas head lamps, two electric side lamps, one electric tail lamp, gas tank or generator; 6-volt 60-ampere-hour storage battery, demountable rims. Top, windshield, speedometer, etc., are extra equipment

Electric Pleasure Cars

ARGO ELECTRIC.

Argo Electric Vehicle Co., Saginaw, Mich.

Models—Two models built on the same chassis. Drive is by shaft, the motor being mounted directly on the rear axle. Battery equipment consists of 30 cells 15-plate Exide. Wheelbase is 110 inches for the brougham on 36 x 4 tires and 86 inches for the town car on 34 x 3 tires.

Prices—Brougham, $2,800.

Selling Points—Westinghouse motor, long wheelbase, resilient springs, roomy bodies, shaft drive, unit motor and rear axle assembly, substantial construction, simplicity, non-arcing constant torque controller.

Equipment—Ampere hour meter with totalizing and trip dials, properly sealed against tampering; odometer giving trip and total miles, trip and total hours; electric horn, complete toilet and card case, complete outfit of tools, and jack.

DETROIT ELECTRICS.

Anderson Electric Car Co., Detroit, Mich.

Models—Eight models on one electric chassis. Drive is direct by shaft to bevel gear on rear axle, which is of the floating type; lever steer and control.

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Prices—Clear Vision Brougham, $3,000; Model 37 brougham, $3,600; Extension brougham, $2,850; Model 36 brougham, $2,700; roadster coupe, $2,500; limousine, $5,000; roadster, $2,350; victoria, $2,300.

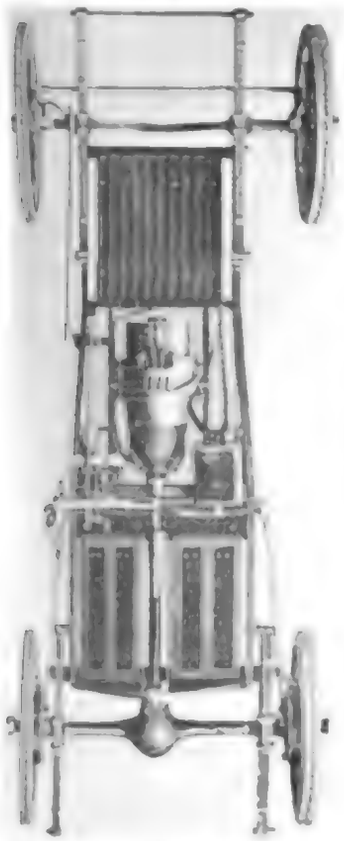
Selling Points — Horizontal controller lever, five speeds and reverse, special Detroit motor, electric brakes, two sets hub brakes, direct shaft-driven chainless power plant, lead or nickel batteries, aluminum window sashes.

Equipment—Head and side lamps, tail and inspection lamps, hub odometer, complete outfit of tools, flower vases and toilet cases.

CHURCH-FIELD ELECTRIC.

Church-Field Motor Co., Sibley, Mich.

Models—Two models built on the same electric chassis, mounting a Wagner motor



CHURCH-FIELD ELECTRIC CHASSIS

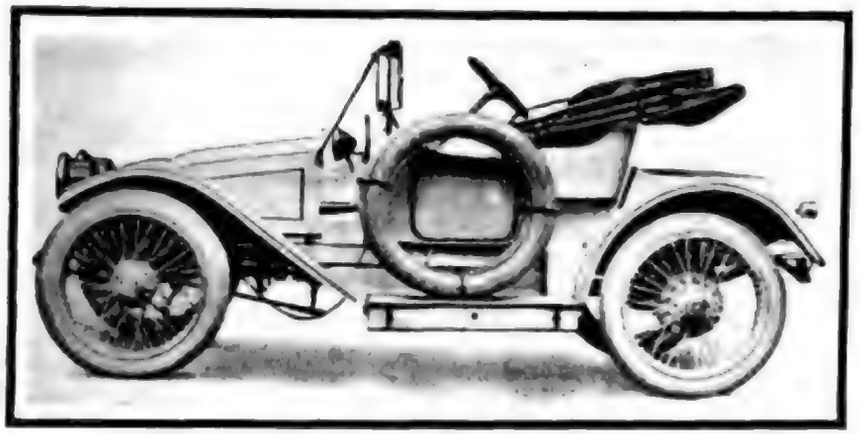
and equipped with either 24 cells of 19-plate, WTX of 26 cells of 17-plate, WTX Philadelphia battery; Exide, Exide Hycap, Ironclad Exide, or Edison battery furnished at slight additional cost. Drive is by shaft through a two-speed planetary gearset and straight shaft to bevel gearing on the rear axle, which is of the floating type. Tires are solid 36 x 4, on the brougham, and 36 x 4 special pneumatic for the roadster.

Prices—Roadster, $2,300; four-passenger, brougham, $2,800.

Changes from Previous Construction—Minor refinements only, the car being exhibited for the first time.

Selling Points — Two-speed planetary transmission, arrangement of transmission clutches and brakes, ten-point speed control, arrangement of current and speed levers in both roadster and brougham, safety locking and interlocking devices on the current control lever, current dial, convenient arrangement of electric light control, exclusive Church-Field springs (reverse three-quarter elliptic), scientific distribution of weight, beauty and distinction of design, smaller refinements and conveniences in equipment, underslung frame.

Equipment — Brougham: Two focusing head lights, two Colonial pillar lamps, two inside dome lights, one tail lamp, Klaxonet horn (electric bell optional), volt-ammeter, odometer, ladies' toilet case, gentlemen's smoking case, cut glass flower vase, eight-day Swiss clock, charging plug, tool case, jack, and oil can. Roadster Windshield, mohair top with boot, two focusing head lights, one tail lamp, Klaxonet horn, volt-ammeter, speedometer, eight-day Swiss clock, charging plug, tool case, pump, tire repair outfit, jack, and oil can.



BUFFALO ELECTRIC ROADSTER EQUIPPED WITH WIRE WHEELS

BUFFALO ELECTRICS

Buffalo Electric Vehicle Co., Buffalo, N. Y.

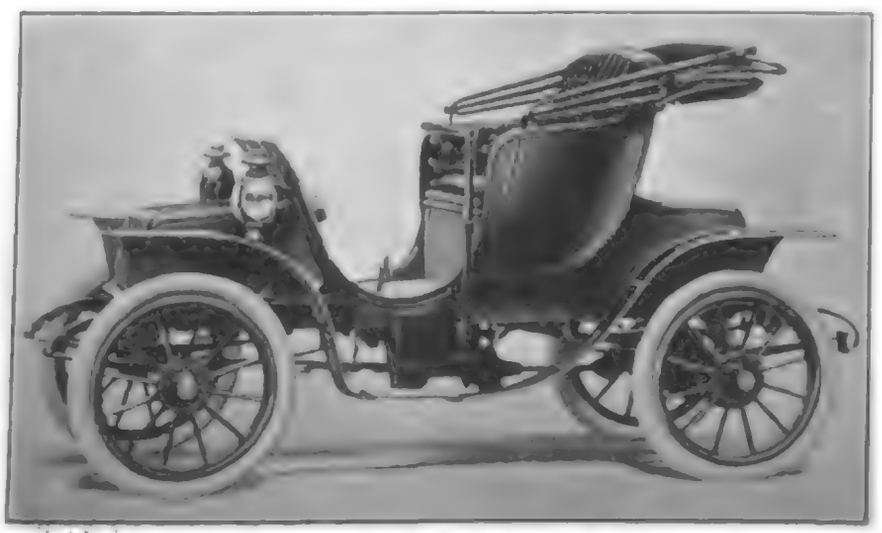
Models—Three models built on the same chassis, which is equipped with a Diehle 20-horsepower motor and 42 cells of 15-plate Philadelphia battery. The three models are the same, except that the coupes have lever steer as standard equipment, with wheel steer optional, and the roadster is equipped with wheel steer; lever steel is optional. The chassis has a single reduction shaft drive and the rear axle is of the full-floating type.

Prices—Roadster, $2,600; model 29, four-passenger coupe, $3,300; model 30B, four or five-passenger coupe with all seats facing forward, $3,400.

Changes from Previous Construction—Except for a new type of rear axle and a new sloping hood over the front battery tray, the chassis is substantially without alteration.

Selling Points—Single reduction shaft drive; foot control; irreversible steering with either lever or wheel; aluminum body construction; French type hood; deep cushions; resilient springs; full equipment.

Equipment—Model 29 has a complete electric lighting equipment, including head, side and tail lamps; windshield, speedometer; top, side curtains and envelope; volt and ammeters; Klaxonette horn; detachable or demountable rims; McCue wire



BROC ELECTRIC VICTORIA SHOWING STRAIGHT SHAFT DRIVE

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wheels optional; tools, tire repair kit, and jack. The coupe equipment is the same, except that no head lamps are spuplied and the warning signal is a bell; vases and slip covers for the cushions are provided.

BORLAND ELECTRIC.

Borland-Grannis Co., Chicago, Ill.

Models—Five models on the same electric chassis mounting a General Electric motor and driven by shaft. Battery consists of 40 cells of 9-plate Exide for all except the roadster model, which has 42 cells of 11-plate Exide, and the limousine, which has 42 cells of 19-plate Exide. Wheelbases are 93 inches for the brougham and semi-Colonial coupe on 34 x 4 pneumatic or cushion tires; 96 inches for the Colonial coupe and the roadster on 34 x 4 tires, and 123 inches for the limousine.

Prices—Brougham, $2,500; roadster, $2,550; semi-Colonial coupe, $2,700; Colonial coupe, $2,900; limousine, $5,500.

Changes from Previous Construction—All except the Brougham are new models throughout, though changes of only minor importance have been made in the chassis.

Selling Points—Wide range for choice in body styles; high efficiency General Electric motor; continuous torque six-speed controller, interlocking device on current control, liberal battery capacity, great mileage, beautiful lines, complete equipment.

Equipment—All closed cars: Head and side and tail lamps, odometer, volt and ammeters, complete outfit of tools, hydrometer, flower vase, toilet case, umbrella to match upholstery, skid chains. Roadster: Windshield, Klaxonet horn, chains. Limousine: Adjustable top to protect driver.

RAUCH & LANG ELECTRIC.

Rauch & Lang Carriage Co., Cleveland, O.

Models—Six models on three chassis. Brougham, colonial brougham, club roadster and roadster on 92-inch wheelbase with tires 33 x 4½ cushion or 32 x 4 pneumatic. Battery, 40 cells, 11 plates. Coach, 103-inch wheelbase, same tire and battery equipment. Demi-brougham, 86-inch wheelbase, same tire equipment; battery, 40 cells, 9 plates.

Prices—Brougham, $2,900; colonial brougham, $2,900; coach, $3,100; club roadster, $2,800; roadster, $2,600; demi-brougham, $2,800.

Equipment—Side, head and tail lamps, dome light, rain vision shield, odometer, flower vase, toilet case, and set of tools.

BROC ELECTRIC.

Broc Electric Vehicle Co., Cleveland, O.

Models—Four models on two electric chassis, which are the same except in wheelbase length, one measuring 84 inches and the other 96 inches. Lever steer is standard on all with wheel steer optional on the roadster. All are equipped with 40 cells of 11-plate Exide battery except the roadster, which has 28 cells. Tires may be either 34 x 4 special electric pneumatic or 36 x 4 cushion, except on the roadster, which is equipped with either 32 x 3½ pneumatic or 34 x 3½ cushion tires.

Prices—Stanhope open, $2,000; Victoria open, $2,050; brougham, $3,000; brougham with revolving driver's seat, $3,100; forward drive brougham, $3,100.

Changes from Previous Construction—Except for minor improvements, there have been no alterations in construction.

Selling Points—Lever steer; well designed and properly located seats, new locking device on current control, perfect spring suspension, high efficiency motor, complete equipment.

Equipment—Open and closed cars: Klaxet or electric bell, storm curtain and apron, two each side and head lamps, meter lamp, charging plug, odometer, volt and ammeter, pump, tire repair kit, and tools. Closed cars have, in addition: Cylinder door locks, cut glass flower vase, toilet case with mirror, memorandum book, bottles, and brush.

STANDARD ELECTRIQUE.

Standard Electric Car Co., Jackson, Mich.

Models—One model on one electric chassis mounting a Westinghouse motor and 30 cells of 11-plate Exide battery; controller is of continuous torque type and provides six forward and three reverse speeds; drive is straight shaft with double reduction to bevel gearing. Wheelbase is 96 inches on 32 x 3½ Motz or 34 x 3½ tires at additional cost.

Price—$1,885.

Selling Points—Straight-line drive without universal joints; method of supporting motor and transmission elements, double-reduction drive, reduction gear built in the axle, light weight, high efficiency motor, liberal battery equipment, continuous torque controller, pedal control, twin expanding brakes, flexible and resilient springs, tiller type non-vibrating steering mechanism, Yale locks on doors, 20 coats of paint, ventilators, clear-vision windshield, dropped frame.

Equipment—Two front lamps, one tail lamp, complete toilet case, cut glass flower case, burglar proof locks on doors.

CHICAGO ELECTRIC.

Chicago Electric Motor Car Co., Chicago.

Models—Two models on the same electric chassis. Drive is through shaft with single reduction to bevel gear on rear axle. Tires are 36 x 4 cushion, and the battery equipment consists of 40 cells of Hycap Exide.

Prices—Four-passenger brougham, $2,800; five-passenger forward drive brougham, $3,100.

Selling Points—Five speeds up to 22 miles an hour, horizontal lever control, brake and propeller shaft connected with controller handle; reverse by wheel pedal without taking hand from controller handle, foot brakes operating 14 x 2½ expanding brakes on hubs, complete interlock system between foot brake reverse and controller, so that neither brake can be set without having power shut off; reverse cannot be applied without a braking operation.

Equipment—Full tool equipment and charging plug, Weston ammeter and voltmeter, eight-day Phinney-Walker keyless clock.

OHIO ELECTRIC.

Ohio Electric Car Co., Toledo, Ohio.

Models—Made in seven models; Models X, K, G and D are broughams and have wheelbases of 102, 90, 90, and 80 inches, respectively, on 34-inch wheels; Models T, Q and F are Victorias, all with wheelbases of 90 inches on 34-inch wheels. General Electric series wound motors are used in all models. Shaft drive obtains in all models.

Prices—Model X, $4,000; K, $2,900; G, $2,700; D, $2,600; T, $2,400; Q, $2,400; F, $2,300.

WAVERLEY ELECTRICS.

Waverley Co., Indianapolis, Ind.

Models—Eight models on the same electric chassis, mounting an 80-volt motor and equipped with 40 cells of 11-plate battery. Drive is by transverse shaft through double reduction spur and herringbone gears to the rear axle. Wheelbases are from 89 to 109 inches on 34 x 4 cushion or pneumatic tires.

Prices—Limousine five, $3,500; limousine four, $2,900; Georgian brougham, $3,250; Empire brougham, $2,800; Colonial brougham, $2,375; two-passenger coupe, $2,150; victoria-phaeton, $1,850; sheltered roadster, $2,250.

Changes from Previous Construction—Except for body refinements and the addition of one new model, the limousine four, there have been no mechanical alterations.

Selling Points—Wide range for choice; several models in which all seats face forward; low cost of maintenance; full-elliptic springs both front and rear; straight line shaft drive with driving shaft parallel to axle, eliminating necessity for transmitting power around a corner; double reduction gearing; high efficiency motor; knife-blade type controller; lever steer; good weight distribution; accessibility; simplicity.

Equipment—Lamps; charging plug; meters; flower vases; toilet articles.

WOODS ELECTRIC.

Woods Motor Vehicle Co., Chicago, Ill.

Models—Four models built on the same chassis. Transmission elements include shaft drive with reduction at the motor; controller is of the horizontal constant torque type, giving five forward and reverse speeds. Battery, 40 cells, 11-plate MV.

Prices—Extension brougham, $2,700; five-passenger extension brougham, $3,600; double victoria, $2,500.

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ADVANCES INDICATED BY THE TRUCK EXHIBITS

Development That Has Been Steady Though Unproductive of Startling Innovations—Worm Drive and Left Side Steering Gain Slightly and Governors a Growing Feature—Betterment of Light Trucks Pronounced.

Whatever an exhibition of commercial motor vehicles might have been about the time those machines were kicking themselves free of their shells, metaphorically speaking, and were metallic embodiments of the extremely unsettled states of mind of their respective creators, each of whom disagreed with each of the others on nearly all points save that the wheels undoubtedly ought to be round—whatever a motor truck show might have been in what people sometimes are pleased to refer to as the "good old days," it is beyond contradiction that the imminent annual functions, the National Shows, will be far, far from resembling transient museums of mechanical mistakes.

Differences Have Dwindled Into Details.

There was a time, as there must be in the youth of every industry, when people were trying to find out the right way to build burden-bearing automobiles, and, heaven knows, they tried practically all the wrong ways there were before hitting upon the correct ideas. And while it may be very well to ask, in all seriousness, if the right ideas really have been arrived at, it is not without significance that, notwithstanding strenuous and earnest efforts on the part of most manufacturers to be distinctly individual and yet turn out better machines than their competitors, practically all have accepted the same broad principles and differences are yearly becoming chiefly matters of detail. And yet—who knows what these same designers may think of their present work twenty-five years hence?

Similarity and "Class" That Prevails.

All of which moralizing, or philosophizing, or philandering, or whatever it may be termed, is the direct result of a prophetic view of the coming shows, so far as their commercial car aspects are concerned. Two things are certain, never was there in this country an assemblage of machines that so closely resembled each other, and never was there so much downright "class" to a truck show as to those in New York and Chicago. The fact, patent from a review of the specifications and features of the machines on exhibition, that there are no daringly new things shown, may well be considered an indication of progress of the most substantial and satisfactory sort; for, taken in conjunction with the fact that many makers are working methodically along the same general lines, it indicates a certain concord of opinion of trained minds and that "pulling together" spirit that is so infinitely more productive of results than the more flashy and spectacular individualities that have been intimately connected with that worn-out expression "revolutionize the industry" in the good old days already referred to.

Newcomers and Newness A-plenty.

There are several answers to the inevitable question, "What's new?" at the big shows. There will be the big 6-ton Smith-Milwaukee, the heaviest of the worm-driven contingent, which takes the place of last year's 5-tonner of the same design; the La France, with Manly hydraulic transmission of power; the Stewart and the Gramm-Bernstein—new machines built by men whose names are by no means new in the annals of motor truck manufacturing; the Nateo, a machine that has behind it both backing and brains; the Brown, which has every appearance of being what its makers say it is—a "real car"; and, among the electrics, the Atlantic, which is seen for the first time at the national shows, though it was exhibited at the Electrical Show last fall; the Urban, built by a firm of old-time carriage manufacturers; the M & P, in which the motor and its accessories are grouped under the driver's seat and drive to the jackshaft is by the propeller shaft. A striking machine is the new Baker tractor—short, thick-set and powerful looking. A big 5-ton truck with shaft drive has been added to the Waverley line. A small truck, with worm drive, makes the third member of the Diamond T family.

Influence of Parts Specialists Revealed.

Because of its low price, to say nothing of the engineering prestige of its builders, the new Gramm 1,500-pound wagon that makes its first appearance "on any stage" at the National show in New York, is the focus of no small amount of interest. Its four-cylinder motor, three-speed selective gearset and side chain drive are built for real work and are worthy, apparently, of bigger figures to the right of the dollar mark.

It is in no wise discreditable to manufacturers of commercial vehicles to point out that an enormous burden has been lifted from their collective shoulders by the many specialists who throw all their energies each into the production of some special line of parts, and thus are enabled to furnish makers of complete machines with parts that not only are far better than most factories can produce incidentally to the construction of cars as a whole, but also at less cost. That the specialist has the advantage in every way of the small "generalizer," so to speak, is now so widely recognized that, far from being ashamed of the fact that they do not themselves make some part or parts of their trucks, manufacturers are "pointing with pride" to the specialties incorporated in their machines, and right here is seen one of the vast advantages of the "pulling together" idea.

Assembled Machines as Excellent Examples.

Carrying this principle to its logical conclusion, there are trucks that are built wholly of purchased parts—assembled machines, as they are called—and if there is any fault to be found with the trucks produced by this system, it is a problem to discover what it may be. Of course, there are many makers who make more or less extended use of purchased parts without saying very much about it one way or the other; but, on the other hand, there are those who do not hesitate to come out boldly and logically in favor of assembling. The builders of the Standard gasolene truck, for instance, have no apologies to make for the use of parts built by specialists, and certainly the truck itself needs nothing of the sort.

Of the manufacturers who do not go outside their own factory walls for anything except such standard parts as tires, ignition apparatus, wheels, and so on, it is necessary only to say that they usually are established on such a huge scale that they are in reality multi-specialists. The departments are virtually separate factories under a common management, and operations are carried on in such a large way that there are not the limitations that would hamper concerns trying to do the same thing on a small scale.

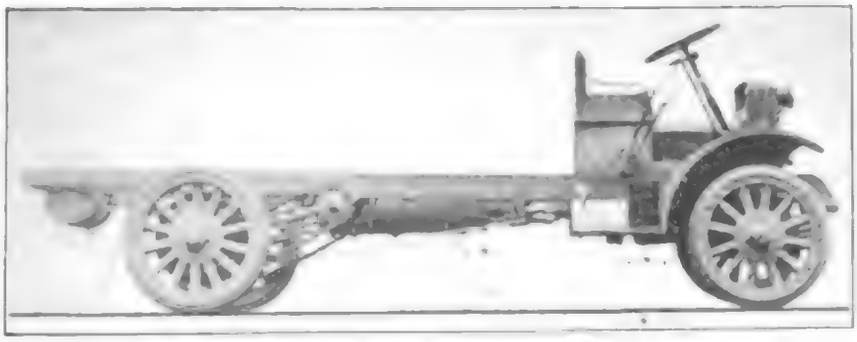
Number of Exhibits To Be Staged.

As far as appearances are concerned, there is ample opportunity to get a good idea of what the American motor truck industry amounts to by an inspection of the

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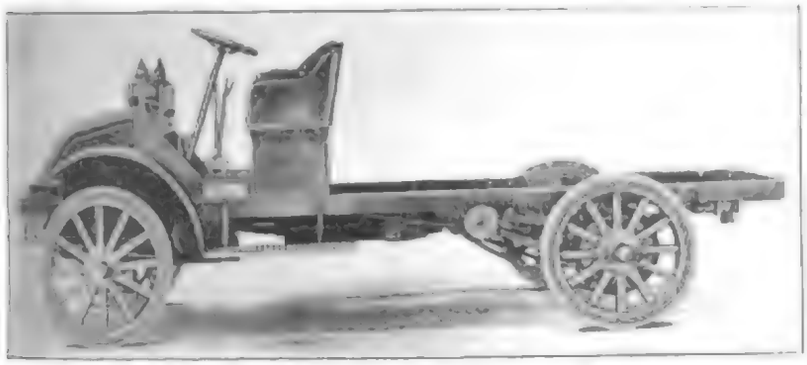
exhibits of 66 concerns in New York and 71 in Chicago, such being the sum totals of exhibitors, according to the latest returns, as the politicians express it. As was the case last year, Chicago has a little the best of it in the matter of numbers, due to the fact that the breezy burg attracts a considerable number of manufacturers from the Middle West who do not go as far afield as the Mecca of the Easterners. Of the total number of firms that help to bulge the walls of the Coliseum and the First Regiment Armory in Chicago and the good old Garden and the splendid Grand Central Palace in New York—there will be some 86 of them—48 will "double up," having exhibits in both cities, while New York will have 18 exhibitors who will forego the delights of Chicago, and Chicago will entertain—or be entertained by—20 who will eschew the January ocean breezes in New York.

To get down to brass tacks—with motor trucks in the role of brass tacks for the



NEW GRAMM-BERNSTEIN 3½-TON TRUCK CHASSIS

others; and in a few instances it has blossomed out—if such things can be said to blossom—into commercial existence. The old and the new worm-driven trucks taken together make up quite a little band, including the Pierce-Arrow, which is a veteran in worm transmission; the Smith-Milwaukee, the Rowe, the Universal, the Blair,



KELLY ONE-TON CHASSIS, SHOWING SLOPING HOOD

some—the most conspicuous tendency of the industry probably is the utter absence of anything like what used to be labeled with that term. There is nothing visible in the shape of a mad rush in any direction; no radical features have been "played up" to such an extent as to make a big, thick mark on the records; 1913 is not any particular kind of a "year"; there is nothing in sight that either threatens or promises to "revolutionize the industry."

"Worm Drivers'" Ranks Increased.

There are not lacking, however, indications that some of the promises of last year are being fulfilled, to some extent at least. Worm drive, which a year ago gave promise of considerable growth, has only partly fulfilled the promise. This silent, slippery transmitter of power has been tentatively and, let it be said, very cautiously taken up by a number of truck concerns, and experimental and test work has been carried on with a quietness that has amounted to secrecy in some instances. By some it has been abandoned; it still is in the probationary period on the test machines of the Schacht and the Diamond T. It is evident that, though the somewhat wild predictions that have been made as to the immediate future of the worm drive were rather wide of the mark, for the system has by no means taken the market by storm, genuine progress has been made—progress that is all the more satisfactory because it is not of the kind that is likely to take backward steps. The Smith-Milwaukee truck, with a carrying capacity of 6 tons, is the heaviest of all of the worm-driven machines.

Advances Made by Left Drive.

Somewhat more pronounced has been the accession to the ranks of users of left side steering, for almost a third of the exhibitors, taking all the shows together, have cars in which the driver's position will be on the "near" side. Some makers still are straddling the fence, so to speak, building cars with both right and left steer, while others have boldly gone over to the other side of the seat, including some who were in the hesitating class last year. It is a peculiarity of left side control that drivers who have become thoroughly accustomed to it do not seem to care to go back to steering on the right side. The electrics always were prominent in this matter of left control, but the gasolene cars, once having taken the hint, have taken it to some purpose, and this fact is very clearly brought out in the cars exhibited.

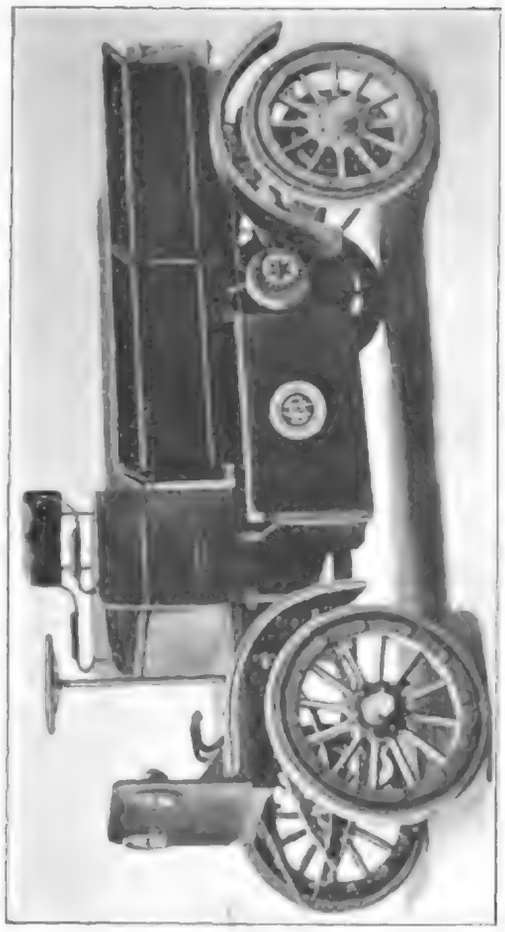
More General Use of Governors.

Another of last year's promises that is being carried out relates to the very important matter of governing the motors of gasolene trucks. The irresistible impulse of the average driver to "hit 'er up" whenever there is a good opportunity, as well as often when the time is anything but opportune, has led to so much trouble that the governor inevitably has come to the rescue.

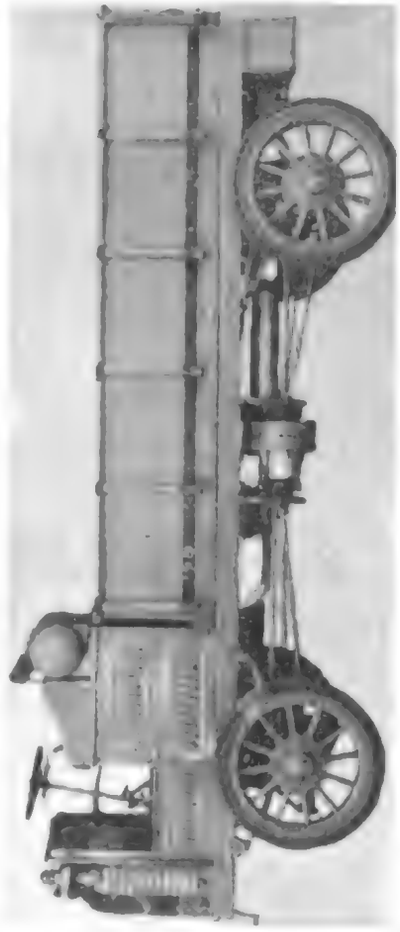


BROWN 1,500-POUND CHASSIS WHICH HAS INTERNAL GEAR DRIVE

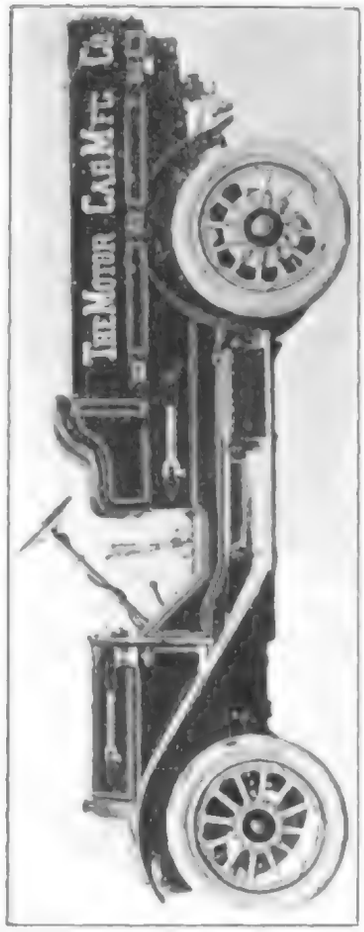
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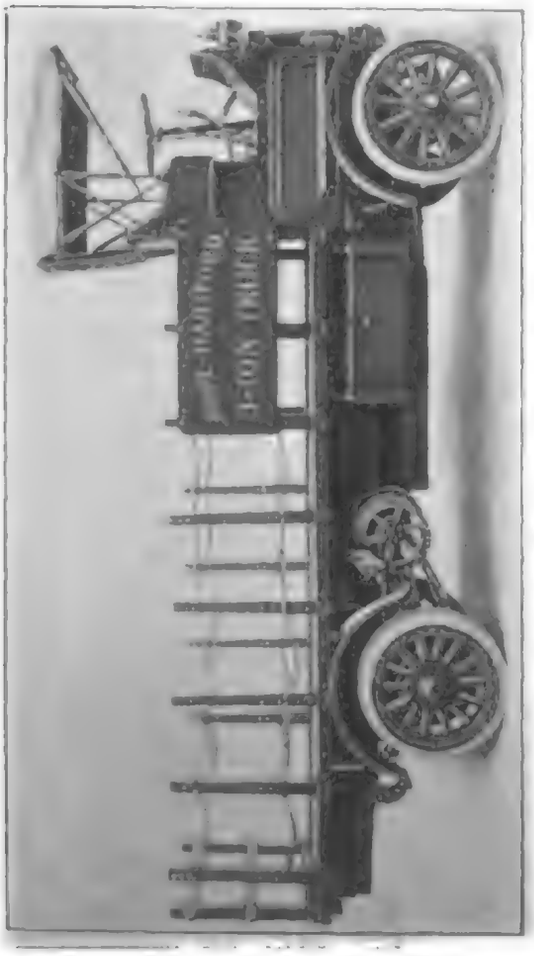
M & P 1,000-POUND ELECTRIC DELIVERY WAGON



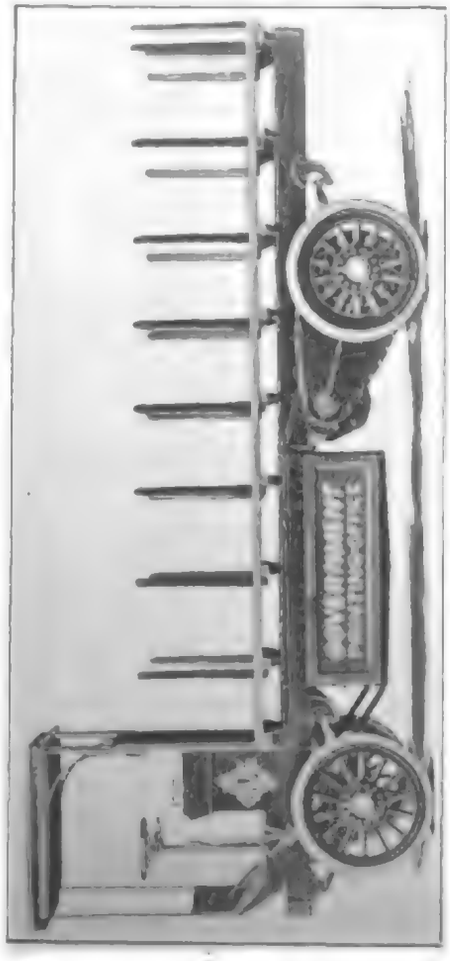
FOUR-WHEEL DRIVE 1½-TON TRUCK



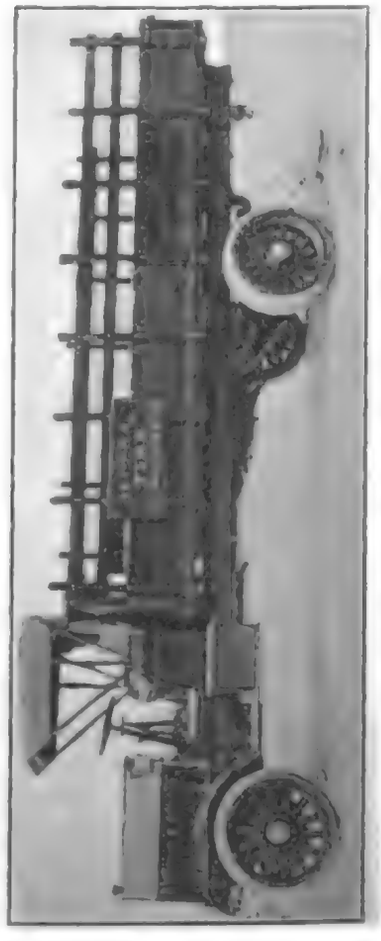
PATHFINDER 1,500-POUND EXPRESS BODY TRUCK



POPE-HARTFORD EQUIPPED WITH STAKE BODY

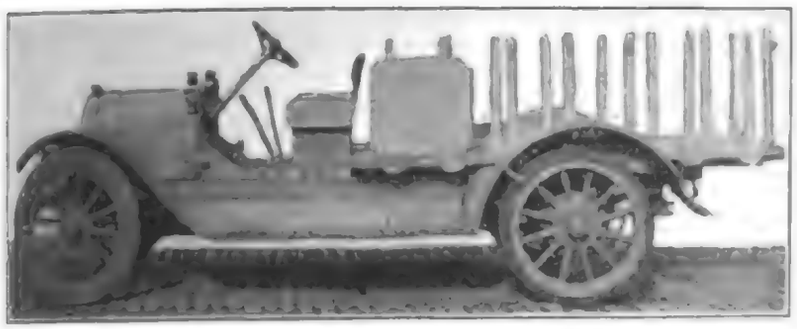


BAKER ELECTRIC HEAVY TRUCK TYPE VEHICLE



FOUR-TON KISSEL WITH EXTRA LONG BODY

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SCHACHT ONE-TON WORM-DRIVEN STAKE BODY TRUCK

It is now so well known as to be axiomatic that commercial vehicles cease to be economical and reliable when they are driven above certain critical speeds, for though a little time may be saved in getting over the road, much more is lost, in the long run, in repairing the damage caused by this speeding, and deterioration and wear and tear, to say nothing of the item of tire expense, tend to make matters very hard for the dealer whose guarantee is back of the machine as well as the owner who, with good reason, has been led to believe that the expense will be less than the amount he finds he has to pay out.

Air Cooling Remains Stationary.

So it is for the protection of both dealer and user that the maker has taken to putting the engine under automatic control. And further, owing to the diabolical ingenuity of some drivers in tinkering with governors that are susceptible of such delicate attentions, the tendency is to enclose all governor parts in casings that are tinker-proof—or, at least, they are designed to be tinker-proof. It may be that some drivers will manage to surmount the difficulties so placed in the way of indulgence in speed madness, but there can be no question that at the very worst the trouble will be much mitigated. However that may be, the fact remains that somewhere between 25 and 30 per cent. of the exhibits include trucks with governed engines.

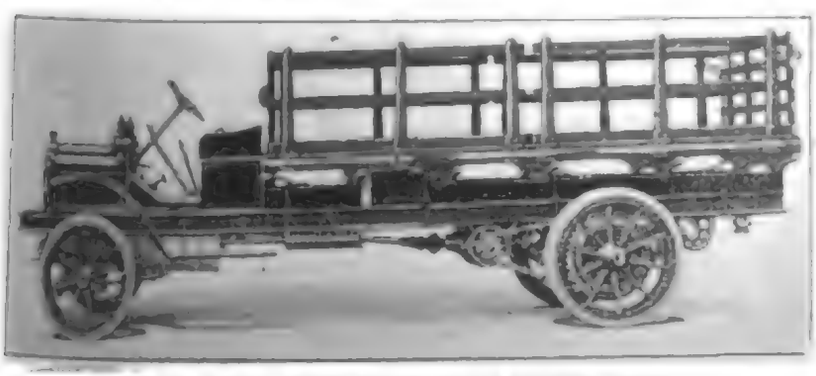
Air-cooled cars come and air-cooled cars go with the regularity of the ebb and flow of the tide. There is something peculiar about air-cooling; occasionally some maker hits upon the right combination of dimensions and areas and so on, and his motors run along with a reliability and efficiency that is tantalizing to the less fortunate ones who find in the use of the atmosphere as a heat-abstracting agent nothing but trouble. A few there be that like air, find it agrees with them and stick to it, in which connection the Chase car must not be forgotten; its success has been marked, whether it is on account of its air-cooling and its two-cycle principle or—as some unkindly ones have suggested—in spite of them. Air-cooling is employed also in the I. H. C., the Schacht and the Mercury machines. Missing from the ranks of air-coolers are the big Kelly and the little Sanford, which have taken the plunge, so to speak, and now are invested with ample and well-designed water jackets. The Mercury, which is water-cooled, and the Chase, which is air-cooled, will have the honor of representing the two-cycle principle of motor operation. The Four-Wheel drive car is alone in the class which is indicated by its name; but the performance of this machine in the army trials during the past year or so has marked it as a car to be reckoned with, and one qualified to uphold the honor of its kind.

The Lambert is prominent, as usual, as an example of power transmission without gears—that is to say, friction transmission—exploiting, as does the Commerce car, also, the type of transmission in which but two disks are employed.

One of the minor tendencies, but one that carries with it a very strong appeal to those who know something of the practical part of motor trucking in "mean" weather, is toward the fitting of cabs over driver's seats. Quite a number of makers are specifying these little shelters as part of standard construction; the cabs range all the way from mere roofs with side and front curtains for use in stormy weather to complete enclosures, in which any weather can be set at naught. The Lauth-Juergens is a familiar example of this sort of consideration for the driver.



AMERICAN LA FRANCE WHICH HAS MANLY HYDRAULIC DRIVE



THREE-TON WHITE WITH STANDARD PLATFORM BODY

Few Changes in Well-Known Trucks.

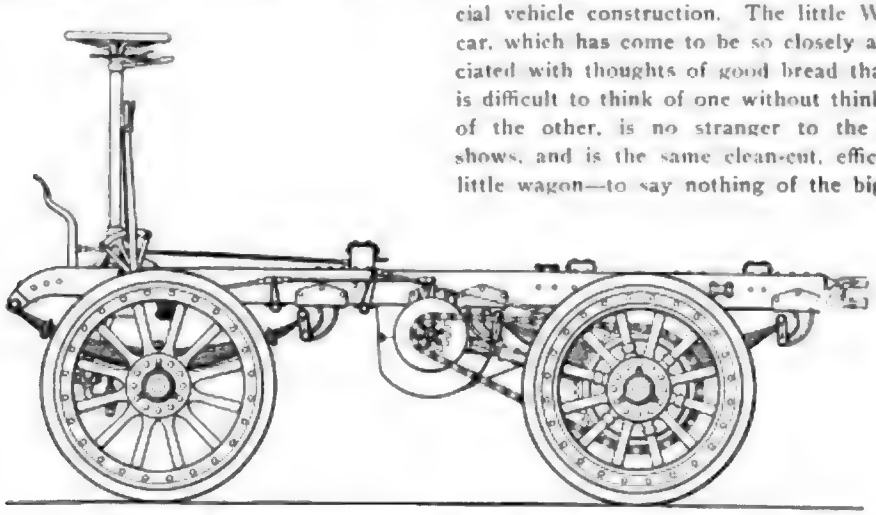
The "old timers" will be out in full force, as usual. Pierce, Packard, Peerless—the three P's are hard to separate—Sampson, and the three Internationals—Hewitt, Saurer and Mack—the big Knox family, Speedwell, and all the rest of them; but for the most part they are so little changed that a good deal more than a superficial examination is needed to detect what is altered, and in not a few instances there is absolutely nothing different. Alco, White, Garford, Buick, Velie, Reo—they are as they were; the big, capable looking Locomobile 5-tonner that made its initial appearance last year is just the same, and so it goes all along the line, with here and there an exception and here and there a new arrival,

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such as the sturdy Natco, the aristocratic Stewart, the business-like Gramm-Bernstein and the Brown. The Lippard-Stewart's accessibility is as striking as ever, and the shimmer of its gold-plated chassis is as effective a magnet for drawing crowds as it was at the Palace last year.

Unusual Construction Adds "Spice."

Though there is a grateful lack of the mechanically bizarre, it does not follow that there is nothing of interest outside of the lines laid down by orthodox engineering practice. The La France truck, in which is incorporated the Manly hydraulic drive; the Walker electric, in which the rear axle structure encloses an electric motor driving through gears enclosed in the pressed steel wheels, and the worm driven machines—all are sufficiently unusual to furnish a mild spicing to flavor the mass of exhibits, so to speak, though none of these systems is a stranger. The La France truck, as a whole, is a newcomer, however, and its wonderfully simple system of control and its positive transmission of power are features that mark it for more than ordinary interest and attention.



BAKER ELECTRIC TRACTOR—CAPACITY EIGHT TONS

Falling just short of an even dozen exhibits, the noble army of manufacturers of electrical commercial cars is strongly represented; and, be it said, the exhibits represent a degree of stability of design and standardization of construction that speaks eloquently of the years of development that have brought about these much to be desired results. Taking up the business man's burdens so early in the history of motor transportation that the success of the electric truck was temporarily set back by its very earliness, the lost ground has been more than regained, and the electric is in a sort of class by itself, when it comes to short distance work, either heavy or light—and, further, the "short distance" is yearly creeping up, mile by mile, as the combined efforts of makers of batteries, motors, tires and bearings bear fruit in the increase of power for weight, efficiency of operation, greater durability and easier driving and decreased friction.

Newcomers in this class include the M & P, which, though it has been on the market for the better part of a year, is being exhibited at a National show for the first time, and is a good example of the application of shaft drive to an electric vehicle. The Urban truck, shown for the first time by a concern that already has made a name for itself in the manufacture of horse-drawn vehicles—the Kentucky Wagon Mfg. Co.—is only nominally new, for it shows unmistakable appreciation on the part of its designers of what is best in electric commercial vehicle construction. The little Ward car, which has come to be so closely associated with thoughts of good bread that it is difficult to think of one without thinking of the other, is no stranger to the big shows, and is the same clean-cut, efficient little wagon—to say nothing of the bigger Wards, which are less conspicuous only because they are less numerous. The Atlantic, the Baker, the G. M. C., the General Vehicle, Lansden, Studebaker and Waverley are readily recognized by their individual characteristics, which they retain in every case, plus numerous examples of the detailed refinements that are so freely spoken of as "the only changes made since the last shows."

Engine Starters Make Slight Advances.

Despite the prognostications that have been made with regard to the use of motor starting devices for gasolene trucks, it does not appear that much has been done in this direction. The Schacht and the Gramm-Bernstein are putting out models in which electric starting and lighting systems are part of the regular equipment; but apart from some makers who fit starters as special equipment and some who doubtless are keeping starters "up their sleeves" for show surprises, these two form a somewhat lonely pair. This situation is rather difficult to account for, as some of the bigger motors are hard to start, and any motor that runs when it might just as well be standing still is using up gasolene, lubricating oil and wearing its parts unnecessarily. There is not much question as to the ability of a starting device to pay for itself before it is worn out, in some classes of service, at least, and why the lead of the pleasure car in the use of means for eliminating the use of the crank has not been more generally followed by truck builders is not apparent, though doubtless they have reasons that are considered good and sufficient.

Better Construction Is Apparent.

There probably never was a time when any doubt existed as to the necessity for using good material and careful workmanship in the construction of heavy trucks. The mere idea of carrying the loads that the big fellows have to get away with is enough to impress one with the indispensability of plenty of strength. When it came to light loads, however—loads that could be compared with the weights carried by small horse-drawn wagons—things seem to have been looked at in another light. Perhaps some of the people who built, say, 500-pound or 1,000-pound motor wagons, had in mind the sort of horse-drawn wagons that would carry similar loads; perhaps there were other reasons. However, it is a fact that at one time there were a great many machines turned out that seemed, to mechanical eyes, far from equal to their tasks; they were rough affairs, put together cheaply of cheap materials, with little or none of the painstaking care that always has been more or less a feature of the big machines and, for that matter, the little ones, too, of the better kinds.

Wherein Light Trucks Have Improved.

The present output of small machines is clearly indicative of a shift of viewpoint on the part of some of the builders, if not all, who still are doing business. The idea that any old combination of motor, gearset, axles and so on would do to carry a light load has been dispelled, and if the truth were known, doubtless it has been dispelled to the accompaniment of breaking frames, flopping tires, snapping chains, balking motors, springing axles and the thousand and one other evil things that a truck born of a mistaken idea can do. There is no doubt that the makers of motors, gears, frames, axles and other parts have had much to do with the improvement that is so noticeable in the small fry as a class, for by making really first-class components available at a time when many builders were learning by experience the shortcomings of inferior stuff, the manufacture of really fine little kagons was encouraged. The new crop of small wagons is in every way a sharp contrast to the crop of a few years ago. The machines have every appearance of being

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what a designer might call a "real engineering job" and not a jumble of patch-work. Take them just as they come, there is a great splitting of quality in the ranks of the little fellows that are designed to carry the light loads.

In commercial vehicles of all types there is a decided tendency to meet the purchaser in the matter of wheelbases and other details, such as battery equipment in the case of electrics. There is such obvious discouragement to the would-be purchaser who sees something that is almost, but not quite, what he wants, but is told that he must take what there is or do without, that a number of makers have adopted the plan of giving considerable latitude in different dimensions. To be sure, there are makers who have done this almost from the beginning; but the point is that the practice is gaining in favor, much to the benefit of the man who pays and who wishes to do his own choosing.

Considering the commercial vehicle shows as one, there is nothing to do but to make the orthodox assertion that it is better than anything of the kind that has gone before. And while it would be nothing short of treasonable to say anything else, and would call for an unsual amount of courage to express such an opinion if there was reason for it, the truth really is that the machines brought together indicate an existing state of affairs—that American motor trucks never were improving more rapidly and rationally.

THE TRUCKS AND WHAT THEY WILL HOLD FORTH

Individual Characteristics and Originalities That Serve to Distinguish Each Make—Prices, New Models, Improvements and Selling Points Made Plain.

ATTERBURY.

Atterbury Motor Car Co., Buffalo, N. Y.

Models—Four chassis models; capacity 1,500 pounds, 1, 2 and 3 tons. Chassis weights, 1 ton, 3,500 pounds; 2 ton, 4,700 pounds; 3 ton, 5,600 pounds. Wheelbase 1-ton, 128 inches; 2-ton, 144 inches; 3-ton, [illegible] inches. Motors of the L-head type, with cylinders cast in pairs; bore and stroke of 1-ton truck, 4 x 4½ inches; 2-ton truck, 4½ x 5½ inches; 3-ton truck, 4⅞ x 5½ inches. Automatic sealed governors, cone clutches, three-speed selectively controlled gearsets and side chain final drive in all models. Wheels on all models, 36 inches front and rear. Tires, 1-ton, 3½-inch front and 4-inch rear; 2-ton, 3½-inch single front and 5½-inch dual rear; 3-ton, 4-inch single front and 4-inch dual rear.

Prices—1,500-pound delivery wagon, $1,250; 1-ton truck, $1,750; 2-ton truck, $2,000; 3-ton truck, $3,600.

Selling Points—Specially designed strut or radius rod, swivelling on rear axle with double universal action between jackshaft and axle relieving machine of undue strain from this direction. Heavy cushion springs on front end of rod to take up starting jar and jerks. Double ignition with two sets of [illegible].

Equipment—Three oil lamps, jack and set of tools.

AUTOCAR.

The Autocar Co., Ardmore, Pa.

Models—One chassis model; capacity 3,000 pounds; wheelbase 97 inches; tread 56 inches. Motor, two horizontal opposed cylinders, bore 4¾ inches, stroke 4½ inches, horsepower 18 (A. L. A. M. rating). Multiple dry disk clutch, three-speed sliding gears and shaft drive. Front springs semi-elliptic, rear springs platform. Tires, optional, 34 x 3½ inches front and 34 x 4 inches rear, solids, or 36 x 5 pneumatics front and rear, with two extra inner tubes.

Prices—Chassis, $2,150; bodies from $275 to $750 extra.

Selling Points—Simple and reliable motor with ball-bearing crankshaft, full-floating rear axle and Autocar patented double gear reduction, roller bearing gearshafts, substantial construction throughout.

Equipment—Acetylene headlights and gas tank, three oil lamps, horn, full kit of tools, storm apron, front and side curtains.

ALCO.

American Locomotive Co., New York.

Models—Four chassis, of following capacities: 2 ton, 3½ ton, 5 ton and 6½ ton. Two-ton motor, 4½ x 5½ inches, rated at 32.4 horsepower, 112-inch standard wheelbase on solid tires, 36 x 4 inches single front, 36 x 3 inches dual rear; 3½-ton motor, 5 x 6 inches, rated at 40 horsepower; 126-inch standard wheelbase on solid tires, 36 x 5 inches single front, 36 x 4 inches dual rear; 5-ton motor, 5 x 6 inches, rated at 40 horsepower; 144-inch standard wheelbase, on solid tires, 36 x 5 inches single front, 42 x 5 inches dual rear; 6-ton motor, 5 x 6 inches, rated at 40 horsepower; 144-inch standard wheelbase, 164-inch special, on solid tires, 36 x 7 inches front, 42 x 6 inches rear. Dry plate clutch on all models, three-speed selective gearset. Side chain final drive.

Prices—Two-ton chassis in the lead, $2,950; 3½-ton, $3,650; 5-ton, $4,750; 6½-ton, $5,200.

Changes from Previous Construction—Refinements throughout. Chief change is new enclosed dry plate clutch, with the pressure reduced.

Selling Points—Unusual size and strength of parts; superior heat-treated materials, factor of safety of 5, one-piece front and rear axles, steel driver's cab and tool box, substitution of steel for wood wherever practical, honeycomb radiator, motor simple, powerful and dustproof, with valves inclosed; carburetter adjustment under seat, improved clutch, thorough and automatic oiling system, with sight feed on dash; transmission fool-proof; gusset plates reinforcing frame; positive, quick-acting brakes; improved spring hangers.

Equipment—Steel tool box, with tools and spare parts, side and tail oil lamps, bulb horn.

AVERY.

Avery Co., Peoria, Ill.

Models—Three chassis models; capacity 2, 3 and 5 tons. Two-ton and 3-ton built in two wheelbase lengths each, 128 inches and 140 inches; 5-ton, 128 inches only. Frames built in two types, one having flat steel bars and the other steel channels. Treads, 2- and 3-ton, 62 inches front and 68 inches rear; 5-ton, 62 inches front and 70 inches rear. Chassis weights, 2-ton, 5,500 pounds; 3-ton, 5,700 pounds; 5-ton, 7,200 pounds. Same motor in all models; four-cylinder, 45 horsepower, L-head cylinders individually cast, 4¼ x 5 inches bore and stroke. Multiple disk clutches, three-speed selectively controlled gearsets and side chain final drive in all models; 36-inch wheels front and rear on 2-ton model, with 4-inch single front and 3½-inch dual tires rear; 38-inch wheels front and rear on both the other models; tires on 3-ton, 5-inch single front and 4-inch dual rear; on 5-ton, 6-inch single front and 5-inch dual rear. Gasolene capacity of two smaller models, 23 gallons; of larger model, 30 gallons.

Prices—Chassis, 2-ton, $2,700; 3-ton, $3,200; 5-ton, $4,500.

Changes from Previous Construction—New throttle control governor, improved clutch of greater durability; improvements in many details.

Selling Points—Individually cast cylinders, five-bearing crankshaft, simple and effective lubricating system, governed motor, clean-out plugs on tops of cylinders for removing carbon easily, compact and substantial gearset; 5-ton has forward-tipping

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seat, a construction which gives access to motor.

Equipment—Three oil lamps, jack and set of tools.

BESSEMER.

Bessemer Motor Truck Co., Grove City, Pa.

Models—Three chassis models; capacity, 1,000, 2,000 and 3,000 pounds, respectively; wheelbases, 102, 120 and 136 inches. Motor in 1,000-pound model, 25 horsepower, block-cast cylinders, 3¾ x 4½ inches bore and stroke, enclosed valves. Motor in both other models has cylinders of 3¾ bore and 5¼ stroke, block-cast. All three models have cone clutches, three-speed selectively controlled gearsets built in units with jackshafts, and side chain final drive. Wheels in all models, 34 inches in diameter front and rear; tires on 1,000-pound, 2-inch front and 2½-inch rear, solid; on 2,000-pound, 3-inch front and 3½-inch rear; on 2,000-pound, 3½-inch front and 4-inch rear.

Prices—Chassis, 1,000-pound, $1,200; 2,000-pound, $1,800. 3,000-pound, $2,700.

Selling Points—Stability of construction and accessibility of all working parts; uniform design throughout the line; standard power and transmission units; spring mounted radiator of honeycomb type.

Equipment—Three oil lamps, horn and set of tools.

BROWN.

Brown Commercial Car Co., Peru, Ind.

Models—One chassis model; capacity, 1,500 pounds. Wheelbase, 122 inches; tread, 56 inches. Motor, L-head, with four block-cast cylinders, 3¾ x 5¼ inches bore and stroke, 25 horsepower. Dry disk clutch, three-speed selectively controlled gearset and final drive by propeller shaft to rear axle and through pinions on axle shafts to internal gears on driving wheels. Tires, 34 x 3½ front and 34 x 4 rear, cushion; pneumatic optional.

Price—Chassis, $1,650.

Selling Points—Internal gear final drive, with jackshaft carried on dead rear axle; triangular torque-rod arrangement, with ball joint at the apex; tubular propeller shaft unit power plant; left steer; radiator mounted on coil springs.

COMMERCE.

Commerce Motor Car Co., Detroit, Mich.

Models—One chassis model, capacity 1,000 pounds. Chassis weight, 1,600 pounds. Wheelbase, 96 inches. Motor, four-cylinder, 20 horsepower, cylinders cast in pairs; three-bearing crankshaft. Friction transmission with one driving and one driven disk; single chain drive from disk shaft to rear axle. Wheels, 32 inches, with 3½-inch pneumatics; option is given of 34 x 2½-inch solids.

Prices—Chassis price, $700.

Changes from Previous Construction—None.

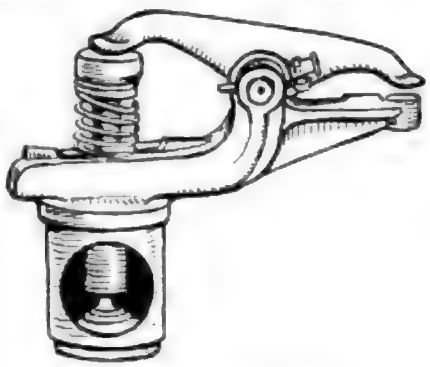
Selling Points—Friction transmission giving any speed desired, no gears and no clutch, simplicity of construction throughout, ample power, high-tension magneto, set spark.

Equipment—Three oil lamps, horn, tools, pump and tire repair outfit.

BUICK.

Buick Motor Co., Flint, Mich.

Models—Two chassis models, one of 1,500 pounds capacity and the other a light parcel wagon. Wheelbase of 1,500 pound model, 92 inches or 110 inches; tread, 56 inches. Chassis weight, 2,200 pounds. Motor, horizontal, two opposed cylinders, placed under body. Cylinders 4½ x 5 inches bore and stroke; 22 horsepower; cone clutch, two-speed planetary gear and side chain final drive. Wheels 32 inches front and rear, with 4-inch tires, either solid or pneumatic. Gasolene capacity, 10 gallons.



BUICK VALVE CAGE

Prices—Short wheelbase, $965; long wheelbase, $980.

Changes from Previous Construction—None in 1,500 pound car. Parcel wagon new throughout.

Selling Points—Simple and compact motor of well tried design and of high power for its size; rugged and substantial construction of the whole machine; planetary transmission well proportioned and accurately built.

Equipment—Three oil lamps, horn, jack, pump, tools, and tire repair outfit.

DART.

Dart Mfg. Co., Waterloo, Iowa.

Models—Three models, of 750 to 1,000 pounds, 1,000 to 1,500 pounds, 2,000 to 3,000 pounds. Wheelbase, 85, 114 and 130 inches, respectively. The motor for the 750 to 1,000 pounds capacity is double opposed, four-cycle type, 4¼ x 5 inches. The motors for the 1,000 and 2,000-pound trucks are both four-cylinder, 4 1/16 x 4½ inches and 4¼ x 5½ inches, respectively. The smallest model truck is 18 horsepower, the 1,000 to 1,500-pound is 30 horsepower, and the 2,000 to 3,000-pound is 40 horsepower. Chain drive entirely on the small model, shaft to jackshaft chains to rear wheels on the two larger models. Solid steel axles on all three trucks; solid tires are equipment on all models.

Prices—750 to 1,000-pound with open express body, $750; 1,000 to 1,500-pound, with open express body, $990; 2,000 to 3,000-pound, with seat only, body to be built according to order, extra $1,790.

Selling Points—Left-hand drive, center control, transmission and jackshaft in unit; extra heavy construction throughout, all parts tested with the greatest care, both in the rough and in the assembled states.

DAYTON.

Dayton Auto Truck Co., Dayton, O.

Models—Three chassis models; capacity, 2, 3 and 5 tons. Wheelbase of 2-ton, 120 inches; of 3-ton, 136 inches, and of 5-ton, 150 inches. Weight of 2-ton chassis, 4,825 pounds; of 3-ton, 6,575 pounds; of 5-ton, 8,650 pounds. Motors in all models have pair-cast cylinders; 2-ton has 35 horsepower, 4¼ x 5 inches bore and stroke; 3-ton has 45 horsepower, 4¾ x 5½ bore and stroke; and 5-ton has 60 horsepower, 5¼ x 7 bore and stroke. Multiple disk clutch, three-speed selectively controlled gearsets and side chain drive, all models. Gasoline capacity, 17 gallons on 5-ton, 10 gallons on both the smaller models.

Prices—Chassis, 2-ton, $2,650; 3-ton, $3,400; 5-ton, $4,500.

Changes from Previous Construction—Round gasolene tanks on all chassis; S. A. E. bands on demountable rims.

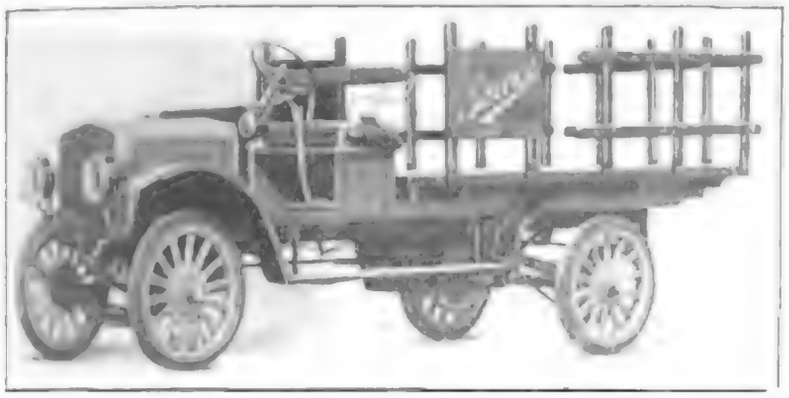
Equipment—Three oil lamps, horn and set of tools.

CHASE.

Chase Motor Truck Co., Syracuse, N. Y.

Models—Five chassis models; capacity, 500 pounds, 1,000 pounds, 1, 1½ and 2 tons. Chassis weights, 500-pound, 1,500 pounds; 1,000-pound, 2,300 pounds; 1-ton, 2,700 pounds; 1½-ton, 3,600 pounds; 2-ton, 4,400 pounds. Wheelbases and treads, 500-pound, 84 inches and 58 inches; 1,000-pound, 100 inches and 58 inches; 1-ton, 106 inches and 58 inches; 1½-ton, 112 inches and 62 inches; 2-ton, 120 inches and 62 inches. Motors in all models, two-cycle, air-cooled, individually cast cylinders. Two-cylinder, 12-horsepower motor, with 4⅛-inch bore and 4-inch stroke, in 500-pound model; three-cylinder 20-horsepower motor in 1,000-pound model, 4⅛-inch bore and 4-inch stroke; motor in 1-ton same as in 1,000-pound model; 1½-ton and 2-ton models have three-cylinder 30-horsepower motor, 4½-inch bore and 5-inch stroke. Planetary transmission in the three smaller models and three-speed selective sliding gears in the two larger; final drive by side chains in all models. Wheels in smallest car, 34 inches front and 36 inches rear; in all others, 36 inches front and 38 inches rear. Tires on two smallest cars, 2 inches all round; on 1-ton, 2½ inches front and 3 inches rear; on 1½-ton, 3 inches front and 3½ inches rear; 2-ton, 3½ inches front and 4 inches rear.

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MODEL M SERVICE STAKE BODY TRUCK LISTING AT $1,750

Prices—Will open express bodies, 500-; ... wagon, $500; 1,000-pound car, $900; ... $1,250; 1½-ton, $1,750; 2-ton, $2,200.

Changes from Previous Construction—...

Selling Points—Simple construction, air-... or without valves or water-cool-... system, no lubricating mechanism, ... mixed with gasolene.

Equipment—Three oil lamps, horn, and ...

FEDERAL.

Federal Motor Truck Co., Detroit, Mich.

Models—One chassis model made in two ... or lengths, 110 inches and 144 inch-... capacity 1 ton. Tread, 56 inches. Mo-... 4-cylinder L-head type, with cylinders cast ... 4½ x 4½ inches bore and stroke, ... Throttle control by accel-... Leather-faced cone clutch with ... ring, three-speed selectively con-... gearset and final drive by side ... Wheels 36 inches in diameter front ... rear, tires 3½-inch front and 4-inch ... Gasolene capacity, 21 gallons.

Prices—Chassis, either wheelbase, $1,800.

Changes from Previous Construction—...

Selling Points—Left-hand drive, high-... ignition with set spark and foot ... of throttle, handling extremely easy to master, enabling green men to be broken in quickly; unit system of construction, with each unit removable without disturbing others.

Equipment—Three oil lamps, horn, oil can, jack, and set of tools.

CLARK.

Clark Delivery Car Co., Chicago, Ill.

Models—One chassis model; capacity, 1 ton. Wheelbase, 100 or 120 inches; tread, 56 inches. Motor, 25 horsepower, four block-cast cylinders, 3¾ x 5 inches bore and stroke. Dry plate multiple disk clutch, three-speed selectively controlled gearset of the individual dog clutch type with gears always in mesh; final drive by shaft and bevel gears. Tires, 36 x 3 front and 36 x 3½ rear.

Price—Chassis, $2,000.

Selling Points—Gears always in mesh and all idle on high speed; option of 120-inch wheelbase, with motor under hood in front or under floor; well braced frame; heavy rear axle and torque rod; sufficient power and strength to haul a trailer.

KELLY.

Kelly-Springfield Motor Truck Co., Springfield, O.

Models—Two chassis models, 1 ton and 3 ton capacity; the 1-ton is made in two wheelbase lengths, 120 inches and 144 inches; wheelbase of 3 ton truck, 144 inches. Motor of 1-ton truck has 4 cylinders, block-cast, of the L-head type; bore and stroke, 3½ x 5¼, 30 horsepower. Cone clutch, three-speed selectively controlled gearset and side chain final drive. Tires are 36 x 3½ front and 36 x 4 rear. Tread, 56 inches front and 60 inches rear. The 3-ton truck has a four-cylinder motor of the T-head type with pair-cast cylinders, 4½ x 6½ inches bore and stroke, 38 horsepower. Transmission system the same as the 1-ton truck. Tires, 38 x 5 single front and 42 x 5 dual rear.

Prices—One-ton chassis, $2,000.

Changes from Previous Construction—Both models new throughout. All motors water-cooled instead of air-cooled.

Equipment—Lamps, horn, jack, and set of tools.

GARFORD.

The Willys-Overland Co., Garford Dept., Toledo, O.

Models—Three chassis models; capacity, 1½, 3 and 5 tons, respectively. Wheelbases, of 1½-ton, 145 inches; of 3- and 5-ton models, 128 inches. Tread of 1½-ton, 56 inches; of 3-ton, 61¼ inches front and 63 inches rear; of 5-ton, 61¼ inches front and 71½ rear. Weights, 1½ ton, with body, 4,322 pounds; of 3-ton chassis, 6,800 pounds; of 5-ton chassis, 7,650 pounds. Motor of 1½-ton truck, four-cylinder, T-head, with cylinders cast in pairs; bore and stroke, 3¼ x 5¼ inches, 30 horsepower. The same motor is used in the 3- and 5-ton trucks; four-cylinder L-head type motors with block-cast cylinders; bore and stroke, 4¼ x 5¼ inches, 28.9 horsepower. All models have cone clutches and selective sliding gears; four speeds in 5-ton truck and three in the smaller models. Shaft drive in 1½-ton and side chain drive in the 3- and 5-ton trucks. Wheels of 1½-ton truck 36 inches in diameter, front and rear; pneumatic tires, 4½-inch single front and 4½-inch dual rear. Wheels of 3-ton truck, 36 inches front and 40 inches rear; tires, solid, 5 inches single front and 4 inches dual rear. Wheels of 5-ton truck, 36 inches front and 40 inches rear. Tires, 6-inch single front and 6-inch dual rear. Gasolene capacity, 23 gallons, all models.

Selling Points—In light truck, pneumatic tires and powerful motor, permitting safe speed of 30 miles an hour; motor in front under hood. In heavier types, motors under driver's seat and footboard, permitting short over-all length in proportion to loading space. Four-speed gearset in 5-ton truck. Large rear wheels, 40 inches, on two larger trucks.

LAMBERT.

Buckeye Mfg. Co., Anderson, Ind.

Models—Three chassis models: 1,500-pound delivery wagon, 1-ton truck and 2-ton truck. Chassis weights, 2,650, 3,500 and



BLAIR WORM-DRIVEN TRUCK WITH OPEN TYPE BODY

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4,250 pounds, respectively. Wheelbases of two smaller cars, 114 inches and of larger car 120 inches. Additional wheelbase length to order at an additional cost of $25 per foot. Tread 56 inches in all cases. All motors of the same type with L-head cylinders cast en bloc and enclosed valve stems. Motor of smaller car, 20-24 horsepower, bore and stroke 3½ x 4¼ inches; of the two larger cars, 35 horsepower, cylinders 4⅛ x 4½ bore and stroke. Lambert friction drive with two disks and final drive by side chains. Front axle on small car, tubular; on larger cars, I-beam. All rear axles solid steel. Tires on small car, pneumatic, 33 x 4 front and rear. Tires on 1-ton truck, solid, 36 x 3 front and 36 x 3½ rear. Tires on 2-ton truck, solid, 36 x 3½ front and 36 x 4 rear. Gasolene tanks under driver's seat. Capacity in small car, 10 gallons; in larger cars, 12 gallons each.

Prices—Delivery car chassis, $1,125; with stake or express body, $1,200; with enclosed body, $1,375; One-ton truck chassis, $1,700; with stake of express body, $1,800. Two-ton chassis, $2,100; with stake or express body, $2,200.

Selling Points—Friction transmission, giving very wide range of speeds without gears; no clutch; jarless starting and smooth, quiet running. Compact ball-bearing motors. Springs shackled at both ends, giving free action. Driving stresses taken by radius rods. Stiff frame, unusually well braced. Foot brake automatically releases friction disks; engagement of disks automatically releases brake.

Equipment—Lamps, horn and tools.

FLINT.

Durant-Dort Carriage Co., Flint, Mich.

Models—Two chassis models, capacity 1,000 and 1,600 pounds. Wheelbases, 76 inches and 100 inches, respectively. The 1,000 pound model has motor with two horizontal opposed cylinders mounted under floor; the 1,600 pound model has a four-cylinder mounted on a sub-frame in front under a hood. Transmission in the smaller model is by friction gear with final drive by side chains and in the other by three-speed sliding gearset and shaft and bevel gears to live rear axle.

Prices—Of 1,000 pound model, with full panel body, $875.

Selling Points—Simplicity in construction and in operation, and economy. In friction driven model, no gears and no clutch and no differential.

Equipment—Three combination oil and electric lamps, horn, jack and tools.

STEWART.

Stewart Motor Corporation, Buffalo, N. Y.

Models—One chassis model; capacity 1,500 pounds. Wheelbase, 126 inches. Motor, four-cylinder, under hood in front, block-cast cylinders, L-head type, 3¼ x 5¼ inches bore and stroke, 30 horsepower. Dry disk clutch with 11 plates, three-speed selectively controlled gearset and final drive by propeller shaft and bevel gears. Wheels 34 inches in diameter front and rear; tires 4-inch front and 4½-inch rear, pneumatic.

Price—Chassis, $1,050.

Selling Points—Extreme accessibility and simplicity; cleanly designed block-cast motor; blades on flywheel make separate fan and its drive unnecessary; radiator behind the motor, where it is protected.

BLAIR.

Blair Mfg. Co., Newark, Ohio.

Models—Three chassis models of 1½, 2½ and 3½ tons capacity, wheelbases of 114 and 121 inches on 1½-ton, 121 to 144 on 2½-ton, and 130 to 144 on 3½-ton models. Chassis weights, 4,200 pounds on 1½-ton, 5,000 on 2½-ton and 6,150 on the 3½-ton model. All motors L-head type, four-cylinder, 35-horsepower on 1½-ton and 40 horsepower on other models. Bore and stroke of 1½-ton motor, 4⅛ x 5¼, and on the others 4½ x 5½. All models worm



BLAIR WORM-DRIVE AXLE

driven by direct shaft. Drop-forged front axle and full-floating type worm drive rear axle on all models. Solid tires single in front and dual in rear.

Prices—1½-ton chassis, $3,000; 2½-ton, $3,250; of 3½-ton, $3,750.

Selling Points—Accessibility, demountable unit construction, silent worm drive, three-point suspension of sub-frame carrying entire power plant and insuring absolute alignment under all conditions; short wheelbase, with full length loading space, without sacrificing accessibility due to arrangement of seats; pressed steel heat-treated frames, absolute interchangeability of all parts.

Equipment—Two oil dash lamps, oil tail lamp, horn and set of tools.

IDEAL.

Ideal Auto Co., Ft. Wayne, Ind.

Models—Five chassis models, one of 1,500 pounds capacity, two of 1 ton capacity, one of 1½ tons and one of 2 tons. Wheelbases and treads: On 1,500-pound, 100 and 56 inches; on 1-ton, Model H, 115 and 58 inches; on 1-ton, Model H-2, 124 and 58 inches, and the same on the 3½-ton truck. Chassis weights: 1,500-pound car, 2,700 pounds; 1-ton, Model H, 3,000 pounds; 1-ton, Model H-2, 3,500 pounds; 1½-ton, 4,000 pounds. Motor in 1,500-pound, four cylinders, pair-cast, 3½ x 4½ inches bore and stroke, 25 horsepower; in 1-ton, model H, the same motor; in 1-ton, model H-2, block-cast motor, with 3¾ x 5½ inches bore and stroke, 30 horsepower, or, at extra cost, 4⅛ x 5¼ motor of 42 horsepower; in 1½- and 2-ton, same motor as special for 1-ton. Three-speed gearsets and side chain final drive in all models. Tires on 1,500-pound, 36 x 3 front and 36 x 3½ rear; on both 1-ton models, 36 x 3½ front and 36 x 4 rear; on 1½-ton, 36 x 4 front and 36 x 5 rear; and on 2-ton, 36 x 5 single front and 36 x 3½ dual rear.

Prices—Chassis, 1,500-pound, $1,500; 1-ton, model H, $1,750; 1-ton, model H-2, $2,000; 1½-ton, $2,250.

Selling Points—Accessibility, correct distribution of weight, short wheelbase in comparison to loading space, special radiator suspension, automatic differential lock.

Equipment—Three oil lamps, horn, jack, and set of tools.

HUPMOBILE.

Hupp Motor Car Co., Detroit, Mich.

Models—One chassis model, capacity 800 pounds; wheelbase 100 inches; four-cylinder motor, L-head type, bore and stroke 3⅛ x 5½ inches, 32 horsepower; multiple disk clutch, three-speed selectively controlled gearset and shaft drive. Front tires 32 x 3½ and rear tires 33 x 4, pneumatic.

Prices—With delivery body, $950.

Changes from Previous Construction—Minor improvements in body lines, black and nickel trimmings and Hupmobile Royal black painting.

Selling Points—Unit power plant, long-stroke motor with block-cast cylinders and all working parts enclosed, pressure feed lubrication, high-tension magneto, full-floating rear axle, shock absorbers in rear, Q. D. rims, complete equipment, low-hung body which, however, has 9½ inches road clearance; center control with both doors available for use.

Equipment—Two-piece windshield, acetylene tank, gas headlights, oil side and tail lights, tools and horn.

LOCOMOBILE.

Locomobile Co. of America, Bridgeport, Conn.

Models—One chassis model, capacity 5 tons; wheelbase, 140 inches; tread, 65 inches front, 70 inches rear; motor, four-cylinder, cylinders cast in pairs, T-head type, 5 x 6 inches bore and stroke; 45 horsepower. Multiple dry disk clutch, four-speed selectively controlled gearset and side chain final drive. Wheels cast steel or wood, optional. Tires, 40 x 6 inches single in front, 40 x 6 dual in rear.

Prices—Chassis, $4,800.

Changes from Previous Construction—Minor details only.

Selling Points—Extremely substantial construction throughout and powerful, heavy, long-stroke motor; four-speed gearset, chains enclosed in cases that permit lengthening of distance between sprocket centers, differential lock for use on slippery

road surfaces, driving stresses taken by cast steel channel section radius members, frame of chrome nickel steel throughout, automatically governed motor, motor bearings accessible from beneath by removing pan, crankcase and gearcase of bronze, gears accessible without disturbing load on truck.

Equipment—Two side lamps, one tail lamp, horn, hub odometer and tool kit complete, including tool bag and spare parts.

PACKARD.

Packard Motor Car Co., Detroit, Mich.

Models—Three chassis models of 2, 3 and 5 tons capacity; wheelbases, 2-ton, 10 feet standard chassis, 12 feet long chassis; 3-ton, 12 feet short chassis, 12 feet standard chassis, 14 feet long chassis, 16 feet extra long chassis; 5-ton, one chassis, 14 feet. All motors are of the T-head type, four cylinders, 2-ton, 26 horsepower, bore 4 1/16 inches, stroke, 5¼ inches; 3-ton, 32 horsepower, bore 4½ inches, stroke 5½ inches; 5-ton, 40 horsepower, bore 5 inches, stroke 5½ inches. Drop-forged steel front and rear axles on all models. Drive on all models through jackshaft and sprockets through side chains to rear wheels. Solid tires on all models, rear tires dual. Gasolene capacity, 2-ton, 18 gallons; 3-ton, 21 gallons; 5-ton, 30 gallons.

Prices—Two-ton, $2,800; 3-ton, $3,400; 5-ton, $4,900, for chassis only.

Selling Points—Highly developed motor with control of governor; high-grade materials throughout the truck; choice of wheelbases; Packard service.

Equipment—Two oil dash lamps, oil tail lamp, horn, jack and complete set of tools.

PEERLESS.

Peerless Motor Car Co., Cleveland, O.

Models—Three chassis models; capacity 2, 3½ and 5 tons. Chassis weights, 3-ton, 6,-[illegible]; 4-ton, 6,855 pounds; 5-ton, 7,-[illegible]. Wheelbases are alike in all models, 161 or 174 inches. Treads, 3-ton, 60½ inches front and 60½ inches rear; 4-ton, [illegible] inches front and 71½ inches rear; 5-ton, [illegible] inches front and 73½ inches rear. The [illegible] used in all models; A. L. A. M. rating, 32.4 horsepower; 4½ x 6½ inches bore and stroke; cylinders cast in pairs, T-head type. Cone clutches, four-speed selective controlled gearsets and [illegible]-inch final drive, all models. Wheels on 3- and 4-ton trucks, 36 inches front and [illegible] rear; on 5-ton model, 38 inches front and 42 inches rear. Tires, 3-ton, 4 [illegible]-inch single front and 4-inch dual rear; 4-ton, [illegible]-inch single front and 5-inch dual rear; 5-ton, [illegible]-inch single front and 6-inch dual rear. Gasolene capacity, all models, 25 gallons.

Prices—Chassis prices, 3-ton, $3,700; 4-ton, $4,000; 5-ton, $4,500.

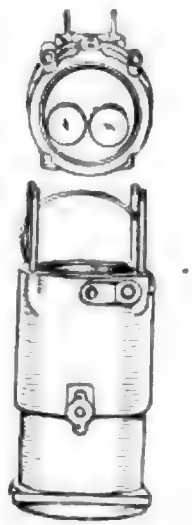
Selling Points—Four-speed gearsets, with direct gear giving great power for emergency work; long-stroke governed motor; [illegible] hard, yet tough, steel in sprockets; 80 per cent of load on rear wheels, ensuring traction; interchangeable bushings in all wearing points.

Changes from Previous Construction—None.

KNOX.

Knox Automobile Co., Springfield, Mass.

Models—Seven chassis models, three of 2 tons capacity and one each of 3, 4, 5 and 6 tons capacity. Two-ton models differ chiefly in wheelbases and treads; with 145-inch wheelbase, the tread is 60 inches front and 64 inches rear; with 103-inch wheelbase the tread is 69 inches front and rear, and with 127-inch wheelbase the tread is 59 inches front and 63 inches rear. All other models have 149-inch wheelbase. Treads in



KNOX CYLINDER

the 3-ton and 4-ton are 67 inches front and 68½ inches rear; 5-ton, 67 front and 73 rear; and in the 6-ton, 70½ front and 73½ rear. Tires on the 2-ton, 145-inch wheelbase, 34 x 4 single front and 34 x 4 dual rear; 2-ton, 103-inch wheelbase, 34 x 5 single front and 34 x 4 dual rear; 127-inch wheelbase, 36 x 5 single front and 36 x 4 dual rear. Tires on 3-ton, 36 x 5 single front and 36 x 5 dual rear; 4-ton, 36 x 4 single front and 36 x 6 dual rear; 5-ton, 36 x 6 single front and 40 x 6 dual rear; 6-ton, 36 x 7 single front and 42 x 7 dual rear. Two-ton chassis weights: 145-inch wheelbase, 4,800 pounds; 103-inch wheelbase, 4,600 pounds; 127-inch wheelbase, 5,400 pounds; 3-ton, 6,500 pounds; 4-ton, 7,000 pounds; 5-ton, 8,000 pounds; 6-ton, 8,800 pounds. Motors in 2-, 3-, 4- and 5-ton trucks, 45 horsepower; in 6-ton, 50 horsepower. All motors have individually cast cylinders with valves in heads; heads are removable. The 45-horsepower motor has bore and stroke of 5 x 5½ inches; 50-horsepower motor has bore and stroke of 5½ x 5½ inches. Unit power plants in all models; three-speed gearsets, selectively controlled; three-plate dry disk clutches; final drive by side chains.

Prices — Two-ton, 145-inch wheelbase, $3,000; 103-inch wheelbase, $3,200; 127-inch wheelbase, $3,500; 3-ton chassis, $3,-700; 4-ton, $4,000; 5-ton, $4,500; 6-ton, $5,-000. Knox Martin tractor, with 40-horsepower motor, $2,750; with 50-horsepower motor, $3,250.

Changes from Previous Construction—Spiral gears in place of spur gears on main driving set of gearset; long stroke motors in 2-, 3-, 4- and 5-ton models, all metal universal joints instead of leather-covered; three-bladed instead of two-bladed fans; heavier jackshafts, larger rear tires on 3-, 4- and 5-ton models.

Selling Points—Motors with individually cast cylinders and removable heads, giving easy access for cleaning carbon, valves in head, giving maximum power; heavy gearsets, spring mounted radiators. In the tractor, adaptability to all kinds of bodies, short turning radius and easy control; compact construction.

SPEEDWELL.

Speedwell Motor Car Co., Dayton, O.

Models—Three chassis models, of 2 tons, 4 tons and 6 tons capacity, respectively; wheelbase, 115 inches, 115 inches with option of 139 inches, and 139 inches, respectively; chassis weights, 4,900 pounds, 6,600 pounds and 7,200 pounds, respectively; all motors of L-head type, four-cylinder, water cooled; 2-ton truck motor cylinders are block-cast with enclosed valves; bore, 4⅛ inches; stroke, 5¼ inches; 35 horsepower, with governor; 4- and 6-ton motor cylinders cast in pairs, 5 x 5, 40 horsepower, with governor. Final drive by side chains to rear wheels. Eisemann magneto, automatic spark advance on all models; front axle and rectangular dead rear axle on all models; tire sizes, 36 x 4 inches solid in front, 36 x 3½ inches solid dual, with option of 36 x 6 solid single in rear on two-ton truck; 36 x 5 inches solid front, 36 x 5 solid dual rear on 4-ton truck, 36 x 6 inches solid front and 36 x 6 inches solid dual rear on 6-ton truck; gasolene capacity, 20 gallons on all models.

Prices—Chassis, 2-ton, $2,850; four-ton, $3,750; 6-ton, $4,400, which includes a three-passenger driver's seat with top over seat.

Changes from Previous Construction—Diagonal cross members at rear end of frame added for strength; wood bumper continuous with front of frame; new style jackshaft bracket with separate anchorage for radius rods where formerly radius rods were anchored to the jackshaft; gasolene tank now at rear of seat cage; new type hot air carburetter on all models; addition of a governor on all models; brakes on ends of jackshaft on the 2-ton model, where it was formerly a single emergency brake on the differential; all former motor suspension was rigid, motor with transmission is now mounted on a sub-frame with double coil springs forward, which pivots at the rear.

Selling Points—Motor under seat, which permits shorter wheelbase without loss of

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loading space and allows shorter turning radius; swinging seat cage, which allows easy access to motor; flexible power plant suspension; short wheelbase obviates long shafts in the drive line, doing away with vibration and twisting strains; auxiliary spring over the rear axle, coming into play only when truck is loaded nearly to its full capacity.

Equipment — Three-passenger driver's seat with tufted, pleasure-car-type cushions; three-bow folding top, storm front and side curtains, side and tail oil lamps, horn and complete set of tools, jack and oil can in large tool box.

MOGUL.

Mogul Motor Truck Co., Inc., Chicago.

Models—Four chassis models; one of 2 tons, one of 4 tons and two of 6 tons capacity each. Wheelbases: 2-ton, 118 inches; 4-ton, 142 inches; 6-ton short, 154 inches, and 6-ton long, 188 inches. Chassis weights: 2-ton, 4,700 pounds; 4-ton, 8,600 pounds; 6-ton short, 10,000 pounds, and 6-ton long, 11,000 pounds. Tread of 2-ton, 56 inches; of all other models, 62½ inches. Motor in 2-ton, 33 horsepower, L-head type, cylinders cast in single block; bore and stroke, 4⅛ x 5¼ inches. Motor in 4-ton, 60 horsepower, L-head type, cylinders cast in pairs; bore and stroke, 5 x 5¾ inches. Motor in both 6-ton models, 60 horsepower, L-head type, cylinders cast in pairs; bore and stroke, 5¼ x 5¾ inches. Clutches on all models, single dry disk type. Gearsets in 4-ton and in both 6-ton models, three-speed, progressive type; in 2-ton, three-speed, selectively controlled. Final drive by side chains in all models. Tires on 2-ton, 36 x 3½ single front and 36 x 5 dual rear; on 4-ton, 36 x 6 single front and 36 x 5 dual rear; on both 6-ton models, 36 x 6 single front and 40 x 6 dual rear. Gasolene capacity, in 2-ton, 19 gallons; all others, 25 gallons.

Prices—Chassis, 2-ton, $2,800; of 4-ton, $3,800; of 6-ton, short wheelbase, $4,400; and of 6-ton, long wheelbase, $4,700.

Selling Points — No freakishness—only standard engineering practice in construction; very large brakes, heavy tires, motor under seat and floor, giving short over-all length in proportion to wheelbase.

M'INTYRE.

W. H. McIntyre Co., Auburn, Ind.

Models—Five chassis models; capacity, 1,000 pounds (two types), 1,500 pounds, 1½, 3 and 5 tons. Wheelbases and treads, 1½-ton, 120 or 144 inches and 56 inches; 3-ton, 144 or 168 inches and 62 inches; 5-ton, 144 or 168 inches and 70 inches. Chassis weights, 3,600, 5,000 and 6,200 pounds, respectively, for 1½-, 3- and 5-ton trucks. One of the 1,000-pound models has a two-cylinder motor and the other a four-cylinder motor. Motor of 1½-ton and 3-ton, L-head type, block-cast cylinders, 4¼ x 5¼ inches, bore and stroke. Motor of 5-ton, L-head type, pair-cast cylinders, 4½ x 5½ inches, bore and stroke. Dry disk clutches, three-speed selectively controlled gearsets and side chain final drive in the three larger models. Tires 1½-ton, 34 x 3½ single front and 36 x 3 dual rear; 3-ton, 36 x 4 single front and 36 x 4 dual rear; 5-ton, 36 x 5 single front and 36 x 5 dual rear.

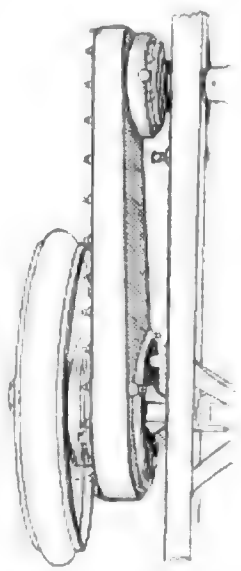
Prices—Chassis, 1,000-pound, two-cylinder, $600; 1,000-pound, four-cylinder, $800; 1½-ton, $1,500; 3-ton, $3,200; 5-ton, $4,250.

Equipment—Lamps, horn, tools and steel tool box.

NATCO.

National Motor Truck Co., Bay City, Mich.

Models—One chassis model, capacity 1 ton. Chassis weight, 2,700 pounds. Wheelbase 104 inches. Cylinders of the L-head type, block-cast; bore and stroke 3½ x 5



NATCO CHAIN CASE

inches, 20 horsepower. Three-speed selective gearset and final drive through side chains. Solid rubber Q. D. tires, 36 x 3½ inches, front and rear. Motor under footboard. Gasolene capacity, 15 gallons.

Prices—Chassis, $1,925.

Changes from Previous Construction—S. A. E. steel equipment adapted.

Selling Points—Compact and simple long-stroke motor accessibly located, roller and annual ball bearings at important points, neat and substantial cases with removable doors, left drive and center control, driver's seat accessible from both sides and only 37 inches from ground, short wheelbase, equal distribution of weight and moderate overhang, encased chains.

Equipment—Windshield, side and tail lights, horn, jack, and tools.

KOEHLER.

H. J. Koehler S. G. Co., New York.

Models—One chassis model; capacity 1,600 pounds. Weight, 2,000 pounds. Wheelbase, 86 inches; tread, 58 inches. Motor is two-cylinder opposed, horizontal, placed under body with cylinders crosswise; horsepower, 22 to 24; bore, 5¼ inches; stroke, 4 inches. Planetary transmission with side chain final drive. Wheels, 36-inch front and 38-inch rear, with 2-inch tires. Gasolene capacity, 16 gallons.

Prices—With open body, $750.

Changes from Previous Construction—None.

Selling Points—Simplicity, good construction, good materials, reasonable price.

SMITH-MILWAUKEE.

A. O. Smith Co., Milwaukee, Wis.

Models—Two chassis models; capacity, 3½ tons and 6 tons. Wheelbase and tread same in both, 168 inches and 68 inches. Both motors of the T-head type with pair-cast cylinders; in the smaller truck 50 horsepower, 5 x 5¾ inches bore and stroke; in the larger, 60 horsepower, 5¼ x 5¾ inches bore and stroke. Both motors governed. Three-plate dry disk clutches, three-speed selectively controlled gearsets, with herringbone gears and final drive by worm in both models. Individual clutch system of rear control. Tires, 3½-ton truck, 36 x 5 single front and 36 x 5 dual rear; 6-ton truck, 36 x 6 single front and 40 x 6 dual rear. Gasolene capacity, 26 gallons, both models.

Selling Points—Worm drive to full-floating rear axles, motors under governor control, herringbone gears, always in mesh and idle on high speed; cast steel wheels, substantial, hard-service construction throughout.

Equipment—Storage battery, electric head and tail lights, exhaust horn, and tools.

KISSEL.

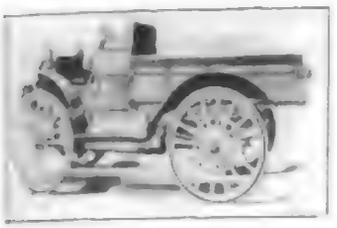
Kissel Motor Car Co., Hartford, Wis.

Models—Six chassis models of 1,500 pounds, 1, 2, 3, 4 and 5 tons capacity, respectively; wheelbases, 120, 132, 140, 144 and 156 inches, respectively, the wheelbases of the 4 and 5 ton trucks being the same. Chassis weights, 2,500, 3,000, 4,500, 5,300, 5,700 and 6,000 pounds, respectively. All motors of the L-head type, four-cylinder; 30 horsepower on 1,500 pound car, 40 horsepower on 1 and 2 ton trucks and 50 horsepower on the three larger. Bore and stroke of 30 horsepower, 4⅛ x 4¼; of 40 horsepower, 4½ x 5¼; and of 50 horsepower, 4⅞ x 5. Shaft drive on two smaller models; chain drive on all others. Forged steel front axles on all models; rear axles full floating in shaft driven models and solid steel in chain models. Solid tires on all models; rear tires dual on chain driven models. Gasolene capacity, 20 gallons in three smaller models and 25 gallons in three larger.

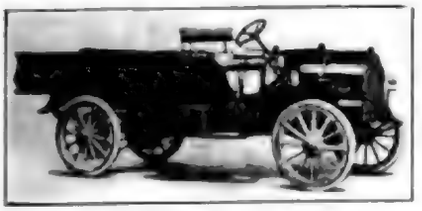
Prices—1,500 pound, $1,500; 1 ton, $2,000; 2 ton, $2,750; 3 ton, $3,350; 4 ton, $3,650; 5 ton, $4,350, all without bodies. With standard stake bodies, $125 extra on two smaller models and $150 extra on all others.

Changes from previous construction—

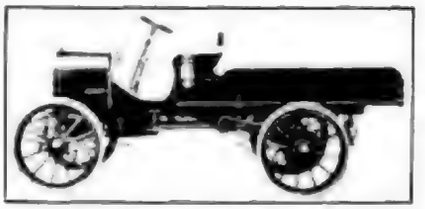
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I. H. C



SANFORD



SULLIVAN

Timken differential and gearset in 3 ton model, jack or auxiliary spring on 4 and 5 ton models. S. A. E. bands on demountable rims. Larger cooling fans and larger motor bearings all around.

Selling Points—Four-speed gearset on all but smallest model, permitting reasonable speed without racing engine when running gear. Differential lock on four larger trucks, permitting the locking of driving wheels to assist in getting out of holes, etc.; operated from driver's seat. Vanadium steel throughout all parts. Heavy, substantial frame construction throughout, with ample margins of safety. Particular attention given to service facilities, branches having specially equipped service buildings.

Equipment—Two oil dash lamps, oil tail lamp, tool rack and complete set of tools.

SERVICE.

Service Motor Car Co., Wabash, Ind.

Models—Three chassis models: 1,500 pounds and 1½ tons capacity. Wheelbase of smaller models, 115 inches; larger model, 130 inches. All four-cylinder, block cast L-head, of the same design, differing only in dimensions. The two smaller models have 30-horsepower motors with bore and stroke 4½ x 5½ inches; the larger model, 40-horsepower, bore and stroke not given. No clutch; transmission through balanced friction disk system, disks with shafts on ball bearings. Final drive by side chains on 1,500-pound car, 36 inches with 3-inch solid clincher tires; 1½-ton model, 34 inches front with 3-inch front and 3½-inch rear wheels on 1½-ton model, 34 inches rear with 3½-inch front and rear solid tires. Gasoline capacity, 23 gallons.

Prices—Chassis, 1,500 pounds capacity, $1,250; 1½ tons capacity, $1,475; 1½ tons capacity, $1,625.

Changes from Previous Construction—Radiators suspended on springs, roller and imported ball bearings throughout, hand forged rear axle in 1½-ton truck, nickel and black trimmings on all cars.

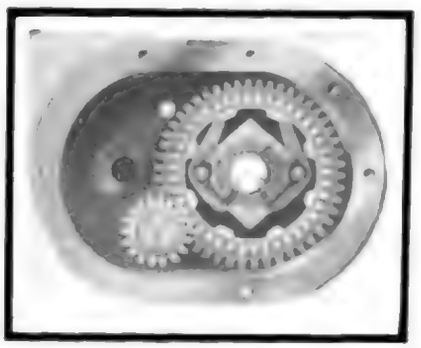
Selling Points—Double balanced friction drive, no clutch, no gears and any speed desired. No differential. No malleable iron castings; high grade material throughout.

Equipment—Two large acetylene headlights, bull's-eye side lamps, tail lamp, gas generator, tools, jack, extra chain links and oil can on all models.

I. H. C.

International Harvester Co. of America, Inc., Chicago.

Models—Two chassis models, each of



I. H. C. GEARSET

1,000 pounds capacity, differing only in motor cooling system and in cylinder bore and wheel diameters. Both motors have two horizontal opposed cylinders and both rated at 20 horsepower. Air-cooled motor, 5 x 5 inches bore and stroke; water-cooled motor, 4½ x 5 inches bore and stroke. Engine under body. Wheelbase 90 inches. Frame, wood re-enforced, with angle iron sub-frame. Two-speed gearset with individual dog clutches and internal ratchets; single chain drive from gearset to countershaft and side chains to rear wheels. Wheels 38 inches front and rear, with 2-inch side wire tires, or 38 inches front and 42 inches rear with 1½-inch side wire tires. Gasolene capacity in both models, 10 gallons.

Changes from Previous Construction—Minor details only.

Selling Points—Simple single lever control, double ignition system, motor simple, durable and accessible. Service branches at 101 branch houses in the United States and Canada.

Equipment—Two gas headlights and gas generator, three oil lamps, horn and tools.

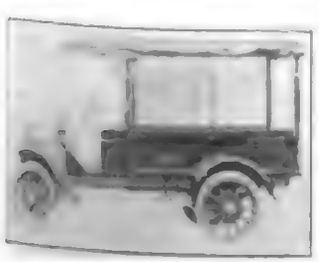
POPE-HARTFORD.

The Pope Mfg. Co., Hartford, Conn.

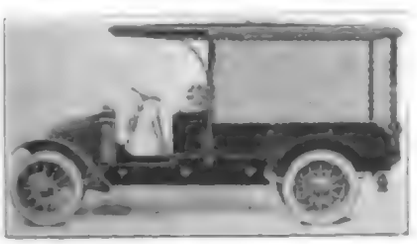
Models—Two chassis models of 3 and 5 tons capacity. Wheelbases of 3-ton truck, 138½ inches on standard 12 or 14-foot chassis, 160 inches on 16-foot chassis; wheelbases of standard 14 or optional 12-foot chassis, 140 inches; special 16-foot chassis with wheelbase of 160 inches. All motors Pope-Hartford long-stroke 50-horsepower, mounted on a sub-frame at forward end of chassis, where it is readily accessible for inspection and adjustment. Drive by side chains. Front axle solid forging I-beam type of extra heavy construction; rear axles solid forging, rectangular section of especially heavy construction. Tires solid single tread front, dual tread rear. Gasolene capacity, 20 gallons.

Prices—Chassis, 3-ton, $3,350 to $3,475, according to wheelbase; 5-ton, $4,350 to $4,475, according to wheelbase.

Changes from Previous Construction—Five-ton truck an entirely new model, built on same general principle as 3-ton truck. Motors increased from 40 horsepower to 50 horsepower; four-speed selective sliding transmission instead of three-speeds; larger front tires; two heavy duty auxiliary coil springs over rear axle in place of cross spring, to provide for overload; wheelbases increased by a foot or more and additional lengths provided; front axle dropped to permit lower engine position; brake sur-



BROWN



STEWART



BROWN

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faces increased; gasolene tank increased in size.

Selling Points—Ease of operation and control, left side drive, right hand control, short turning radius, accessibility of motor and all other parts, oversize wheels and tires, powerful, long-stroke engine, low gasolene and oil consumption, powerful brakes, large loading space compared to length of truck, large fuel, oil and water supply.

Equipment—Top, storm curtains, horn, oil side and tail lights, hub odometer, tool box and full set of tools.

STERNBERG.

Sternberg Mfg. Co., Milwaukee, Wis.

Models—Four chassis models, of 2, 3, 4 and 5 tons capacity. The two smaller trucks are equipped with a four-cylinder L-head motor with cylinders cast in pairs, having a bore of 4¼ inches and a stroke of 6¾ inches. The 2-ton has a wheelbase of 116 inches or longer for special bodies, and has 34 x 4-inch tires on front wheels and 36 x 5-inch single or 36 x 3½-inch duals in rear. The 3-ton is equipped with 36 x 4-inch tires in front and 40 x 4-inch duals in rear, and has a wheelbase of 130 inches. The 4- and 5-ton trucks have a motor of four cylinders, cast in pairs, L-head, with a bore of 4½ inches and a stroke of 6¾ inches. The 4-ton has a wheelbase of 144 inches and 36 x 5-inch tires in front and 40 x 5-inch duals in rear. The 5-ton also has a 144-inch wheelbase, but 36 x 6-inch tires in front and 42 x 6-inch duals in rear.

Prices—Chassis, 2-ton, $2,800; 3-ton, $3,400; 4-ton, $4,000, and 5-ton, $4,500.

Selling Points—Motor, clutch and transmission, together with jackshaft, all carried in a sub-frame of channel steel which, in turn, is suspended in the chassis at three points, preventing disalignment due to warping of the frame in passing over obstructions.

Equipment—Seat and cushions, 8-inch electric head lights and tail light, storage battery, Klaxonet horn, hub odometer, and tools.

MODERN.

Bowling Green Motor Car Co., Bowling Green, O.

Models—Three chassis models; capacity, 1,000 pounds, 1,500 pounds and 1½ tons. Wheelbases: 1,000-pound, 112 or 120 inches; 1,500-pound, 120 or 136 inches; 1½-ton, 136 inches. Motor in 1,000-pound, 25 horsepower, four block-cast cylinders, bore and stroke, 3¾ x 4½; in 1,500-pound, block-cast cylinders, 3¾ x 5¼ bore and stroke, 35 horsepower. Motor in 1½-ton, same as 1,500-pound. All have motors under hoods in front. All models have cone clutches, three-speed selectively controlled gearsets and final drive by side chains. The 1,000-pound model is also with shaft drive. Tires, 1,000-pound, 33 x 3½ front and rear; 1,500-pound model, 36 x 3 front and 36 x 3½ rear; 1½-ton, 36 x 3½ front and 36 x 4 rear.

Prices—Chassis, 1,000-pound, chain drive, $1,225; shaft drive, $1,325; 1,500-pound, $1,625; 1½-ton, $1,850.

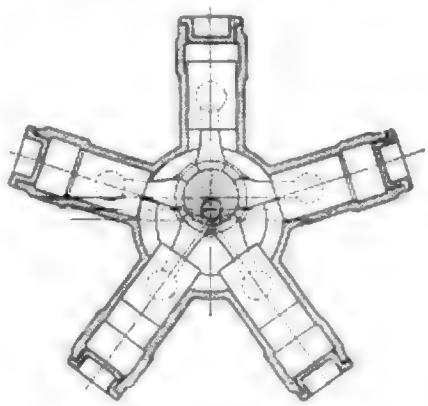
Changes from Previous Contsruction—Radius rods free to give to strains tending to bend them instead of being rigid; improved ignition system; all gears ⅛ inch wider face; full-floating jackshaft; working parts formerly open now are all enclosed.

Equipment—Three oil lamps, horn, jack, and set of tools.

LA FRANCE.

Hydraulic Truck Sales Co., New York.

Models—One chassis model; capacity, 5 tons. Wheelbase, 143 inches; tread, forward wheels, 66 inches; rear wheels, 68 inches. Chassis weight, 8,000 pounds. Motor, 48 horsepower, bore and stroke 5½ x 6 inches; cylinders cast in pairs. Transmission, Manly hydraulic, any speed, single lever control. Final drive by side chains from jackshaft. Tires, block type, 36 x 5 inches front and 38 x 9 inches rear. Gasolene tank capacity, 22 gallons.



MANLY PUMP

Selling Points—Hydraulic transmission, giving any speed between minimum and maximum with greatest power at lowest speed; single lever control of all speeds, with simple forward and backward movement; no gears to shift; transmission acts as a brake; extremely substantial construction of the truck throughout.

MAIS.

Mais Motor Truck Co., Indianapolis, Ind.

Models—Four chassis models of 1½-, 2, 2½- and 3-ton capacity, respectively. Wheelbases of 119, 132, 145 and 160 inches. Wheelbase of the 1½-ton optional, either 119 inches or 132 inches. Wheelbase of 2-ton optional, either 132 or 145 inches. Chassis weights, 5,100, 5,200, 5,300, 5,400, 5,500 and 5,600 pounds, respectively, according to their various wheelbases. All motors of the T-head type, four-cylinder, 40 horsepower, bire and stroke 4 x 5¼ inches. Unit power plant. Final drive through internal gears in rear wheels.

Prices—1½-ton, 119-inch wheelbase, $2,750; 1½-ton, 132-inch wheelbase, $2,800; 2-ton, 132-inch wheelbase, $2,950; 2-ton, 145-inch wheelbase, $3,000; 2½-ton, 145-inch wheelbase, $3,200; 3-ton, 160-inch wheelbase, $3,400.

Changes from Previous Construction—I-beam axle in place of tubular on 2-ton and 3-ton trucks; centrifugal water pump in place of the gear pump; pressed steel frame on the 2-, 2½- and 3-ton models, heavier motor and transmission support for torque tubes, heavier differential on 2½-ton and 3-ton models, increased size of spindles on the 2-, 2½- and 3-ton models; governor on transmission setting the speed at from 12 to 15 miles per hour, 5-inch dual tires on the 3-ton truck and a few minor changes necessitated by the use of the pressed steel frames.

Equipment—Two oil lamps, one oil tail lamp, jack, and complete set of tools and spare parts and pressed steel tool box.

LAUTH-JUERGENS.

Lauth-Juergens Motor Car Co., Fremont, O.

Models—Three chassis models; capacity 1, 2 and 3 tons. Wheelbase of 1-ton, 105 inches; of both larger models, 120 inches. Tread, 56, 58 and 62 inches, respectively. Chassis weights, 1-ton, 2,800 pounds; 2-ton, 5,200 pounds; 3-ton, 5,700 pounds. Motors of all models of the L-head type with separately cast cylinders. Motor in 1-ton has 4 x 4 inches bore and stroke; in 2-ton, 4½ x 5 inches bore and stroke; and in 3-ton, 4¾ x 5 inches bore and stroke. Power transmission in all three cars through three-plate disk clutches, four-speed selectively controlled gearsets and side chains to rear wheels. Tires on 1-ton, 36 x 3½ front and 36 x 4 rear; on 2-ton, 36 x 4 front and 36 x 5 rear; on 3-ton, 38 x 5 single front and 38 x 4 dual rear.

Prices—Chassis, 1-ton, $1,950; 2-ton, $2,700; 3-ton, $3,300.

Selling Points—Special gearset and jackshaft built in the factory; four forward speeds, giving low speed for heavy pulling in emergencies; extremely substantial construction throughout; cab over driver's seat.

Equipment—Lamps, horn, speedometer, jack and tools.

WALTER.

Walter Motor Truck Co., New York.

Models—Six chassis models; capacity 1½, 2, two of 3, 3½ and 5 tons. The 1½, 2, and both 3-ton models have motors of 30-35 horsepower, 4 x 5 bore and stroke. One of the 3-ton models has the motor under a hood and the other has the motor under the seat. Motors in 3½ and 5-ton models, 35-40 horsepower, 4½ x 6 inches bore and stroke. All models have side chain final drive; the two larger have special gearsets of the individual clutch type with friction clutches, three forward speeds. In other models, three-speed selectively controlled gearsets

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and expanding cone clutches. Wheelbases, ... ton, 120 to 144 inches; 2-ton, 132 to 156 inches; 3-ton, with motor under hood, 136 to 180 inches; 3-ton, with motor under seat, 132 to 166 inches; 3½-ton and 5-ton, 156 to 180 inches. Tires, 1½-ton, 36 x 4 front and 36 x 5 rear; 2-ton, 36 x 5 front and 36 x 3½ dual rear; 3-ton models, 36 x 5 front and 38 x 5 dual rear; 3½-ton, 36 x 5 single front and 42 x 5 dual rear; 5-ton, 38 x 5 single front and 42 x 6 dual rear.

Prices—Chassis, 1½-ton, $2,800; 2-ton, $3,000; 3-ton, both models, $3,400; 3½-ton, $3,700; 5-ton, $4,500.

Changes from Previous Construction—Left drive and center control; service brake ... gear on differential and extra large emergency brakes on rear hubs; rear springs ... and underslung; these flanges apply to the 3½-, 5- and 6-ton models.

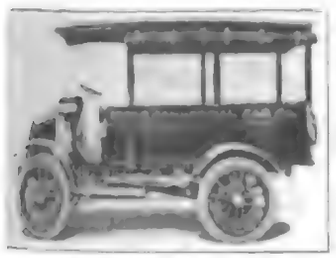
Selling Points—Large wheels and tires on all models; Westinghouse continuous ... type gearset on larger models, giving per... action; gears always in mesh; great strength for weight in all models.

Equipment—Three oil lamps, horn, and ...

KREBS.

Krebs Commercial Car Co., Clyde, O.

Models—Two chassis models, which differ ... only in the matter of final



KREBS DELIVERY WAGON

... 1,500 pounds; wheelbase, ... Motor is 2-cylinder 2-cycle ver... 2½ inch bore and stroke. Cone clutch ... selectively controlled gear... drive by propeller shaft in one ... side chains in the other. ... 4 inches in diameter in both mod... inches front and in rear in ... car and 4 inches front and ... all driven model.

Prices—... either style of drive, $1,...

Selling Points—Simple motor, two-cycle, ... magneto and thermo-si... system; light weight chassis, ... drive, governed motor.

Equipment—Three oil lamps, jack, horn ... set of tools.

SAURER.

International Motor Truck Co., New York.

Models—Two chassis models, 4½ tons and 6 tons capacity. Wheelbase, 153 inches and 159 inches, respectively; tread, 67 inches in both models. Chassis weights, 4½-ton, 5,700 pounds; 6½-ton, 6,900 pounds. The same motor used in both models; 37 horsepower, cylinders 4⅜ x 5½ bore and stroke, T-head type, cylinders cast in pairs. Cone clutch, three-speed selective gearsets and side chain final drive, both models. Wheels, 36 inches front and 42 inches rear; single tires front and dual rear.

Changes from Previous Construction—None.

Selling Points—Light weight in proportion to carrying capacity, great strength owing to scientific distribution of high-grade material, special method of using motor for powerful air-brake, double-jet carburetter of great economy.

REO.

Reo Motor Truck Co., Lansing, Mich.

Models—Two chassis models; capacity, 1,500 pounds and 2 tons. Wheelbases 90



REO TWO-TON TRUCK

inches and 130 inches, respectively. Motor of light car, single cylinder horizontal, placed under the body; bore, 4¼ inches; stroke, 6 inches; horsepower, 10 to 12. Multiple disk clutch, planetary gearset and side chain final drive. Motor of 2-ton truck, four-cylinder cast in pairs, valves in heads; bore, 4 inches; stroke, 4½ inches. Dry multiple disk clutch, selectively controlled three-speed gearset and final drive by side chains. Tires on light car, 2-inch front and 2½-inch rear. Tires on 2-ton truck, 36 x 4 single front and 36 x 3 dual rear, solids.

Prices—1,000-pound model with open body, $760; 2-ton truck, chassis only, $1,800.

Selling Points—The simplest possible type of four-cycle motor in the light truck; moderate price; reliability. Two-ton, up-to-date construction throughout; heavy tire equipment, governed motor, accessibility of all parts.

Equipment—Light model, three oil lamps, horn and set of tools. Two-ton, gas headlights, gas tank, oil side and tail lights, horn, and set of tools.

SELDEN.

Selden Motor Vehicle Co., Rochester, N. Y.

Models—One chassis model; capacity 1 ton. Chassis weight, 2,000 pounds. Wheelbase, 125 inches; tread, 56 inches front and 60 inches rear. Four-cylinder motor under hood in front; block-cast cylinders, 3¾ x 5¼ inches bore and stroke; unit power plant; dry disk clutch, three-speed selectively controlled gearset and side chain final drive. Wheels, 36 inches with 3½-inch front and 4-inch rear tires, solid. Gasolene capacity, 23 gallons.

Price—Chassis, $2,000.

Selling Points—Long stroke motor under control of governor, weight well over rear wheels, giving traction; unit power plant; magneto runs at crankshaft speed; low hung frame, easy springs, and comfortable upholstery.

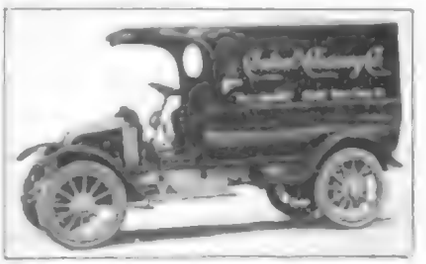
Equipment—Three oil lamps, jack, horn, and set of tools.

LIPPARD-STEWART.

Lippard-Stewart Motor Car Co., Buffalo, N. Y.

Models—One chassis model, capacity 1,500 pounds; wheelbase 115 inches or 125 inches, optional. Tread 56 inches. Four-cylinder block-cast motor of the L-head type, 30 horsepower; cylinders, 3¼ x 5¼ inches bore and stroke. Leather-faced cone clutch, three-speed selectively controlled gearset and shaft drive. Pneumatic tires, 35 x 4½ front and rear. Gasolene capacity, 14 gallons.

Prices—Price, with express, stake or open box body, $1,650.



LIPPARD-STEWART TRUCK

Changes from Previous Construction—Motor 30 horsepower instead of 22; cone clutch instead of multiple disk; clutch unit separated from gearcase; longer rear springs, front springs semi-elliptic instead of full-elliptic; heavier frame and steering gear, pneumatic tires 35 x 4½ instead of 34 x 4. Gasolene capacity 14 gallons instead of 10.

Selling Points—Extreme accessibility of motor due to back-tilting hood and removable front member of frame, radiator back of motor in protected position, left drive, center control and fixed ignition point, easy riding and minimum vibration due to the use of large pneumatic tires, fan-blades on flywheel rim, making separate fan and its driving means unnecessary; auxiliary rear springs backing up main springs when car is loaded; unusually good finish, with nickel trimmings.

Equipment—Three oil lamps, horn, tool kit, tire pump and repair outfit. Special equipment is furnished with specially constructed bodies.

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DIAMOND T.

Diamond T Motor Car Co., Chicago, Ill.

Models—Three chassis models; capacity, 1½, 3 and 5 tons. Motor of 1½-ton, 30 horsepower; 3-ton, 4½ x 5½ inches bore and stroke; 5-ton, 5 x 5½ inches bore and stroke. Transmission elements in 1-ton, multiple disk clutch, three-speed selectively controlled gearset and final drive by worm. In the two larger models the same type of clutch and gearset, but final drive is by side chains. Tires, 1½-ton, 26 x 4 front and 36 x 5 rear; in 3-ton, 36 x 5 single front and 36 x 5 dual rear; in 5-ton, 36 x 6 single front and 36 x 6 dual rear.

Prices—Chassis: 1½-ton, $2,250; 3-ton, $3,250; 5-ton, $3,500.

Selling Points—Special truck type motors of ample power; worm drive in smallest model, with English imported worm; heavy tire equipment.

Equipment—Three oil lamps, horn, jack and set of tools.

UNITED STATES.

United States Motor Truck Co., Cincinnati, O.

Models—Two chassis models, 2 tons and 3 tons capacity. Two-ton truck has motor with bore and stroke of 4⅛ x 5¼ inches, block-cast cylinders, motor speed under control of automatic governor. Three-ton truck has motor with cylinders of 4½ x 5½ inches bore and stroke, cylinders cast in pairs; automatic speed governor. Change-speed gearset of the sliding clutch type, in both models, with gears always in mesh; selective control. Final drive by side chains. Demountable solid base tires on all models, S. A. E. rims, single on front wheels and dual on rear.

Prices—Chassis, with seat, painted, two-ton, $2,800; three-ton, $3,500.

Changes from Previous Construction—Former 1½-ton model discontinued and replaced by the new 2-ton model. All lamps hung on spring brackets.

Selling Points—Engine on sub-frame with three-point suspension, two of the points being on coil springs. Three-point support for gearcase, with 5-inch ball-and-socket joints. Special protection against distortion throughout chassis. Radiator on springs. Specially effective brake equalizers.

SANFORD.

Sanford Motor Truck Co., Syracuse, N. Y.

Models—One chassis model, capacity 1 ton; weight with body, 3,100 pounds. Wheelbase, 106 inches; tread, 56 inches. Motor of the unit power plant type on three-point suspension. Cylinders of the L-head type, cast in pairs; bore and stroke, 4 x 4½ inches. Clutch, 16-disk, dry type, enclosed with flywheel in casing that connects motor and gearcase. Gearset, three-speed selective; final drive by side chains. Wheels, wood artillery, special square-spoke type. Tires, solid, 36 x 3½ front and rear. Right-hand steer and control. Gasolene capacity, 14 gallons.

Prices—Chassis, $1,600 with stake or flare-side body, $1,750.

Changes from Previous Construction—Wheel spokes made square instead of oval.

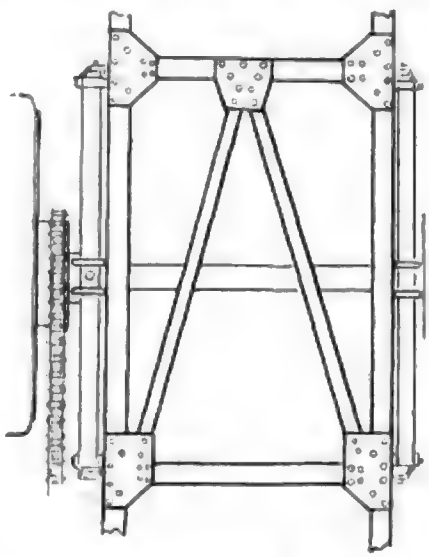
Selling Points—Well balanced construction and consequent even distribution of weight on tires, prolonging tire life. Chains, sprockets and roller bearings extra large throughout; the chains are of the size generally used for 1½- and 2-ton trucks. Large loading space and short wheelbase; the truck is easy to handle in traffic, rides well and runs quietly.

Equipment—Two side lamps, tail light and complete set of tools.

VELIE.

Velie Motor Vehicle Co., Moline, Ill.

Models—Four chassis models; capacity, 1,500 pounds, 1 ton, 2 tons and 3 tons.



VELIE REINFORCED FRAME

Wheelbases, 1,500-pound, 115 inches, 2-ton and 3-ton, either 148 or 172 inches. Motor in 1,500-pound, 40 horsepower, four cylinders, 4½ x 5¼ inches bore and stroke; in 2- and 3-ton, 4½ x 5½ inches bore and stroke; cylinders cast in pairs. Disk clutches and selectively controlled three-speed gearsets in all models; shaft drive in 1,500-pound and side chains in 2- and 3-ton models. Tires on smallest model, 34 x 4 pneumatic front and rear; on 2-ton, 36 x 5 single front and 36 x 3½ dual rear, pneumatic or cushion; on 3-ton, 35 x 5 single front and 40 x 5 dual rear, solids. Gasolene capacity of 2- and 3-ton, 15 gallons.

Prices—1,500-pound with open body, $1,600; 2-ton chassis, $2,800; 3-ton chassis, $3,350.

Changes from Previous Construction—None.

Selling Points—Concentration of weight on rear wheels, outside spring suspension which lowers frame, unusually heavy framing throughout, spring supported cradle for radiator; pedal operated differential lock; short turning radius.

Equipment—Lamps, horn and tools.

SAMPSON.

United States Motor Co., New York.

Models—Four chassis models; capacity, 1,000 pounds, 1½ tons, 3 and 5 tons; chassis weights, 2,000, 4,200, 5,700 and 8,500 pounds respectively. Wheelbases, 1,000-pound, 94 inches; 1½-ton, 110 inches; 3-ton, 140 inches; 5-ton, 155 inches. Treads, 56, 58 and 66 inches, respectively, for the three smaller sizes; on the 5-ton, 68 inches front and 72 inches rear. Motor in 1,000-pound, two-cylinder horizontal, opposed type, 18 horsepower, 4¼ inches bore and stroke; in 1½-ton, 25 horsepower, 4 cylinders cast in pairs, 4 x 5 inches bore and stroke; in 3-ton, 33 horsepower, cylinders cast in pairs, 4½ x 5½ inches bore and stroke; in 5-ton, 40 horsepower, cylinders cast in pairs, 5 x 5½ inches bore and stroke. Power transmission on 1,000-pound, dry disk clutch, three-speed selective gearset and shaft drive; on 1½-ton, disk clutch running in oil, three-speed selective gearset and side chains; on 3-ton, disk clutch running in oil, three-speed selective gearset and side chains; on 5-ton, cone clutch with cork inserts, four-speed selective gearset and side chain drive. All side chains in metal casings. Tires on smallest model, 34 x 4 inch, pneumatic, front and rear; on 1½-ton, 32 x 4 front and 34 x 5 rear solids on 3-ton, 34 x 4 single front and 36 x 4 dual rear; on 5-ton, 36 x 6 single front and 36 x 6 dual rear. Gasolene capacity of 1,000-pound, 15 gallons; of two next larger, 19 gallons; on 5-ton, 30 gallons.

Prices—Chassis, 1,000-pound, $1,400; 1½-ton, $2,200; 3-ton, $3,400; 5-ton, $4,700.

Changes from Previous Construction—None.

Selling Points—Encased side chains, differential locks, gear-shifting interlock, unusual strength and accessibility of all parts, motor and radiator on heavy spiral springs, gearset and differential units on three-point suspension, very large bearings throughout.

MERCURY.

Mercury Mfg. Co., Chicago.

Models—One chassis model; capacity, 1,000 pounds. Motor, two horizontal opposed cylinders, 14 horsepower, 4¼ inches bore and 4 inches stroke. Planetary change-speed gear in unit with motor; single lever control. Final drive by side chains. Front wheels, 38 inches and rear wheels 40 inches in diameter; solid tires Gasolene capacity, 6 gallons.

Prices—With open express body, $750.

Changes from Previous Construction—Roller instead of ball bearings for wheels.

Selling Points—Interchangeability of all parts, guaranteed low tire cost, simplicity of car throughout, high-grade alloy steels employed.

Equipment—Two oil dash lamps, tail lamp, set of tools.

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WHITE.

The White Co., Cleveland, O.

Models—Four chassis models; capacity, 1,500 pounds, 1½ tons, 3 tons and 5 tons, respectively. Wheelbases, 120, 144, 144 and 162 inches, respectively. Tread, 56 inches in two smaller models; in 3-ton truck, 65¼ inches front and 61½ inches rear, measuring to centers of inside tires; in 5-ton truck, 69¼ inches front and 61¾ inches rear, measuring to centers of inside tires. All motors of the same construction, with block-cast cylinders of the L-head type. The same motor is used in the three smaller models; bore and stroke, 3¾ x 5⅛ inches. Motor of 5-ton truck 4¼ x 5¾ inches, bore and stroke. Four-speed gearsets in all models; shaft drive in two smaller machines and side-chain drive on two larger. Wheels of 1,500-pound model, 34 inches, with 4½-inch pneumatic tires front and rear, of 1½-ton model, 36 inches front and rear with pneumatic tires, 4½-inch single front and 4½-inch dual rear; of the 3-ton model, 36 inches front with 5-inch solid tires and 40-inch rear with 4-inch dual tires; and of 5-ton model, 36 inches front with 5-inch single tires and 40 inches rear with 6-inch dual tires. Gasolene capacity of 1,500-pound model, 14½ gallons; of 1½-ton, 3-ton and 5-ton, 18 gallons.

Prices—Chassis, 1,500 pound model, $2,500; 1½-ton model, $3,000; 3-ton model, $3,750; of 5-ton model, $4,500.

Selling Points—Steel wheels on two larger models; pneumatic tires on two smaller models. Four-speed gearsets on all models. Compact and clean motors with block-cast cylinders; valve mechanism is completely enclosed.

Equipment—Smallest model, acetylene headlights and gas tank or generator, oil side and tail lamps, horn, jack and tools. Other models seat and cushion, side and tail oil lamps, horn, jack, full tool equipment.

STANDARD.

Standard Motor Truck Co., Detroit, Mich.

Models—One chassis model; capacity 3 tons; chassis weight, 6,100 pounds. Wheelbase, standard, 144 inches; longer and shorter lengths to order. Motor, 40 horsepower, L-head type, bore and stroke 4⅛ x 5½ inches, unit power plant. Multiple dry disk clutch, three-speed selective gearset, final drive through side chains. Wheels 36 inches in diameter all round with single 5-inch tires front and double 5-inch tires rear. Tread of rear wheels, 71⅛ inches; of front wheels, 65 inches.

Prices—Chassis, $2,750.

Changes from Previous Construction—None.

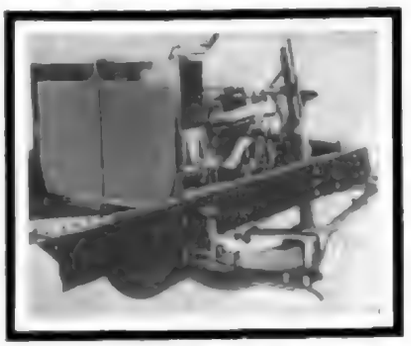
Selling Points—Standard parts used throughout. No radical features. Governed motor, located under seat. Choice of three wheelbase lengths besides standard (at extra cost). Unit power plant. Center control.

Equipment—Oil side and tail lamps, horn, tools, tool box, jack and oil can.

UNIVERSAL.

Universal Motor Truck Co., Detroit, Mich.

Models—Three chassis models; capacity 1, 2 and 3 tons. Wheelbases, 1-ton, 124 inches; 2-ton, 120 or 132 inches, optional; 3-ton, 132 or 150 inches, optional. Motor, 1-ton, cylinders of the L-head type, cast in a single block, 3¾ x 5 inches bore and stroke, 30 horsepower. The 2-ton and 3-ton trucks have the same 36-horsepower motor with T-head cylinders cast in pairs, 4 x 5½ inches bore and stroke, and also the same dry disk clutch, three-speed selectively controlled gearset and side chain final drive. The 1-ton truck has a single plate dry disk clutch, three-speed selective gearset and worm drive, to full-floating rear axle. Wheels, 1-ton truck, 34 inches diameter with 3½-inch tires front and 5-inch rear. Wheels on 2-ton, 36 inches in diameter with 4-inch single tires front and 3-inch duals rear. Wheels of 3-ton, 36 inches in diameter, with 5-inch single tires front and 4-inch duals rear. Gasolene capacity, all models, 22 gallons.



UNIVERSAL RADIATOR MOUNTING

Prices—Two-ton chassis, either wheelbase length, $2,750; 3-ton chassis, either wheelbase length, $3,400.

Selling Points—In two larger models, radiator is placed back of engine, where it is protected; motor is easy of access. Motors under control of automatic governors built into the crankcase and inaccessible to drivers; in all models, compact, clean-designed motors hung on three-point suspensions; silent worm drive on 1-ton model, eliminating chains and chain noises.

Equipment—Three oil lamps, horn, jack, and set of tools.

G M C

General Motors Truck Co., Pontiac, Mich.

Models—Three chassis models, capacity 1¼, 2 and 3½ tons. Wheelbases, 126, 142 and 138 inches, respectively; chassis weights, 4,070, 5,050 and 6,500 pounds, respectively. Motor in 1¼-ton, four cylinders, block-cast, T-head type, 4 x 6 inches bore and stroke. Motor in 2-ton, four cylinders, block-cast, valves in heads, 3½ x 5¼ inches bore and stroke. Motor in 3½-ton, four cylinders cast in pairs, L-head type, 5 x 5 inches bore and stroke. Three-speed gearsets and side chain final drive in all models. Tires on 1¼-ton, 34 x 3 inches front and 36 x 4 rear; on 2-ton, 34 x 4 single front and 36 x 3½ dual rear; on 3½-ton, 36 x 5 single front and 36 x 4 dual rear.

Prices—Chassis, 1¼-ton, $2,075; 2-ton, $2,750; 3½-ton, $3,700.

Equipment—Three oil lamps, horn, jack, and set of tools.

HEWITT.

Hewitt Motor Co., New York.

Models—Ten chassis models; capacity, in tons, 1, 1½, 2, 2½, 3½, 4½, 5½ long and short, 7, and 10. Wheelbase and tread of 1- and 1½-ton, 106 inches and 60 inches; 2-ton, 112 inches and 60 inches; 2½-ton, 136 inches and 60 inches; 3½-ton, 128 inches and 68 inches; 4½- and 5½-ton, 138 or 140 inches and 68 inches; 7-ton, 138 inches and 68 inches, and 10-ton, 138 to 164 inches and 68 inches. Motor in 1- and 1½-ton, four-cylinder, 17 horsepower, 3¼ x 4¼ bore and stroke; in 2- and 2½-ton, horizontal, two opposed cylinders, 24 horsepower, 5½-inch bore and 5-inch stroke; in 3½, 4½, 5½, 7 and 10-ton, four-cylinder, 40 horsepower; bore and stroke, 4¼ x 6. Three-speed selective gearsets and cone clutches in 1, 1½, 3½, 4½-ton and longer wheelbase in 5½-ton models. Two-speed planetary in 2 and 2½, short wheelbase in 5½, 7 and 10-ton. Final drive by side chains in all models. Wheels and tires, 1-ton, 36 x 3½ front and 36 x 4 rear; 1½-ton, 36 x 4 front and 36 x 4½ rear; 2-ton, 34 x 4 front and 34 x 3½ rear, latter dual blocks; 2½-ton, 34 x 5 front and 34 x 4 dual blocks rear; 3½-ton, 34 x 3½ front and 40 x 4 dual rear, all block type; 4½-ton, 34 x 4 front and 40 x 5 rear, all dual blocks; 5½-ton, longer wheelbase, 34 x 5 front and 40 x 6 rear, all dual blocks; 5½-ton, shorter wheelbase, 36 x 4 front and 36 x 6 rear, all dual blocks; 7-ton, 36 x 5 front and 36 x 7 rear, all dual blocks; and 10-ton, 36 x 5 front and 44 x 7 rear, all dual blocks.

Prices—1-ton chassis, $1,800; 1½-ton, $2,100; 2-ton, $2,500; 2½-ton, $2,700; 3½-ton, $3,500; 4½-ton, $4,000; 5½-ton, either wheelbase, $4,500; 7-ton, $5,000; 10-ton, $5,500.

Changes from Previous Construction—None.

Selling Points—Wide range of models, including 10-ton capacity; extremely strong construction; heavy duty planetary transmissions, powerful and unusually efficient and economical motors.

Equipment—Three oil lamps, horn and tools.

PIERCE-ARROW.

Pierce-Arrow Motor Car Co., Buffalo, N. Y.

Models—One chassis model; capacity 5 tons. Wheelbase 156 inches, tread 69 inches.

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Motor, 38 horsepower, A. L. A. M. rating, four pair-cast cylinders of 4⅜ x 6 inches bore and stroke. Cone clutch, three-speed selectively controlled gearset and worm drive to rear axle. Tires, 36 x 5 single front and 40 x 6 dual rear. Gasolene capacity, 25 gallons.

Price—Chassis, $4,500.

Changes from Previous Contsruction—Only in minor details.

Selling Points—Worm drive, flexible frame with power plant and gearbox mounted on three-point support, load balanced over rear wheels, with front wheel load practically constant, making easy and uniform steering; noiseless running, exceptionally good material employed.

Equipment—Three oil lamps, horn, jack, and set of tools.

GRAMM-BERNSTEIN.

Gramm-Bernstein Co., Lima, O.

Models—Two chassis models; capacity 2 tons and 3½ tons. Wheelbase of 2-ton truck, 128 inches; tread, 64 inches front and 67½ inches rear. Wheelbase of 3½-ton truck, 140 inches; tread, 67 inches front and 69½ inches rear. Chassis weights, 5,300 pounds and 7,000 pounds, respectively. The same motor is installed in both models. Cylinders of L-head type are cast in pairs; bore and stroke, 4½ x 5½ inches; fitted with governor which holds the speed down to a maximum of 1,000 revolutions per minute. Multiple dry disk clutch and three-speed individual dog-clutch gearset. Final drive by roller side chains. Transmission system the same in both cars except for dimensions. Wheels in both models 36 inches front and rear. Tires on 2-ton truck, 4 inches single front and 3½ inches dual rear; on 3½-ton truck, 5 inches single front and 5 inches dual rear. Gasolene capacity in both models, 20 gallons; tanks hung at rear of chassis.

Prices—Two-ton chassis, $2,600; 3½-ton chassis, $3,400.

Changes from Previous Construction—Both entirely new models.

Selling Points—Long-stroke governed motor, individual clutch gearset with roller and ball bearings throughout; gears always in mesh. Motor mounted on spring-supported sub-frame; motor starter, eliminating cranking.

Equipment—Gray & Davis electric starting and lighting system, electric lamp with extension cord, electric horn, set of tools, and jack.

TRANSIT.

Transit Motor Truck Co., Louisville, Ky.

Models—Four chassis models of 1, 2, 3½ and 5 tons capacity. Wheelbase of 1 ton chassis, 110 inches; all other models, 144 inches. Chassis weights, 1 ton, 3,700 pounds; and 5-ton, 6,200 pounds. All motors of the L-head type, four cylinders. One-ton and 2-ton trucks have 30 horsepower motor with bore and stroke of 3¾ x 5¼ inches; 3½-ton truck has 45 horsepower motor with bore and stroke of 4½ x 5 inches, and 5-ton truck has 55 horsepower motor with bore and stroke of 4¾ x 5½ inches. Final drive by side chains in all models.

Prices—One-ton chassis, $1,850; 2-ton chassis, $2,850; 3½-ton chassis, $3,500; 5-ton chassis, $4,500.

Changes from Previous Construction—Auxiliary springs on all models, S. A. E. bands on demountable rims, and larger rear wheels on the 5-ton truck.

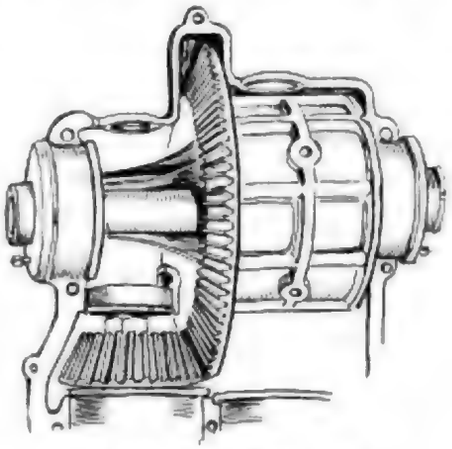
Selling Points—Three-point radiator, sub-frame and jackshaft suspension, supplementary springs front and rear, sealed governors on all motors, enclosed steel cab for the driver.

Equipment—Three oil lamps, horn, jack and set of tools.

MACK.

International Motor Co., New York.

Models—Seven chassis models; capacity, 1, 1½, 2, 2½, 3½, 5 and 7 tons. Three



MACK RIBBED BEVEL GEAR

smaller sizes built with wheelbases optional, ranging from 120 to 162 inches. Motor in three smaller trucks, four cylinders, pair-cast, 4½ x 5½ inches bore and stroke. Mack gearset in all models; selective control, gears always in mesh. Final drive by side chains.

Selling Points—Unusually wide range of sizes and capacities, providing trucks for all classes of service; heavy and extremely substantial gearset; very strong construction throughout.

Equipment—Three oil lamps, horn, jack, and full set of tools, spare valves, springs, spark plugs, bolts and nuts, etc.

ADAMS.

The Adams Bros. Co., Findlay, O.

Models—Two chassis models; 1 ton and 1½ tons capacity. Wheelbase, 121 or 136 inches, optional, the same in both models. Tread, 56 inches. The same 30-horsepower motor is used in both models, which are alike except in strength and weight of load-carrying parts. Cylinders of the L-head type, block-cast; bore and stroke, 3⅞ x 5 inches. Clutch, dry disk. Three-speed selective gearset and side chain final drive. Left steer and center control. Wheels on 1-ton truck, 36 inches front and rear; tires, 3½-inch front and rear. Wheels on 1½-ton model, 36 inches front and rear; tires, 3½-inch single front and 3-inch dual rear. Gasolene capacity, 15 gallons, both models.

Prices—One-ton chassis, either wheelbase length, $2,100; 1½-ton chassis, either wheelbase length, $2,300.

Changes from Previous Construction—Practically none.

Selling Points—Accessibility of motor due to radiator being placed behind; hood, of Renault type, opens backward; radiator protected and engine kept clean; left steer and center control; clutch will start the car gradually, even if let in suddenly. Magneto and water pump at front of motor driven by cross shaft; combined oil filler and gauge at front.

Equipment—Three oil lamps, set of tools, jack and horn.

PATHFINDER.

Motor Car Mfg. Co., Indianapolis, Ind.

Models—One chassis model; capacity, 1,500 pounds. Wheelbase, 120 inches; tread, 56 inches. Motor placed under hood in front; 40 horsepower; four block-cast cylinders, L-head type; 4⅛ x 5¼ inches bore and stroke. Motor, clutch and gearset combined in unit plant. Cone clutch, three-speed selectively controlled gearset and shaft drive. Wheels, 34 inches front and rear, with 4-inch pneumatic tires.

Price—With panel body, $2,000.

Selling Points—Advantages of pleasure car construction combined with the sturdiness required to carry a load of 1,500 pounds at good speed. Very attractive finish.

OLD RELIABLE.

Old Reliable Motor Truck Co., Chicago, Ill.

Models—Three chassis models; capacity, 2, 4 and 5 tons, respectively; wheelbase of 4- and 5-ton, 126 inches; tread, 66 inches. Motor in 2-ton, T-head type, bore and stroke 4¼ x 5 inches; on the two other models, T-head type, cylinders cast in pairs, bore and stroke, 4¾ x 5½ inches, 45 horsepower. Motors located under footboards. Multiple disk clutches, selectively controlled three-speed gearsets and side chain final drive in all models. Tires of 5-ton truck, 36 x 6-inch single front and 36 x 6 dual rear. Gasolene capacity of 4- and 5-ton, 30 gallons.

Prices—Chassis, 2-ton, $2,750; 4-ton, $4,000; 5-ton, $4,500.

Selling Points—Substantial construction along standard lines; moderate over-all length in proportion to wheelbase; cab for driver; powerful long-stroke motors.

SULLIVAN.

Sullivan Motor Car Co., Rochester, N. Y.

Models—Two chassis models; capacity, 1,000 pounds and 1,500 pounds, respectively.

Wheelbase of smaller car, 93 inches; the larger model is built in four wheelbase lengths—93, 105, 111 and 117 inches. Motor horizontal, with two opposed cylinders, placed under hood in front with cylinders across, bore and stroke each 4½ inches; horsepower 18. The same motor is used in both models, as well as the same cone clutch, two-speed planetary gear shaft drive to jackshaft, and side chain final drive. Wheels in both models, 36 inches in diameter with 2 1/2-inch solid tires in front and 3 inches rear.

Prices—1,000-pound chassis, $925; 1,500-pound chassis, with 93-inch or 105-inch wheelbase, $925; 1,500-pound chassis with 111-inch or 117-inch wheelbase, $950.

Changes from Previous Construction—Heavier axles, large Raymond brakes on jackshaft, double universal joint between motor and jackshaft instead of single joint, transmission bolted to jackshaft, larger tires on rear wheels.

Selling Points—Simplicity of construction and accessibility of all parts, ample power for loads carried, choice of various wheelbase lengths; builders have been in the carriage business for 30 years and furnish bodies of all kinds.

Equipment—Three oil lamps, horn and tools.

SCHACHT.

Schacht Motor Car Co., Cincinnati, O.

Models—Six chassis models, 1,500 pounds, 1,800 pounds, 1, 2, 3 and 4 tons capacity. Wheelbases, 1,500-pound, 120 inches; 1,800-pound and 1-ton, 138 inches; 2-ton, 132 inches; 3-ton and 4-ton, 144 inches. The same motor is used in all models. Horsepower, 45 to 50; bore and stroke, 4¼ x 5½ inches; block-cast cylinders. The two smaller models are shaft driven, the 1-ton truck worm driven and the 2, 3 and 4-ton trucks and driven by side chains and jackshaft.

Prices—1,500-pound, with delivery body, $1,600; 1,800-pound, with delivery body, $2,000; 1-ton chassis, $2,300; 2-ton chassis, $2,800; 3-ton chassis, $3,100; 4-ton chassis, $3,300.

Changes from Previous Construction—Larger and more powerful motor; three-bearing instead of 2-bearing crankshaft; cellular radiators and left-hand steer. The worm drive 1-ton truck is a new model.

LITTLE GIANT.

Chicago Pneumatic Tool Co. Chicago, Ill.

Models—One chassis model; capacity 1 ton; weight, 2,100 pounds; wheelbase, 91 inches. Motor, two-cylinder horizontal, opposed cylinders, 18-20 horsepower; bore, 5 inches; stroke, 4 inches. Multiple disk clutch, planetary gearset and final drive by side chains. Wood wheels, with 2-inch tires front and 2½-inch rear, solids. Gasolene capacity, 8½ gallons.

Prices—With open flare body, $1,100.

Selling Points—Simple and powerful motor, adaptability to various bodies and classes of service, efficient lubricating system, with piston pump for circulating oil.

Electric Commercial Vehicles

ATLANTIC.

Atlantic Vehicle Co., New York.

Models—Four chassis models; capacity, 1, 2, 3½ and 5 tons, respectively. Wheelbases, 103, 115½, 135 and 144 inches, respectively. Chassis weights with regular battery equipment, 4,400, 5,700, 7,700 and 9,200 pounds, respectively. Single motor [illegible] transmission, motor to countershaft by silent chain, encased, and jackshaft to rear wheels by roller chains. Standard battery equipment, 1 ton, 44 cells, 13 plates; 2-ton, 44 cells, 17 plates; 3½-ton, 44 cells, 21 plates; 5-ton, 44 cells, 25 plates. [illegible] regular equipment; other [illegible] Wheels and tires: 1-ton, 34 x 4 front and 36 x 4 rear; 2-ton, 34 x 4 front and 36 x 3 dual rear; 3½-ton, 36 x [illegible] 40 x 4 dual rear; 5-ton, 36 x 6 front and 40 x 5 dual rear.

Prices—Chassis with battery, 1-ton, $2,[illegible]; 2-ton, $5,000; 3½-ton, $3,500; 5-ton, $4,[illegible].

Selling Points—40-inch rear wheels on [illegible] models; irreversible, very easy [illegible] steering gear on all models; maximum [illegible] on rear wheels; exceptionally [illegible] springing.

Equipment—Ampere-hour meter, side and [illegible] lamps, bell and set of tools.

FOUR-WHEEL DRIVE.

Four-Wheel Drive Auto Co., Clintonville, Wis.

Models—Two chassis models; capacity, [illegible] and 3 tons. Wheelbase, 1½-ton, 124 inches, 3-ton, 125 inches; tread 56 inches on both. Motor in smaller model, 29 horsepower T-head type, cylinders 4⅛ x 5 inches. In 3-ton, 36 horsepower, T-head type, cylinders 4⅜ x 5½. Governors on both motors. Drive from motor through multiple disk clutch to three-speed gearset of the individual jaw clutch type, with gears always in mesh; silent chain to longitudinal shaft which drives both front and rear axles through bevel gears; differential inside chain case on longitudinal shaft and also on both live axles. Tires on 1½-ton, 36 x 4 inches front and rear; on 3-ton, 36 x 5 inches front and rear.

Prices—Chassis, 1½-ton, $3,600; 3-ton, $4,000.

Selling Points—Drive through all four wheels, giving maximum traction; weight equally distributed and all weight available for traction; gears always in mesh; full-floating axles front and rear; two separate sets of brakes for each pair of wheels; braking effort equally distributed over all four wheels.

Equipment—Three oil lamps, jack, horn, and set of tools.

STUDEBAKER.

Studebaker Corporation, Detroit, Mich.

Models—Six standard electric models with four different power plant equipments for each; one gasolene light delivery car on 20-horsepower pleasure chassis. Electric cars not rated according to ordinary capacity ratings, but the line includes vehicles capable of carrying from 500 pounds to 5 tons. Single motor drive with gear first reduction and final drive through side chains in all models. Tires on the various models are as follows: Model 25 (smallest), 36 x 2½ front and 42 x 2½ rear; model 26, 36 x 3 front and 42 x 3 rear; model 27, 36 x 4 front and 42 x 4 dual rear; model 28, 36 x 5 single front and 42 x 3½ dual rear; model 23, 36 x 6 single front and 42 x 4 dual rear; model 24, 36 x 7 single front and 42 x 4 dual rear. Wheelbases, 74, 92, 111, 113, 113 and 112 inches, respectively.

Changes from Previous Construction—None.

Selling Points—The line is sufficiently comprehensive to give any carrying capacity within the limits; any desired speed or mileage can be had by varying the battery equipment, for which special provision is made; all parts made in the Studebaker factory; simplicity is a special feature; large wheels in all models.

GENERAL VEHICLE.

General Vehicle Co., Long Island City, N.Y.

Models—Six electric chassis models; capacity, 750 pounds, 1,000 pounds, 1 ton, 2 tons, 3½ tons and 5 tons. Wheelbase and tread, of 750-pound wagon, 74 and 52 inches, respectively; of 1,000-pound wagon, 81½ and 55 inches; of 1-ton wagon, 102 and 60 inches; of 2 ton truck, 111½ and 61 inches; of 3½-ton truck, 126 and 65 inches; of 5-ton truck, either 130 or 139 and 69 inches. Single G. E. motor in all models, driving by silent chain to countershaft and side chains to rear wheels; motor, first reduction, chain and countershaft enclosed. G. E. continuous torque controller.

Changes from Previous Construction—None.

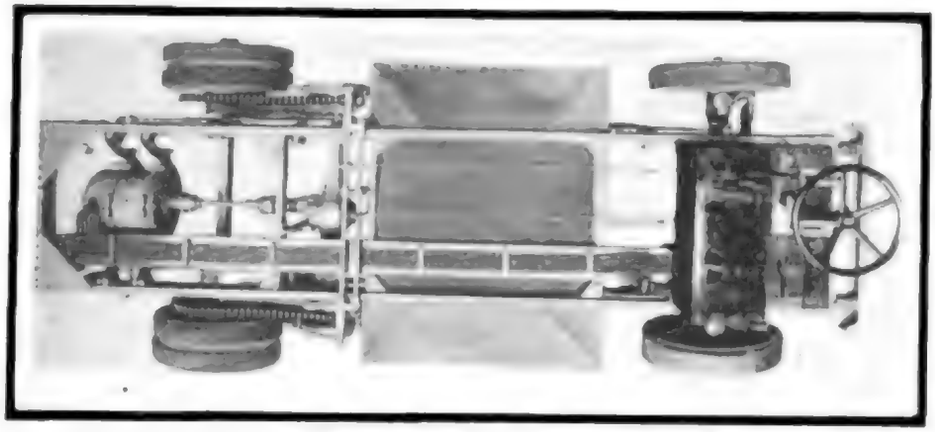
Selling Points—All models standardized. Twelve years experience building electric trucks; all parts readily accessible; only one motor to care for; economical operation and simplicity of control.

BAKER.

Baker Electric Vehicle Co., Cleveland, O.

Models—Five chassis models: capacity, 500 pounds, 1,000 pounds, 1, 2 and 4 tons. Wheelbases: 500-pound, 85 inches, 56-inch tread; 1,000-pound, 102 inches, 56-inch tread; 1-ton, 120 inches, 64-inch tread; 2-

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FIVE-TON WAVERLEY ELECTRIC TRUCK CHASSIS

ton, 135 inches, 68-inch tread. The largest model is a tractor and is designed for hauling trailers. Wheelbase to suit conditions. All models have single motor, driving through silent chain, encased, to jackshaft, and by side chains to rear wheels. Batteries in all but tractor, 42 cells; number of plates per cell, 9 for the two smaller sizes and 13 and 17, respectively, for the 2- and 4-ton; for the tractor, battery is installed to suit working conditions. Tires, 500-pound, 34 x 3-inch solid all round; 1,000-pound, 36 x 3½ solid all round; 1-ton, 36 x 4 single front and 36 x 3 dual rear; 2-ton, 36 x 6 single front and 36 x 3½ dual rear. On tractor, to suit service.

Prices—Chassis, 500-pound, $1,800; 1-000-pound, $1,900; 1-ton, $2,200; 2-ton, $3,-100; 4-ton (tractor), $3,500.

Selling Points — Conservative design, without radical features; uniform design throughout the line; single motor, affording the simplest power equipment; quiet and efficient driving system; accessibility of working parts.

Equipment—Lamps, horn, hub odometer, and tools.

M & P

M & P Electric Vehicle Co., Detroit, Mich.

Models—Two chassis models; capacity, 1,000 and 2,000 pounds. Weight, with panel bodies, 3,000 pounds and 3,900 pounds, respectively. Wheelbases, 100 inches and 112 inches; tread, 56 inches in both models. Same motor in both models; 80 volt, 30 ampere, ball-bearing armature shaft. Motor located under driver's seat, driving to jackshaft through propeller shaft with two universal joints; final drive by side chains. Wiring, resistance, switches and connections under driver's seat, near motor. Battery, 40 cells, 9 plates, in 1,000-pound; 40 cells, 13 plates, in 2-000-pound. Wheels and tires, 33 x 3 solid front and rear on 1,000-pound; 34 x 4 solid front and rear on 2,000-pound.

Prices—Chassis, 1,000-pound, $1,450; 2,-000-pound, $1,850.

Selling Points—Motor, wiring and all electrical connections very accessible; weight equally distributed; easily handled battery; car made from standard parts throughout; short wiring, the longest wire being 36 inches long; special spring construction.

WAVERLEY.

The Waverley Co., Indianapolis, Ind.

Models—Six chassis models; capacities, 600 pounds, 1,000 pounds, 1 ton, 2 tons, 3½ tons and 5 tons. Chassis weights, 1,000 pound truck, 2,975 pounds; 2-ton truck, 5,-200 pounds; 3½-ton truck, 7,200 pounds; 5-ton truck, 9,700 pounds. Wheelbases, 600-pound, 87 inches; 1,000-pound and 1-ton, 97½ inches; 2-, 3½ and 5-ton, 114, 118 and 136 inches, respectively. Tires: 600-pound, 32 x 2½ front and rear; 1,000-pound, 32 x 3 front and 36 x 3 rear; 1-ton, 32 x 3½ front and 36 x 3½ rear; 2-ton, 36 x 4 single front and 36 x 3½ dual rear; 3½-ton, 36 x 6 single front and 36 x 3½ dual rear; 5-ton, 36 x 7 single front and 36 x 5 dual rear. Single motor drive in all models. The three smaller models have silent chain drive from motor to jackshaft and herringbone gear drive from jackshaft to full floating rear axle. The 2-, 3½- and 5-ton trucks have propeller shaft and bevel gear drive to countershaft and side chains to rear wheels. Standard lead battery equipment, 600-pound, 28 cells, 13 plates; 1,000-pound, 42 cells, 11 plates; 1-ton, 42 cells, 13 plates; 2-ton, 42 cells, 17 plates; 3½-ton, 42 cells, 21 plates; and 5-ton, 42 cells, 25 plates.

Prices—With battery and panel body, 600-pound wagon, $1,800; 1,000-pound wagon, $2,250; 1-ton wagon, $2,400; or $2,-250 with stake body; 2-ton truck chassis, $3,000; 3½-ton chassis, $3,500; 5-ton chassis, $4,000. Special battery equipment at special prices.

Changes from Previous Construction—Single motor drive instead of two motors in larger models, new construction of transmission mechanism and new motor positions, longer contact surfaces in controller switches.

Selling Points—Light models have improved silent, efficient drive, completely enclosed, and full-floating axles; all parts protected, rear axle cannot be thrown out of line, all models are of extremely substantial construction and built of the best materials, ball-bearing armature shafts, bridge construction under battery cradles, ample braking surfaces, and facility of operation; very high mileage per battery charge.

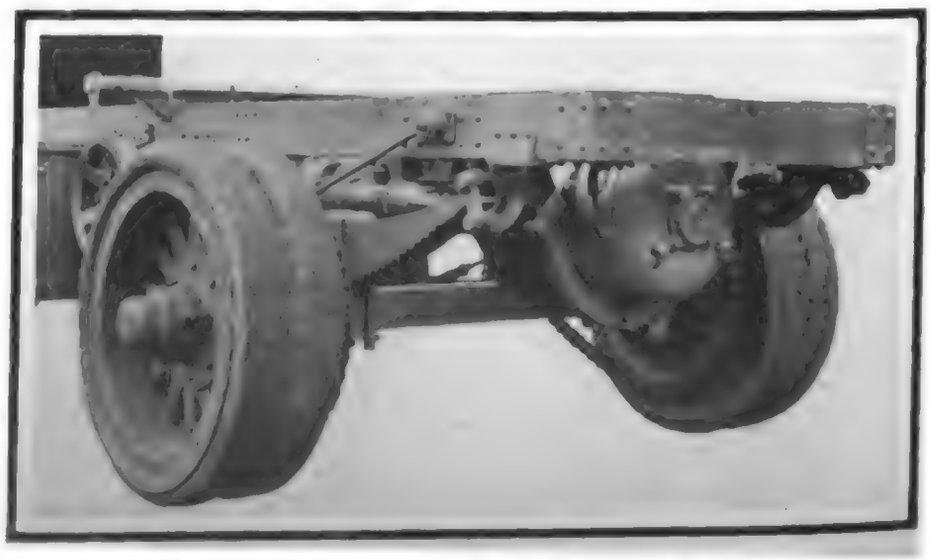
Equipment — Heavy trucks, electric gong, electric lights and tools. Light models, electric bell, electric lights, storm front and side curtains, and tools.

WALKER.

Walker Vehicle Co., Chicago.

Models—Five chassis models; capacity, 1,000 pounds, 1 ton, 2 tons, 2½ tons, and 3½ tons. Wheelbase, tires, battery equipment and other details to suit requirements of service. Single motor drive; motor enclosed in rear axle and driving to internal gears in rear wheels through balanced system of gears.

Selling Points—Balanced drive which is extremely efficient, because side thrust and friction are practically eliminated; all working parts enclosed, the motor in the axle and the gearing in the wheels, which are oil-tight and dustproof; high mileage capacity because of high efficiency of drive; accessibility of motor and gearing; ball-bearing hollow armature shaft; adaptability of the machine to all classes of service.



WAVERLEY REAR CONSTRUCTION, SHOWING MOTOR SUSPENSION

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Engine Starting and Lighting Devices

To those who last year viewed the shows with a discerning eye, the great development which is apparent in electric lighting and engine starting systems very likely will be considerably less of a surprise than it will be to others who were inclined to discount plainly apparent tendencies on the theory that enthusiasm for the then relatively new equipment of the kind was running just a little bit too high to be perfectly healthy. And yet the past year has seen no little backsliding in the ranks of the manufacturers of acetylene and air and mechanical starters, and the advances that have been made by the manufacturers of electrical equipment are out of all proportion to the retrogression of the others.

It is needless to point out that everything next year will be electric lighting and starting—apparently there will be little place for other equipment designed to perform the manifold functions of the electrical apparatus. Notable advances have been made, of course, in the production of electric lighting apparatus alone—several new systems, among which are the Bijur and the Disco, have been developed within the year—though the most notable feature is the greatly increased number of electric engine starting systems which have been brought out.

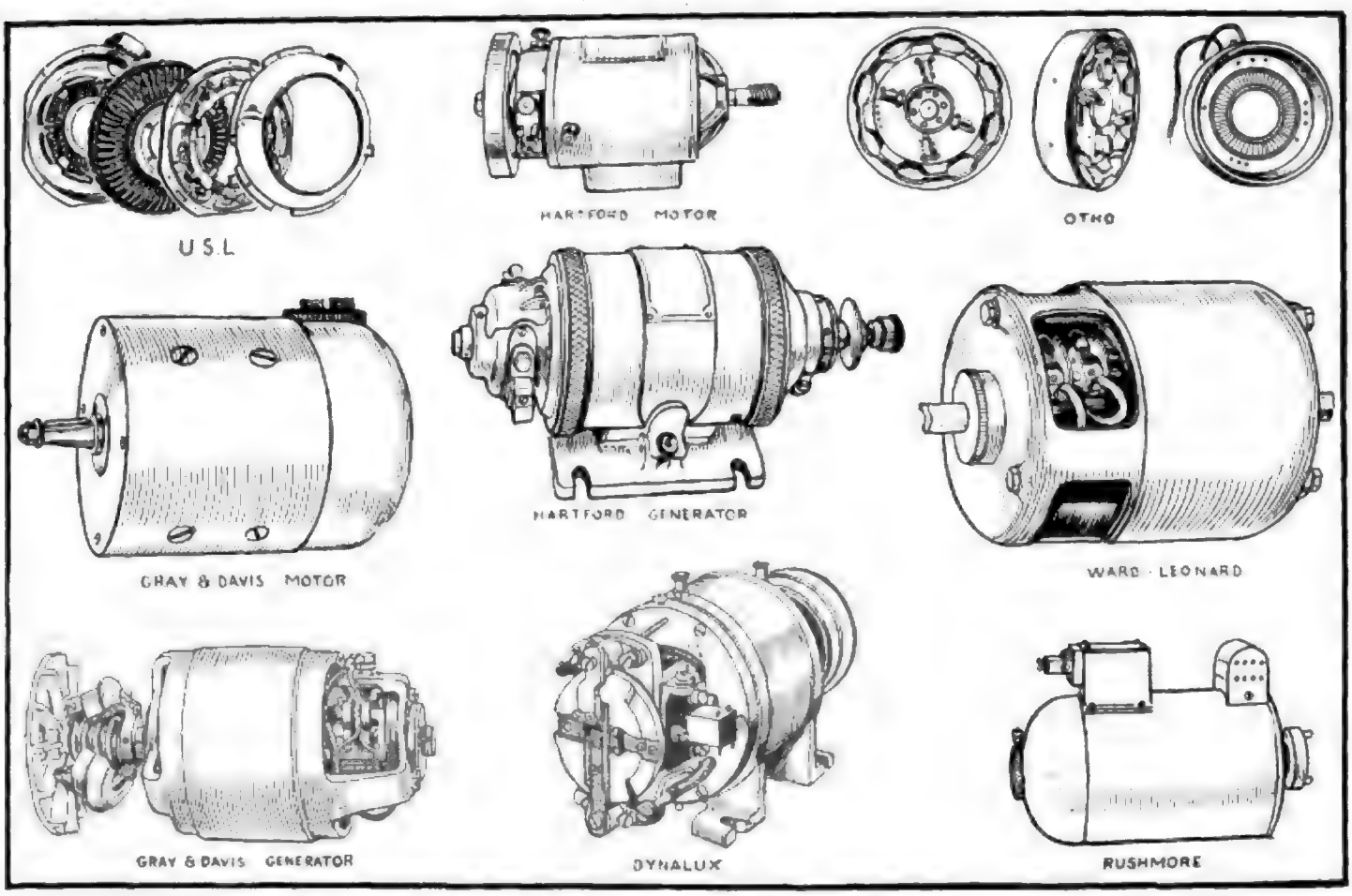
In several instances these new systems are of the combined electric lighting and engine starting type and are new throughout, such, for instance, as the Otho and the Bijur, the Elyria-Dean and the Disco, though in an equally great number of cases, the addition of electric starting equipment to an already well established line of lighting apparatus marks the advance which has been made.

Prominent among the new electric engine starting systems that have been developed within the year and added to electric lighting equipment long since well known, is the Gray & Davis, the Esterline, the Auto-Liter, the Rushmore, the Remy and the Ward Leonard. All of these systems are of the two-unit type with the motor and the generator separate, though in at least one case, that of the Remy Electric Co., a new system of both single and two unit types has been added.

Coincident with the development of electric lighting systems there has come also a stimulation of the production of electric

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lamps and a general refinement of designs which is having no particular difficulty in keeping step with the demand for lamps that are exclusively electric in appearance as well as in construction. The most notable tendency is toward water and dirt proof construction, the end being attained in a variety of ways; nickel plate finish apparently is increasing in popularity.



SEVEN OF THE COMBINED ELECTRIC LIGHTING AND ENGINE STARTING SYSTEMS

AUTO-LITER.

Electric Auto-Liter Co., Toledo, O.

Models—Two models, one a plain electric lighting generator and the other a lighting and starting system of the two-unit type in which generator and motor are separate.

Features—The generator is of the permanent magnet type, regulation being effected by governing the speed of the armature, a centrifugally operated friction clutch being employed for the purpose; the cut-out is of the electro-magnet type and is contained in a housing within the arch of the magnets. In the lighting and starting system, the motor is of the series wound type.

BRIGGS.

Briggs Magneto Co., Elkhart, Ind.

Models—Three models, one each combined lighting and ignition, combined lighting and starting and combined lighting, starting and ignition.

ADLAKE.

Adams & Westlake Co., Chicago, Ill.

Models—One model electric lighting system, consisting of dynamo, regulator, fuses, switches, etc.

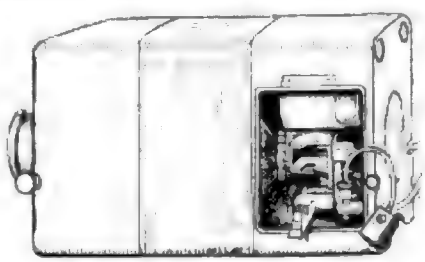
Features—Dynamo is a compact shunt wound machine in which current regulation is obtained by a combined electric and mechanically operated rheostat which inserts resistance in the field to maintain the current output constant.

BIJUR.

Bijur Motor Lighting Co., New York City.

Models—One model combined electric lighting and engine starting system in which the motor and the generator are separate units.

Features—Dynamo is of the shunt wound type with automatically controlled current



BIJUR GENERATOR UNIT

by means of a vibrator contained within the casing, the purpose of which is to maintain the current strength constant by momentarily inserting resistance in the field. Both current controller and automatic cut-out are of the electro-magnetic type; dynamo may be driven from any convenient rotating shaft and is provided with integral gearing to ensure proper speed. Motor is of the plain series wound type and is connected to the gasolene engine through gearing cut in the periphery of the flywheel. The system is new throughout.

ELYRIA-DEAN, OTHO, DYNALUX.

Dean Electric Co., Elyria, O.

Models—Two models of combined electric lighting and engine starting systems and one electric lighting system.

Features—In the Dynalux system, which is for lighting only, the output of the generator is maintained practically constant by governing the speed of the armature; up to certain speeds the armature is positively driven; when the speed becomes excessive the connection between the engine and the generator automatically is broken

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temporarily until the speed is reduced. The cut-out is of the centrifugal type. In the Delco system, which is for combined lighting and starting, the principal unit takes the place of the ordinary flywheel and serves both as generator and motor; it is distinctive in that there is no rotating wiring, the brushes and the pole pieces being the only rotating parts. Regulation is effected through the medium of an outside device which automatically inserts resistance in the field as the current strength builds up. In the Elyria-Dean lighting and starting system the generator and the motor are separate units, the former being driven at crankshaft speed, preferably from the pump or magneto shaft, and the latter driving the gasolene engine through the intermediary of gearing on the flywheel or the crankshaft. The motor is of the series type and is supplied in two sizes (both operating on six volts), for motors up to 30 horsepower and for larger motors. Regulation of the generator is obtained by differential winding and the cut-out is contained within the generator casing.

DEACO.

Detroit Electric Appliance Co., Detroit, Mich.

Models—Two models, one a combined high-tension magneto and electric lighting generator and the other a plain lighting generator.

Features—The generator is of the combined permanent magneto and electric-magnet type, regulation being effected by "bucking" one field against the other, for which purpose electro-magnets contained in a housing within the arch of the magnets are employed; the cut-out is of the electro-magnet type. The combined generator and high tension magneto is essentially the same as the generator except that it is fitted with a distributer and the usual timer, contact breaker and condenser.

HARTFORD.

Hartford Suspension Co., Jersey City, N. J.

Models—Two models, both two unit combined lighting and engine starting systems, one of which is to be built in place and the other may be attached to any existing car with slight material mechanical alterations.

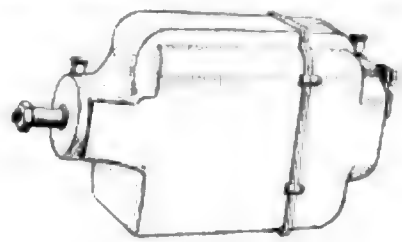
Features—The dynamo is the same for both systems and is of the constant speed type, a centrifugally governed friction clutch being employed. The motor also is the same for both systems, though the method of attachment differs. In either, the motor is connected to the gasolene engine through the intermediary of a double reduction combined spur and worm gearing, the ratio being approximately 125 to 1. In the Hartford system, the motor is connected to the engine either through gearing on the periphery of the flywheel or to the crankshaft; in the other and new system the starting motor is attached to the chassis frame and drives the gasolene motor through the same type gearing attached directly to the crank spindle. Both systems operate on six volts. Both motors are equipped with miniature flywheels, which assist in maintaining their speed (which is about 7,000 revolutions a minute) during the moments when the pistons pass compression dead center.

DISCO.

Ignition Starter Co., Detroit, Mich.

Models—Two models, one an acetylene engine starter and the other an electric lighting and engine starting system in which the generator and motor are separate units.

Features—Disco gas starter consists essentially of a rotary distributer valve to be mounted on the dash, suitable piping and check valve petcocks for insertion in the engine cylinders. The distributing valve has



DISCO DYNAMO

been improved to make it more positive and the engine valves now serve as priming cups as well, and are so constructed that they are self-cleaning. The electric system is of the two-unit type in which the motor and the generator are separate, though they are identical in external appearance. They are exceptionally narrow to facilitate easy mounting in places where space is restricted; regulation is an inherent function of the dynamo. The motor is of the series type and is designed to operate on 12 volts, at which pressure it is calculated to "spin" heavy motors at the rate of 150 revolutions a minute.

ESTERLINE.

Esterline Co., Lafayette, Ind.

Models—One model combined electric lighting and engine starting system in which the generator and the motor are separate units.

Features—The starting portion of the system is new. The generator is of the combined permanent magnet and electro-magnet type and regulation is effected by balancing the effect of one against the other. Three sizes of generators are made, running at 1½, 2 and 2½ times crankshaft speed; 10 seconds running of the generator after normal starts is sufficient to replenish the battery to its original state of charge. The starting motor is geared to the gasolene engine through double herringbone gears of the Weiss type, which will operate dry without noise. The system operates on six volts.

GRAY & DAVIS.

Gray & Davis, Boston, Mass.

Models—Two models combined electric lighting and engine starting system, both of the two-unit type, in which the motor and generator are separate.

Features—Both systems operate at six volts pressure; in both, dynamo regulation is obtained by governing the speed of the armature, the method embracing a centrifugally operated friction clutch; as the generator is of the shunt wound type, the output automatically is regulated according to the load. The motor is of the series wound type in which the torque increases with the load and operates on the nominal pressure of six volts. The cut-out is of the electro-magnetic type. The starting motor is geared to the gasolene motor through the intermediary of gearing cut in the periphery of the flywheel.

MOTSINGER.

Motsinger Device Mfg. Co., Lafayette, Ind.

Models—One model low tension electric lighting generator and sundry coils, switches, ignition apparatus and electric bulbs.

Features—The generator is of the plain, low tension, shunt wound type and is driven by friction from the rim of the flywheel. Current regulation is effected by governing the speed of the armature, the clutch being operated centrifugally. The generator may be employed either in conjunction with a storage battery or it may be used for the lights directly, regulation being sufficiently positive to ensure against the lamps either flickering, or burning out at excessive engine speeds. The Motsinger charging board is a simple device combining a meter and a switch for connecting and disconnecting the dynamo and the storage battery.

NORTH EAST.

North East Electric Co., Rochester, N. Y.

Models—One model combined electric lighting and engine starting system of the single unit type in which the motor and generator are combined.

Features—The principal unit serves alternately as generator and motor and is geared to the engine through spur gearing which automatically is altered by magnets to give the proper ratios for starting and for charging. The motor-generator is driven and drives through the intermediary of a "silent" chain to the crankshaft.

REMY.

Remy Electric Co., Anderson, Ind.

Models—Four models, one plain lighting system, one combined lighting and ignition system and two combined lighting and engine starting systems, one of the two-unit

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and one of the single unit type with combined generator and motor.

Features—The lighting dynamo is designed to carry a heavy lighting load at low speed and to operate without the necessity for gearing. Regulation is an inherent characteristic of the machine and requires no outside mechanical or electrical devices; the combined lighting and ignition system consists of the same generator equipped with a contact breaker and distributor; a separate coil is used to transform the low tension current. In the two-unit type lighting and starting system the same generator is employed, the separate motor being geared to the engine in a suitable manner. In the single unit system the motor and generator are combined in a single machine which is geared to the gasolene engine through the intermediary of a "silent" chain. The dynamo portion of the unit is self-regulating and entirely automatic. Two sizes are supplied for engines of different powers and each size is made in both round and rectangular shapes to facilitate mounting.

SPLITDORF.

Splitdorf Electrical Co., Newark, N. J.

Models—One model electric lighting system consisting of generator, fuse box and ammeter.

Features—The generator is of the combined permanent magnet and electro-magnet type in which current control is obtained electrically by means of differential windings contained in a housing within the arch of the magnets. The cut-out is of the electro-magnet type; the battery is "floated on the line."

RUSHMORE.

Rushmore Dynamo Works, Plainfield, N. J.

Models—Two models, one a plain electric lighting system and the other a combined electric lighting and engine starting system in which motor and generator are separate units.

Features—The Rushmore generator is of the shunt wound type in which output regulation is governed by a "bucking" coil, the insertion of which in the field, in turn, is governed by the temperature, and therefore the resistance of a small coil of iron wire contained in a housing on the top of the generator. In the combined lighting and starting system the motor is separate and is geared to the gasolene engine through the flywheel. Its gears are automatically thrown in and out of engagement by the depression of a button.

U. S. L.

United States Light & Heating Co., Niagara Falls, N. Y.

Models—One model single unit combined electric lighting and engine starting system.

Features—The single unit is a combined generator and motor and is designed to take the place of the ordinary flywheel, making the latter unnecessary. The unit, therefore, is direct connected, thus eliminating any and all forms of gearing. Current regulation is obtained by varying the pressure on a carbon pile. U.S.L. storage batteries (formerly National) for ignition, lighting and starting and commercial vehicle work also are produced in a variety of sizes and types.

WARD LEONARD.

Ward Leonard Electric Co., Bronxville, N. Y.

Models—Two models, one a plain lighting system and the other a combined electric lighting and engine starting system.

Features—The Ward Leonard dynamo is a plain shunt wound machine in which current regulation is effected by momentarily inserting a single step of resistance in the field when the current passing through it becomes 10 amperes; immediately the current drops to 9.9 amperes the resistance is removed and the current strength becomes greater again causing the resistance to be inserted. The fluctuations are so rapid, however, as to cause no appreciable flickering in the lamps. The starting motor is a plain series wound machine. The remainder of the system consists of a simple combined rotary switch and junction box.

WESTINGHOUSE.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Models—One combined electric lighting and ignition system, an electric vulcanizer, a mercury arc rectifier and a mechanical or vibrating alternating current rectifier.

Features—The combined lighting and ignition generator is distinctive in that it employs a centrifugal cut-out switch and a new type of ignition contact breaker in which two contacts are employed. The electric vulcanizer is of the orthodox pattern, as is the mercury arc rectifier. The mechanical rectifier is designed for use in charging three-cell storage batteries, such as are used for ignition and starting. It consists essentially of a polarizing relay acted upon by two alternating current magnets in such a way that it vibrates in synchronism with the alternations in the current and therefore reverses the direction of the current reverses so that pulsating direct current is obtained at the terminals.

WARNER.

Warner Gear Co., Munice, Ind.

Models—One model spring engine starter constructed under the Gardner patents.

Features—The starter consists essentially of a heavy steel spring assembled in the clutch housing and operated with clutch pedal and gear shift lever.

Tires and Appurtenances

Non-skids, non-skids and still more non-skids, best represents the development of the year so far as tires are concerned. With practically no room left for the improvement of the tires themselves, it has appeared as if the factory wise men almost have lain awake nights in their endeavor to evolve something useful or ornamental, or both, in the way of non-skid treads; they have become almost epidemic.

No line is complete without at least one, and so far as the tire exhibits at the shows are concerned, nine-tenths of the novelty will be contained in the varying designs of non-skid treads, unless the Pennsylvania oilproof tire and the Diamond and Goodrich cord tires be excepted; and, as a matter of fact, the Diamond cord tire was privately displayed at last year's show. All that has been said, of course, applies to pneumatics; for the development of special cushion tires, or special solid tires for electric pleasure cars, has been sufficiently plain at least to justify remark.

In the matter of inner tubes, there seems to be a distinct inclination toward the use of red rubber. The only new thing in the line of tubes, however—and that is not wholly new—is the Brown non-deflating tube. There have been several "self-vulcanizing" patches evolved but the most novel "healing" medium probably is the Goodrich inner tube plug, which will be presented for the first time. It makes use of the puncture-closing principle employed with single tube bicycle tires.

FISK TIRES.

Fisk Rubber Co., Chicopee Falls, Mass.

Types—Fisk Clincher, Fisk Q. D., Fisk Bolted-On and Fisk Dunlop, with plain, Bailey or Town Car treads. Para inner tubes.

Features—The Bolted-On tire is the distinguishing member of the Fisk line, it being so constructed that unless the bolts which hold the retaining flange are removed the tire cannot come off the rim, thus affording a factor of safety. At the same time, ease of removal and replacement is claimed. The Town Car tread is shown new. It consists of three rows of buttons, the two outer rows being set upon a raised surface which leave a wearing surface even after the buttons are worn away.

The Fisk Clincher is designed to fit a one-piece clincher rim. The Fisk Q. D. is made for use on a quick-detachable rim with removable side flanges; this type differs from the clincher in that it has a stiffer

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"SAFETY" TREAD UTILIZED BY GOODRICH AND DIAMOND COMPANIES

...ed which is of the non-expanding ...

...inner tubes are made of six plies of pure ... a construction designed to prevent ... places in the tubing.

GOODYEAR TIRES.

Goodyear Tire & Rubber Co., Akron, O.

Types—Straight-side, with plain or non-... Solid truck tires.

Features—Ten per cent over-size and the ... features mark this line. The ... in building each tire one-... than the ordinary size, so that ... more air and durabil-... Cut feature rests in the ... tires with straight sides and ... quick-detachable flanges ... that the hook of the flange ... the base of the tire. When ... side bends over the round-... not cut by the edge of the ... tread is made up of ... to afford trac-... ability and at the ... unbroken support to the ... made by double-cure ...

GOODRICH TIRES.

B. F. Goodrich Co., Akron, O.

Types—...ber Q. D. and straight-side ... metal-studded or Bailey tread. ... Pneumatic, wireless, and block ... Special electric tires.

Features—Safety straight-bar tread and ... qualities. Cord tires, cord re-... the fabric of ordinary construction ... are demountable or pressed on ... method of application only; the ... is especially designed for this-class of service. A new development is a Permanent Puncture Plug, which looks and is inserted like a collar button, instantly and permanently closing punctures. Another new production is the Self-vulcanizing Patch, which consists of a dollar-shaped gray patch, of which one side is cured and the other uncured. It is applied by pressing the uncured side to the gasolene-cleaned surface of the tube, after which the tube is inserted and inflated, the heat of the tire completing the vulcanizing of the patch to the tube. Price, $1 a dozen.

EMPIRE TIRES.

Empire Tire Co., Trenton, N. J.

Types—Red and Gray, Clincher, Q. D. and Straight-side, with plain or non-skid tread.

Features—The distinguishing feature of the Empire line is a new red rubber non-skid tire with a new non-skid tread; the red rubber, it is claimed, gives greater resiliency, heats less quickly and wears better than a gray tire and is distinctive in appearance; the tread is made up of four grooves running circumferentially around the tire and cut at intervals by diagonal grooves. Peerless red, extra heavy inner tubes are of heavier build than the Standard Empire tube. Besides the new red tire, there is the regular line of gray tires with the new non-skid tread.

DIAMOND TIRES.

Diamond Rubber Co., Akron, O.

Types—Clincher, Q. D. and Fisk Heavy Car Bolted-On, with smooth, studded, Bailey or Squegee treads; Silvertown cord tires. Solid tires; inner tubes.

Features—Safety tread and Silvertown cord tires; the former consists of successive series of five finger-like projections each, lying side by side and joined at their centers by a narrow strip of rubber. The name is derived from the likeness of the tread's action to that of a Squegee street cleaner. The Silvertown cord tire is made up of two layers of overlying cords which are fastened to wire hooks embedded in the head. Between each layer of cords is a layer of rubber. Lightness, resiliency and lively action of a car are claimed for this type. The other Diamond types are in plain, studded or Bailey tread. The Bolted-On is similar to the Fisk of that design, after which it is named. Several sizes and types of truck tire are presented.

FIRESTONE TIRES.

Firestone Tire & Rubber Co., Akron, O.

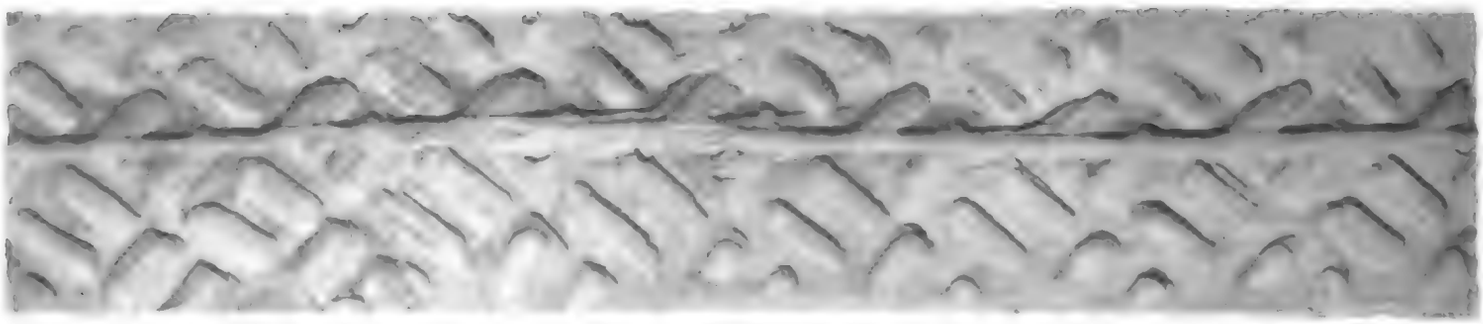
Types—Clincher, Q. D. Clincher and Q. D. Straight Side, with plain or "Non-Skid" treads. Special Electric (Pleasure); for trucks, Continuous Base Notched Tread, Hard Base Channel, Hard Base European, Heavy Duty and Clincher Cushion. Red inner tubes.

Features—Red inner tube of high quality rubber is new. Line is distinguished by tread made up of the words "Non-Skid." This and the plain tread comprise the Firestone tire surfaces. Firestone cushion tires for electric pleasure cars have double tread and internal cavities. Firestone notched tread tires are on a continuous base, the latter feature being designed to eliminate side abrasion from metal retaining plates, such as are used in block tires. Hard Base Channel type tires consist of a tough tread united with a hard base and the whole vulcanized into a channel with saw-tooth base. The European type is similar to the Hard



"CHAIN" TREAD NON-SKID EMPLOYED BY UNITED STATES TIRE CO.

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NON-SKID TREAD DESIGN UTILIZED BY THE SHAWMUT COMPANY

Base Channel kind, but is vulcanized to a flat sub-base with dovetailing projections on the surface. The Heavy Duty tire is made strong by cross and side wires at the base. Firestone Cushion tires have either clincher or straight sides and have a dual, round, plain tread. The Special Electric is solid, with side and cross wires at the base.

UNITED STATES TIRE CO.

United States Tire Co., New York City.

Types—Clincher, Q. D. and straight-side with Nobby, Chain or plain tread. Block and solid, single or dual, demountable truck tires.

Features—Following the combination of United States, G. & J., Morgan & Wright, Hartford and Continental tires in the United States Tire Co., all except the first two brands have been dropped from the list, and with them go the treads which served to distinguish them. The two United States types, Nobby and Chain treads, are featured now, while the G. & J. is retained as a special dealers' tire. The best constructional features in the discontinued tires have been incorporated into the brands retained. An extra large Nobby tread, 38 x 8, is built for truck use. To the line is added this year a block truck tire designed to meet standard S. A. E. wheel specifications. Special tires for electric vehicles also are produced.

REPUBLIC TIRES.

Republic Rubber Co., Youngstown, O.

Types—Clincher and Q. D. pneumatics, plain or Staggard tread; electric pneumatic, with Staggard tread; European type truck tire, single or dual. Black-line red inner tubes.

Features—Staggard tread, which consists of several circumferentially running rows of finger-like projections upon the tread, so set that the space between two projections comes opposite the center of another, thus affording gripping and non-skidding ability. The Staggard feature is continued in solid and pneumatic electric car types, wherein the projections are larger and not so numerous. In the heavy truck type the Republic company has brought out a new European type with rounded tread and the base of the rubber set upon a corrugated metal base with dovetailing projections. Black-line red rubber inner tubes are marked with a narrow black line which extends spirally about the tube.

KELLY-SPRINGFIELD TIRES.

Kelly-Springfield Tire Co., Akron, O.

Types—Pneumatic tires with smooth, Bailey or Kant-Slip treads; Sectional or Block, Endless, and Side Wire, solid truck tires; Kelly pure gum inner tubes.

Features—Kant-Slip tread is a new design; it consists of a bead running around the tire's greatest circumference with small raised crosses at each side and at close intervals, affording gripping power. Other pneumatic types in plain and Bailey treads, and for Clincher or Q. D. rims.

The Kelly block or sectional tire is a feature of the truck line; it consists of a number of rubber blocks attached to the rim in close proximity, in a single or in a double row. Ease of renewal when a section gives out and greater length of life through the absence of creeping or "bunching" are advantages claimed.

Endless is a new truck tire; it has within the body and close to the wheel band several canvas-covered wires which cause the tire to hug the wheel and are intentioned to prevent creeping. Bolted flanges at each side prevent side movement.

The Side Wire differs slightly from the Endless. This has wires which pass across through the tire's base and are borne down upon by circumferential wires at the sides, but within the rubber.

WALPOLE TIRES.

Walpole Rubber Co., Walpole, Mass.

Types—Clincher and Q. D.

Features—Guarantee against stone bruise and defective workmanship during 4,000 miles of travel. The construction which is the basis for the stone bruise guarantee consists of placing a gum breaker strip or cushion between the fabric and the tread, ⅛ inch thick at the tread and tapering to 3/32 inch at the bead; also the tread is heavy, being especially strong at the tire sides, and measures ⅛ inch at the bead. The use of pure Para rubber with this method of building is claimed to give to the tire sufficient resiliency and stretching ability or pliability to enable it always to remain in contact with the fabric under blows from stones.

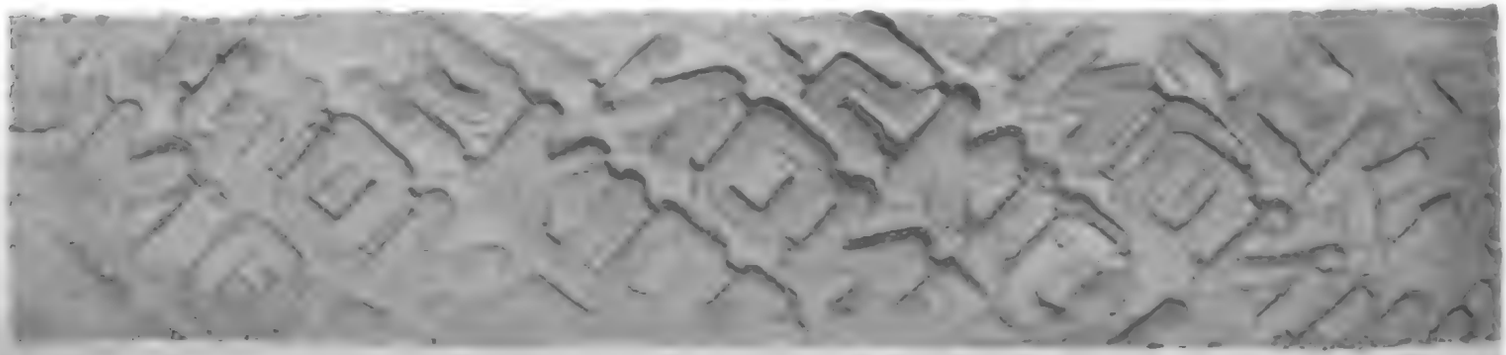
SWINEHART TIRES.

Swinehart Tire & Rubber Co., Akron, O.

Types—Pneumatic — Keaton Depression non-skid or plain tread clincher and Q. D. Solid—Flanged, Clincher, Cellular and Special Electric Cellular truck tires.

Features—Keaton Depression tread for pneumatic tires and the electric cellular tire are new.

Keaton Depressions are symmetrical, kite-shaped depressions in the tread with a



LETTERED NON-SKID TREAD USED BY FIRESTONE TIRE AND RUBBER CO.

straight-line cut across the shorter diagonal. The claim is made for this construction that chains are unnecessary.

The electric cellular tire consists of a series of tread-deep quarter-inch holes in the solid tire, molded at an angle to the surface of the tread so that suctional gripping power is available as the tread is forced down upon the roadbed. This is similar to the larger and heavier cellular truck tire in which the depressions are considerably larger. Economy of current is claimed for both.

OILPROOF VACUUM CUP TIRES.

Pennsylvania Rubber Co., Jeannette, Pa.

Types—Clincher and Q. D., with Oilproof vacuum cup or smooth treads. Demountable truck tires, with vacuum cup tread.

Features—Originators of the vacuum cup tire, the Pennsylvania company also developed the method of oilproofing tires. It [illegible] a composition of rubber and [illegible] materials made by a secret process, [illegible] colors the rubber slightly red and is [illegible] make it impervious to the action [illegible] tread is combined with the [illegible] cup design wherein small, round [illegible] are placed upon the tread and are [illegible] to afford unusual gripping and non-[illegible] qualities. Besides these there is a [illegible] tread tire. Truck tires dual and sin[illegible] are made with the vacuum cups. In the [illegible] the demountability is a feature, a [illegible] wedge ring permitting both [illegible] to be removed from the same side of [illegible]. The truck tires are guaranteed [illegible] miles under specified conditions [illegible] the pneumatic vacuum cup tire for [illegible].

LEE AND LEELAND TIRES.

Lee Tire & Rubber Co., Conshohocken, Pa.

Types—Clincher, Q. D. and straight-side, with plain or Zig-Zag tread; also puncture-proof.

Features—Lee tires are made by a one-piece wrapped tread process, the object being to reduce the danger of "pinching" and overcurving, the Zig-Zag tread is a distinguishing design and consists of circumferential lines of protruding rubber projections [illegible] by zig-zagging cross projections. The puncture-proof construction consists of several layers of small, round metal disks embedded in the tread and which overlap but do not touch, being separated by rubber. They are designed to prevent an entering object from puncturing the tread. These types are guaranteed for 3,500 miles. Leeland tires have not the metal disks and are marketed without a warranty. Inner tubes are of red Para rubber.

RACINE TIRES.

Racine Rubber Co., Racine, Wis.

Types—Quick detachable and Dunlop, with plain or non-skid treads, including Trusty tread.

Features—Trusty tread is new; it consists of three rows of elongated rubber studs, the center row being aligned with the circumference of the tire and the two outer rows being set irregularly and so that the breaks between studs in the inner and outer rows do not come opposite each other. Tractional and non-skidding qualities are claimed for this construction, with a continual road bearing surface. Other members of the Racine line have plain and non-skid treads, as used in previous years.

AJAX TIRES.

Ajax-Grieb Rubber Co., Trenton, N. J.

Types—Clincher and Q. D.

Features — Five-thousand-mile guarantee, which is claimed to be 1,500 miles greater than the guarantees given with other tires. Thick treads and wearing ability are strong selling points. Great road gripping power is claimed for the non-skid tread, which consists of crossed cuts in the rubber; the other Ajax-Grieb type has a plain tread.

PORTAGE TIRES.

Portage Rubber Co., Barberton, O.

Types—Clincher and extra heavy truck and limousine tires, with plain or Daisy non-skid treads. Pure gum tubes. Tube protecting flaps.

Features—The heavy pneumatic tire for light truck or limousine use is the distinctive part of the Portage product; it is built in 4 and 5-inch sizes, the former having 8 plies of Sea Island rubber and the latter 10, which is claimed to be from 2 to 4 more than in the average pneumatic tire. Durability and not speed is claimed for this type. In addition there are the lighter Clinchers. Portage tubes are sold in individual sealed boxes, assuring delivery in the same condition as when the tube leaves the factory. The Portage Loose Flap is a protector which fits between the rim and the tube and prevents pinching and other damage.

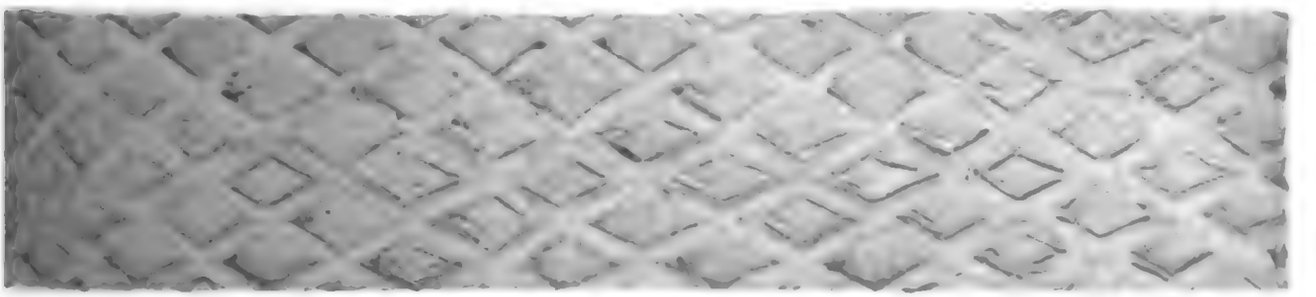
SEAMLESS TIRES.

Seamless Rubber Co., New Haven, Conn.

Types—Clincher and Q. D., with plain, Safety or Nutty tread. Red and gray Seamless inner tubes.

Features—Nutty tread is new; it is offered with straight-side or clincher tires and consists of a collection of studs of hexagonal nut shape so grouped that vacuum depressions are formed as the studs are compressed in travel. Straight-side tire also is new; it is supplied either in the old or the new tread. The Seamless Safety tread of former years consists of a series of cuts or depressions at each side of the center of the tread, in appearance much like a scaling ladder.

Seamless tubes are featured as being built without a seam and are of red and gray rubber.



NON-SKID TREAD EMPLOYED BY THE GOODYEAR TIRE & RUBBER CO.

FEDERAL TIRES.

Federal Rubber Mfg. Co., Milwaukee, Wis.

Types—Clincher, Q. D. Clincher and Straight-Wall Detachable, with plain or Rugged tread.

Features—The Rugged tread is the chief features which distinguishes the Federal product; it consists of three rows of strong studs set equidistant upon the carcass of the tire. Excellent road-gripping ability is claimed.

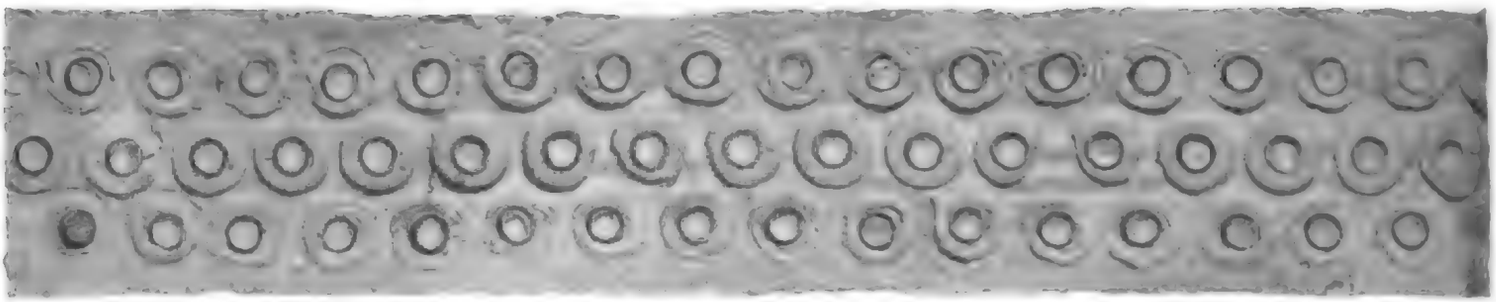
TYRIAN TIRES.

Tyer Rubber Co., Andover, Mass.

Types—Clincher, Q. D. and straight-side with Hold-Tite and anti-skid or plain treads. Inner tubes.

Features—The maker, who is new in the tire field, has for many years been engaged in the manufacture of other rubber goods of high quality, and claims the same quality for its tire. The Hold-Tite tread

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"VACUUM CUP" TREAD UTILIZED BY PENNSYLVANIA RUBBER COMPANY

consists of a row of T-shaped depressions, the heads of the T's abutting on an uncut section which extends circumferentially about the casing. Gripping and vacuum qualities are claimed.

CARSPRING TIRES.

New Jersey Car Spring & Rubber Co., Jersey City, N. J.

Types—Clincher and Q. D., with plain or Clingtite tread.

Features—Clingtite tread is a depression instead of a projection construction, having variously formed gripping cavities; the depressions are cup-shaped with protruding centers at the middle of the tread, while at the sides they are semi-circular. The cups with raised bottoms are designed to form a vacuum as the rubber is pressed against the roadbed, and the claim is that, as the pressure is released, the convex bottom automatically breaks the vacuum and releases the grip in time to prevent the tire being held to the road as it tends to revolve.

BRAENDER TIRES.

Braender Rubber & Tire Co., Rutherford, N. J.

Non-skid type with special built-up tread. Braender red inner tubes.

Features—The Braender tire is distinguished from others by its Bull Dog tread, which is of peculiar design. Upon the carcass are built up bars of rubber which run diagonally across the tread and are claimed to afford non-skidding ability of a high degree and also strong tractional power, in that the bars clutch the roadbed and the spaces between form a vacuum, which holds the tire to the road. Braender red inner tubes are of Para rubber and have a three-ply reinforcement about the valve bases; the process of manufacture is such that freedom from bloom is claimed.

MOTZ TIRES.

Motz Tire & Rubber Co., Akron, O.

Types—Cushion and Solid, with smooth and non-skid treads, for pleasure or commercial cars.

Features—Undercut sides and slantwise bridges are distinguishing marks in Motz tire construction; undercutting of the sides and the leaving of a slantwise bridge between cuts is claimed to give greater resiliency than would be the case were the sides of the tires left solid. The treads also are cut for the purpose of affording anti-skidding ability. The various types are fitted for use on clincher, Q. D., or demountable rims.

THERMOID AND NASSAU TIRES.

Thermoid Rubber Co., Trenton, N. J.

Types—Clincher and Dunlop, with plain tread. Merit red inner tubes.

Features—The Thermoid De Luxe is the Thermoid leader and is guaranteed for 4,000 miles; it is furnished for any standard type of rim and comes only in plain tread. The Nassau tire carries a 3,500-mile guarantee. The company's red tubes bear the trade name of Merit.

PROWODNIK TYRES.

Russian Tyre Sales Co., New York.

Types—Clincher and Q. D., with Pat. steel-studded or Columb "tough tread" non-skid treads.

Features—"Tough tread," just introduced, consists of a section of tough black rubber at the wearing point of the tire. India rubber, giving a pliable and enduring construction. Impregnated fabric. High quality as compared with cost, due to low price of labor in Russia.

MARATHON TIRES.

Marathon Tire & Rubber Co., Cuyahoga Falls, Ohio.

Types—Clincher and Q. D. Inner tubes.

Features—The entire Marathon line is new, the company being a late entry into the tire field. Its line is marked by the Angle tread, which is designed for non-skidding purposes; plain treads also are furnished. The company's inner tube is of red rubber, for which so much is claimed by tire makers as an inner tube material.

MILLER TIRES.

Miller Rubber Co., Akron, O.

Types—Clincher and Q. D.

Features—A new tread has been developed; it consists of angle-shaped depressions arranged in two rows, one on each side of the center of the tread. Manufacture is by the one-cure wrapped tread process, which it is claimed gives an enduring tread.

CONTINENTAL-ERIE TIRES

Continental Rubber Works, Erie, Pa.

Types—Clincher, Q. D. and Straight-side, with plain or non-skid tread.

Features—Quality of construction and wearing ability; tires are marketed under the trade names Continental-Erie, Liberty and Tribune.

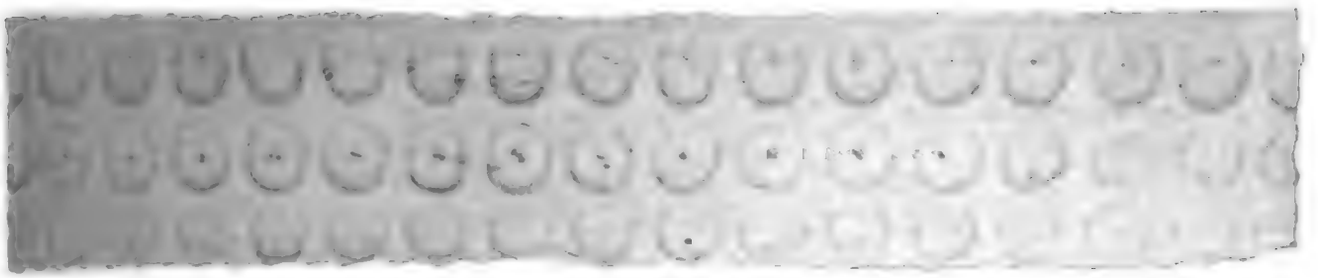
POLACK TRUCK TYRES.

Polack Tyre Co., Bridgeport, Conn.

Types—Solid, single or dual, with American or European profiles.



NON-SKID TREAD DESIGN ADOPTED BY REPUBLIC RUBBER COMPANY



NON-SKID TIRE TREAD EMPLOYED BY FEDERAL RUBBER COMPANY

Features—From 27 to 72.8 per cent. more rubber in Polack tyres than in the average clincher or flat-tread tire is claimed by the the Polack makers. Tires have a rounded tread which, in the European profile, varies with the width of the tire, whereas the American profile does not increase in depth proportionately as the width is increased. Quantity and quality of rubber claimed to give exceptional resiliency and endurance. Guarantee is 8,000 miles, to be made within [illegible]

ENGLEBERT TIRES.

Englebert Tire Co., New York City.

Types—Clincher and Q. D., with flat, [illegible] non-skid or leather steel-studded tread.

Features—The flat tread, which, of course, presents a flat surface to the road. The [illegible] steel-studded tread is a part of the tire itself and is claimed to be an excellent preventive of skidding, as is the Chevron. Tires are made in Belgium.

GLOBE TIRES.

United States Rubber Mfg. Cos., Trenton, N. J.

Types—Clincher and Q. D. Inner tubes.

Features—Quality and a new red inner tube which is claimed a tensile strength of [illegible] pounds to the square inch; the tube is guaranteed against deterioration for one year from date of shipment from the factory.

BATAVIA TIRES.

Batavia Rubber Co., Batavia, N. Y.

Types—Clincher and Q. D., with plain or [illegible] Inner tubes.

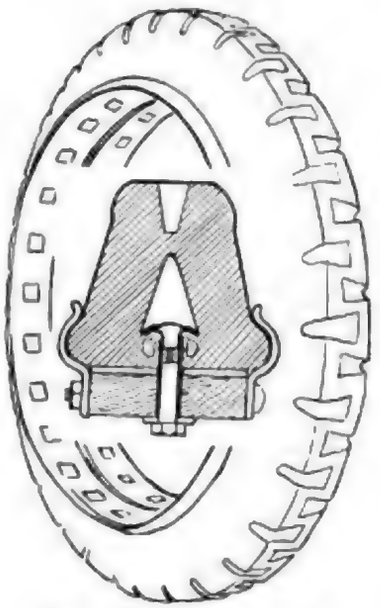
Features—The Security non-skid tread, which has been in service for five years. Inner tubes and a method of protecting them from punctures are other features.

OVERMAN CUSHION TIRES.

Overman Tire Co., 250 West 54th street, New York City.

Types—Pleasure and commercial.

Features—Tire is retained at the head by flanges and has in the center near the base a triangular cavity which permits a flow of rubber inwardly under pressure. The tread is cut with alternate wedge-shaped depressions at the sides which is claimed to afford non-skidding ability and also room for the flow of rubber. The tire requires a special rim carrying square locking nuts which fit into depressions in the tire base. The tire is locked to the rim by bolts which pass through the felloe and band and screw into small plates in the tire base. Resiliency is claimed to compare favorably with pneumatic tire.



OVERMAN CUSHION TIRE

FAVARY CUSHION TIRE.

Favary Tire & Cushion Co., New York City.

Type—Support and band, for all standard rims, both pleasure and commercial.

Features—Tire is new; it is made up of bands of fabric spaced apart by small supports which are so placed that a support rests upon the fabric midway between two other supports this is designed to take up the road shock. Fabric is used in the pleasure car types only; in the truck tires the bands are chains.

INTERLOCK INNER TIRES.

Double-Fabric Tire Co., Auburn, Ind.

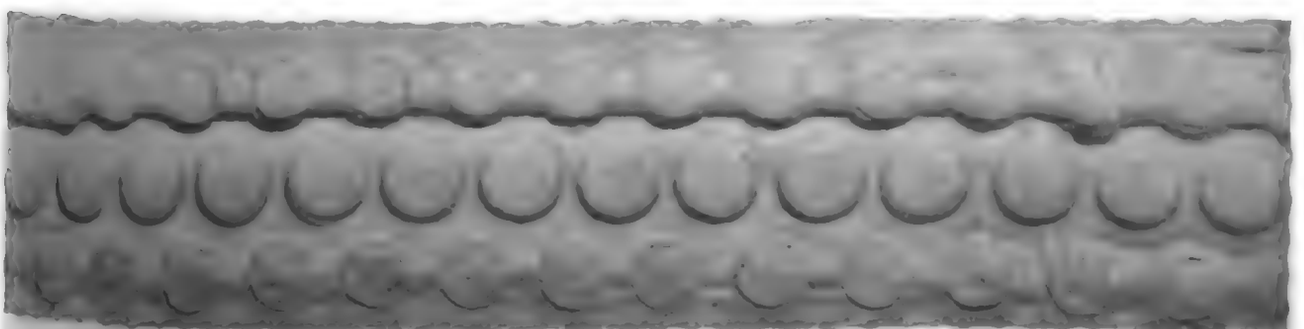
Types—One type

Features—Inner tire is made to be placed between the inner tube and the shoe; it consists of a substantial casing-like structure, which has a thicker portion where the Interlock comes in contact with the shoe and at the beads has two wide, overlapping flaps which serve to lock the device when the tube is inflated. It is endless and has two complete flaps.

BROWN TUBES.

Voorhees Rubber Mfg. Co., Jersey City, N.J.

Brown Scientific Non-Deflating tube is made in some respects similar to a tire; it is built upon a canvas tube and has a greater thickness of rubber on one side, as has a



NON-SKID TREAD PATTERN USED BY FISK RUBBER COMPANY

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tire. After being made, with the canvas inside, it is turned inside out, thus placing the rubber inside; the rubber thereby is compressed to such an extent that when a puncturing object is withdrawn the rubber tends to contract and close up the hole.

Flex-O-Fill Tire Filler.

Flex-O-Fill Core Co., New York City.

Features—Filler molded upon a diameter smaller than that of the average wheel, so that when the filler is placed in a tire the stretching of the surface, if any, is on the side of the filler next to the rim; this causes the outer edge to be compressed so that, should the shoe be perforated and the surface of the filler broken it will tend to close up again and not pull more widely apart, as would be the case were the filler molded in a straight bar. It is guaranteed to last a year if not removed from the casing.

Dayton Airless Tires.

C. J. Cross & Co., New York.

Types—Dayton Airless, in clincher and Q. D. Brown scientific tubes.

Dayton airless construction consists of a tier of rubber blocks, spaced apart within the casing and supporting the tire; freedom from puncture and blowout is claimed without loss of resiliency. Brown tubes are formed upon a canvas casing and then turned inside out, causing the rubber, which is on the inside, to be compressed and to close a puncture immediately following the withdrawal of the object which caused the puncture.

Newmastic Tire Filler.

Newmastic Co., New York City.

Principal ingredients, glue, glucose and glycerin. The placing of the filler in fabric tubes is a late development, as is an arrangement whereby the tubes may be attached to certain forms of Q. D. rims by means of rings and clamps. Non-melting qualities are claimed. Company claims priority in the new over-rim filler field, and probably justly.

American Tubes.

American Tire & Rubber Co., Akron, O.

Features—Patented reinforcement on the side which comes next to the rim, the rubber being considerably thicker at that point, which affords protection against possible injury from pinching or friction with the rim. Tubes are of red and gray rubber. A new type of solid tire is about to be added to the line.

Gibney Truck Tires.

James L. Gibney Rubber Co., Philadelphia.

Types—Solid.

Features—Absence of wires in construction.

Endurance Tires.

Endurance Tire & Rubber Co., New Brunswick, N. J.

Type—Red rubber.

Feature—Quality and color of rubber.

Detroit Puncturine.

Detroit Puncturine Co., Detroit, Mich.

A puncture filling fluid, designed to flow into perforations in the rubber and seal them.

NON-SKID DEVICES.

Woodworth Tire Grips and Treads.

Leather Tire Goods Co., Niagara Falls, N.Y.

Types—Grips, chain and bar; treads, leather and metal studs.

Features—Whereas the former Woodworth treads were not designed for travel upon ice or snow, a new tread, the Double grip, has been added, with the claim that it it is especially adapted for this service and therefore is suitable for use all the year. The new tread consists of a leather covering for the tire, in which are the rivet studs formerly used, which are supplemented by higher studs near the center of the tread. In both old and new treads there are two arrangements, center-studded for smooth travel and full-studded where ruts are likely to be encountered. The tire grips, styled Kant-Skids, consist of linked cross-bars and side chains. Single Kant-Skids are similar to the regular type, except that they consist of individual linked sections which strap around the tire. Prices, each: Full studded, 26 x 3 to 40 x 5½, $11.70 to $41; center studded, 26 x 2 to 40 x 5½, $5 to $31; Double Grips, the same. Kant-Skids, per pair: 28 x 3 to 40 x 6, $4 to $15. Single Kant Skids, 3 to 5½ inches, 50 cents to 75 cents each. Repair boots, studded, $1 to $2.75. Emergency straps, $1.25 each.

Never-Skid Tire Grips.

Never-Skid Mfg. Co., New York.

Type—Bar and center chain, for dual truck tires.

Features—Consist of chain running circumferentially between tires with winged links lying across tread; truck does not have to be jacked up to adjust; creep on tires and do not wear in one spot; joints will stand five tons shear; always one link on the ground; adjusted in five minutes and detached in two; no wear on felloe or rim; no complicated parts. For tires 30 to 42 inches in diameter, with 2- to 6-inch tread. Prices, $30 to $52, for two rear wheels.

Federal Tire Grips.

Federal Chain & Mfg. Co., Springfield, Mass.

Types—Bar and side chain.

Features—The Federal grip is a newly developed product, is made of nickel steel and is designed for use on single, solid truck tires. It is made of several units, each of which is a flat steel circular band bent to ride the tire like a saddle, the sides which touch the tread having rounded edges to prevent cutting of the rubber. The units are connected by side chains and are fastened into position by a hand-operated locking lever. Gaylor grips, for solid dual tires, are of chrome vanadium steel and consist of four round bars, which extend diagonally across the tread, the ends of the bars being bent down toward the rim. Four side chains connect the four grips, the whole forming a continuous line. The locking device is the same as in the Federal grip.

Weed Tire Grips.

Weed Chain Tire Grip Co., Bridgeport, Conn.

Type—Chain.

Features—Grips consist of cross-chains and side-chains, the latter linked to the ends of the cross-chains and extending circumferentially around tire near rim; chains creep and do not wear in one spot; chains afford tenacious gripping qualities. Sizes, 28 x 3 to 40 x 6; prices, $4 to $15 per pair. Rid-O-Skid tire chains, similar to regular Weed grips; sizes, 28 x 3 to 37 x 5½; prices, $2.40 to $5.40 per pair. Weed chain adjusters, consist of chain and spring arrangement lying within the place of the side chain and holding grips tightly upon tires; sizes, 28 to 40 inches in diameter; prices $1 to $1.50. Cross-chains, for repairing broken grips; 2½ to 6 inches; prices, 5 to 18 cents each.

Eureka Tire Grips.

Eureka Non Skid Mfg. Co., Brooklyn, N. Y.

Type—Chain and plate, for dual solid tires.

Features—Gripping qualities are found in toothed, drop-forged steel frames of diamond shape attached to a chain which extends around the tire between the two treads. The province of the chains is only to connect the plates; the latter do the gripping. The device is designed essentially for heavy truck work.

Universal Tire Protectors.

Universal Tire Protector Co., Angola, Ind.

Type—Leather and metal studs.

Features—Tough leather casing for tread, studded with metal projections which grip road. Treads fasten to tire with wire which extends circumferentially around tire at the edge of the tread and the ends of which fasten with a bolt and nut.

TIRE PUMPS.

Skinner Tire Pumps.

Mayo Mfg. Co., Chicago, Ill.

Types—"Spark Plug" and hand.

Features—The "Try before you buy" principle is feature in the marketing of Mayo products. The spark plug pump, the

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leader to the line, is inserted into the spark plug hole and pure air is furnished for ignition by an intake valve in the pump. Price, $10; with gauge, $2 extra. In the hand pump line the two smallest are the Skinner single-acting and the compound type; prices, respectively, $1.75 and $3.50. The Skinner compound lever pump is adapted for garage use and consists of a lever, two cylinders and 6 feet of tubing; price, $12.50, pressure gauge attached, $2 extra. Another pressure indicating pump is the same as the compound model, except that a gauge is attached with the dial at the foot of the lever pointing upward toward the operator; price $5

Minimax Tire Pumps.

Herz & Co., New York City.

Types—Electric, gear or belt and friction drives.

Features—The Minimax, which operates by means of a small motor set upon the tank, is mounted on wheels so that it can be moved where desired; the machine consists of an air compressor, ¾-horsepower motor, tank, safety valve, connecting wire and steel armored hose. Direct or alternating current can be used. Tank is 24 inches. Price, for direct current, [illegible] alternating, $135. A "B. B." pump consists of a cylinder, piston, tubing and attachment, power to be furnished by some motor; price, $30. A "Tandem" type is equipped with a handle and a hook for the operator gripping the handle to press the wheel against any part of the car, thereby operating the pump; price, $20.

Kellogg Air Pumps.

Kellogg Mfg. Co., Rochester, N. Y.

Type—Four cylinder, silent-chain or gear drive.

Features—The purpose of the Kellogg pump is changed; whereas it formerly was used only as a tire inflator, it now is equipped with a disk distributor and can be used as an engine starter, also. The pump is started by pressing the foot upon a button on the dash, which causes air to pass from the storage tank, through the distributor and to the proper cylinder. The pump may be operated from the dash, and when the storage tank, which also may be used as a foundation, has 150 or 200 pounds pressure the pump is thrown out of operation. The apparatus weighs 40 pounds.

National Tire Pumps.

National Motor Supply Co., Cleveland, O.

Type—"Spark plug."

Features—Pumps only pure air into the tire. It consists of a cylinder and piston, the piston rod having a threaded pipe which screws into a spark plug hole, a valve which admits pure air into the pumping chamber, a tube leading to the tire and a pressure gauge in this tube. The piston is operated by the compression in the engine cylinder, exerted through the spark plug hole. Air spaces at each end of the pump cylinder prevent noise. Weight, five pounds. Price, complete, $15.

Hartford Tire Pumps.

Hartford Machine Screw Co., Hartford, Conn.

Type—Gear operated.

Features—The distinctive feature of this pump is in its internal construction; compression is obtained through a tightly fitting piston and cylinder, the piston being operated by a connecting rod which is actuated by a toggle mechanism wherein the piston is attached to one end of the actuating arm and the crank-shaft applies its power at the center, giving a piston stroke twice as long as the throw of the pump's crank-shaft.

Turner Air Pumps.

Turner Brass Works, Sycamore, Ill.

Type—Double-cylinder and hand lever.

Features—Pump consists of two cylinders at opposite ends of base and operated by vertical hand lever. Designed for garage service. Price, $10.50; with pressure gauge, $11.50.

Imperial Air Pumps.

Ingersoll-Rand Co., New York City.

Type—Portable, motor driven.

Features—Small single-acting air-cooled cylinder, with but one valve, the discharge; mounted on a dustproof frame. Six feet of ½-inch hose and 20 feet of lamp cord. Two sizes, for private and public garages.

TIRE GAUGES.

Mayo Tire Gauges.

Mayo Mfg. Co., Chicago, Ill.

Types—Pencil and dial.

Features—The dial type of gauge is capable of measuring 200 pounds overload in excess of the highest common tire pressure, obviating the necessity of resetting the hand when the operator causes fluctuations by quick, jamming motion of the pump. The device attaches to the valve stem. Price, $2. The Little Gem, pencil type gauge, is 3½ inches long and sells at 50 cents.

Edelmann Pressure Gauges.

E. Edelmann & Co., Chicago, Ill.

Types—Tube and dial.

Features—In the Edelmann gauge No. 1, which is attached to the valve by pressing tube into place, the dial is made this year with a red indicating hand, which gives easy reading and remains at the reading until reset. Price, $1.50. No. 3A is a new product and sells at $1.75. No. 4, for use on power pumps, is designed for use in a hose line and is new. Price, $1.50. An automatic air chuck, designated as No 47, has a valve, which opens when applied to air valve and closes as soon as removed. Suitable for free air service. Parts are interchangeable. Price, $1. A pump connection, No. 46, has a tapered nipple taking several sizes of tubing. Price, 25 cents.

United States Tire Gauges.

United States Gauge Co., Bridgeport, Conn.

Types—Dial.

Features—The Invincible gauge, which is a feature of the United States line, resembles a watch except that at the bottom is a projection for attachment to the valve; resetting is accomplished by pushing a small button. Price, $2. Other dial-type gauges are included.

Schrader Tire Gauges.

A. Schrader's Son, Inc., 28-32 Rose street, New York City.

Type—Pencil.

Feature—Small and compact, 2½ inches long; reading remains fixed until gauge is readjusted, this being done by pressure of finger. Price $1.

National Pressure Gauge.

National Motor Supply Co., Cleveland, O.

Type—"Honest" gauge; pencil type.

Features—Registers pressure after being removed from the tire. Pressure on valve causes pressure to register and plunger is pushed back into place for further readings. Price, $1.

VULCANIZERS.

Shaler Vulcanizers.

C. A. Shaler Co., Waupun, Wis.

Types—Electric, alcohol and gasolene, portable and stationary.

Features—New model, the Vul-Kit, just introduced, is portable and consists of round, metal, closed receptacle with detachable handle, gasolene generator, which distributes flame over bottom of vulcanizer, asbestos pad on which tube rests, and clamp which holds heated surface to tube. Claimed to vulcanize all the way through and not just on surface. Type B, portable, electric, uses direct or alternating current; designed for garage use; iron model, $20; nickel-plate aluminum, $25. Type C, exclusively for outer casings; with thermostat, alternating current, $20; with rheostat, direct current, $25. Type E vulcanizes from 1 to 6 tubes at a time; with thermostat, alternating current, $25; with rheostat, direct current, $30. Type D, portable, electric, designed for car owners; iron model for direct current, $12.50; for alternating, the same; nickel-plate models for both currents, $15. Type

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J is heated by alcohol lamp and sells for $10.

Gibney Vulcanizers.

James L. Gibney Rubber Co., Philadelphia.

Types—Eleck-Trick, Rheostat and Steam; portable and stationary.

Features—Efficiency and quickness of work; low operating expense. Eleck-Trick, with rheostat, wired for 110 or 220 volts, alternating or direct current; fitted with 10 feet of cord, plug for lamp socket, asbestos pad and bracket for tube work, clamp, thermometer, cement, repair materials and tools, $15. Rheostat vulcanizer, rheostat, which is for heat regulation, also can be attached to wall with bracket which is furnished, wired for 110 or 220 volts, same equipment as with Eleck-Trick, $18. Steam vulcanizer, can be used in any position or at any angle, fire box is removed from vulcanizer proper and is suspended on a projecting pipe, alcohol fire pot in swivel acting basket, adjustable ventilator for regulation of heat same equipment as with Eleck-Trick, $15. Garage tool kit, consisting of stitcher, awl, shears, wire buffing brush, pliers, knife and cement brush, $3. Multiple tube vulcanizer, accommodates six tubes at same time, heated on thermostatic principle and has thermometer at each end, $25.

National Vulcanizers.

National Motor Supply Co., Cleveland, O.

Types—Steam garage and portable and Mascot gasolene portable.

Features—Simplicity of operation is claimed as the chief feature for the garage vulcanizer. It consists of a steam chamber, gauge and three vulcanizing plates, all operable simultaneously. Machine generates its own steam and is said to cost 1 cent an hour for operation; will vulcanize space 4 x 8 inches; casing molds are curved both ways; tube plate, 7 x 16 inches. Weight, 80 pounds. List price, complete, $60; discounts to garages.

The steam portable type consists of a hollow metal body filled partly with water and sealed, never having to be refilled. A small alcohol lamp generates steam and a thermometer tells the temperature; vulcanizing can be done, it is claimed, in 15 or 20 minutes; surfaces are curved or flat. The weight is 5 pounds and it sells for $12.

The gasolene portable consists of a chamber in which gasolene is placed and burned, the device being clamped against the part to be vulcanized. Weight, 3 pounds. Price, $5. Vulcanizing materials.

TIRE SUNDRIES.

Essex Rubber Goods.

Essex Rubber Co., Trenton, N. J.

Inner sleeves, $1 to $2; blowout patches, style B, 40 cents to 50 cents; style C, 48 cents to $1; style D, 50 cents to 70 cents; tire sleeves, style A, 35 cents to 50 cents; unvulcanized shoe liner, style E, 28 cents to 70 cents; plaster, style H, 12 cents to 30 cents; Hook-On outer boot, with style H plaster, $1.50 to $2.50; laced outer boot, $1.20 to $1.80; Perfection rubber goggles, $72 per gross, extra amber lenses, 10 cents per pair; Standard reliner, sizes 28 x 3 to 38 x 5, $3.30 to $7.45; Perfection reliner, sizes 28 x 3 to 38 x 5, $5.20 to $11.78; asbestos metallic gasolene engine packing, 78 cents and 80 cents; Pyramid matting, white, black or red; red rubber generator tubing; red rubber lamp connections, 14 inches long, $48 per gross; flexible metal gas lamp connections, 14 inches long, $48 per gross; pump and radiator hose; asbestos brake lining, 1 inch to 4 inches wide, ⅛ to ¼ inch thick, 32 cents to $1.88; rubber spring bumpers, 55 cents, 90 cents and $1.25; round rubber spring bumpers, 50 cents, 65 cents and 90 cents.

Narco Tire Repair Materials.

National Rubber Co., St. Louis, Mo.

The National line includes: Narco non-inflammable, triple-strength rubber cement, sold in 4-ounce can, 25 cents; 4-ounce tube, 25 cents, and pint can, $1. Narco tire-cut filler, a liquid in collapsible tubes, $1 Rubber reviver and refinisher, a liquid rubber varnish for rejuvenating and refinishing, 50 cents to $2.

Young Tire Repair Materials.

O. W. Young, Newark, N. J.

The Young line includes: Fill gum, $1; blowout patches, with flexible flap, $1; Blanco tire repairers, of rawhide, $1.50; Waterproof tire repairers, $1.50; corrugated semi-cured patches, 50 cents per dozen; tire chalk, in tube, 25 cents; self-vulcanizing patch outfit, consisting of eight patches, sandpaper and cement, $1.

Dykes's Vulcanizing Materials.

John L. G. Dykes Co., Chicago, Ill.

The Dykes line includes: Reliners, two styles, prices, $4.25 to $15; Never Kreep inner shoes, $1.25 to $1.90; Double Lock inner shoes, 70 cents to $1.90; tire boots, $1 to $2; repair gums; bolted-on outer boots, $2.25 to $4.25.

Wheels and Rims

Prophecies of twelve months ago that the quick detachable and other fixed rims were destined soon to be superseded by the demountable type have not been fulfilled, for while the demountable rim has made substantial progress it has not swept the quick detachable before it and both retain the attention of manufacturers. There is nevertheless a distinct trend toward demountability, which has been responsible for several new types, notably the "Stanweld," brought out by the Standard Welding Co., of Cleveland, O., and others offered by the Baker Rim Co., of Akron, O., the General Rim Co., of New York, and the Newmastic Co., of the same city. In the demountable class there also is a marked favoritism shown for such a rim in connection with wire wheels.

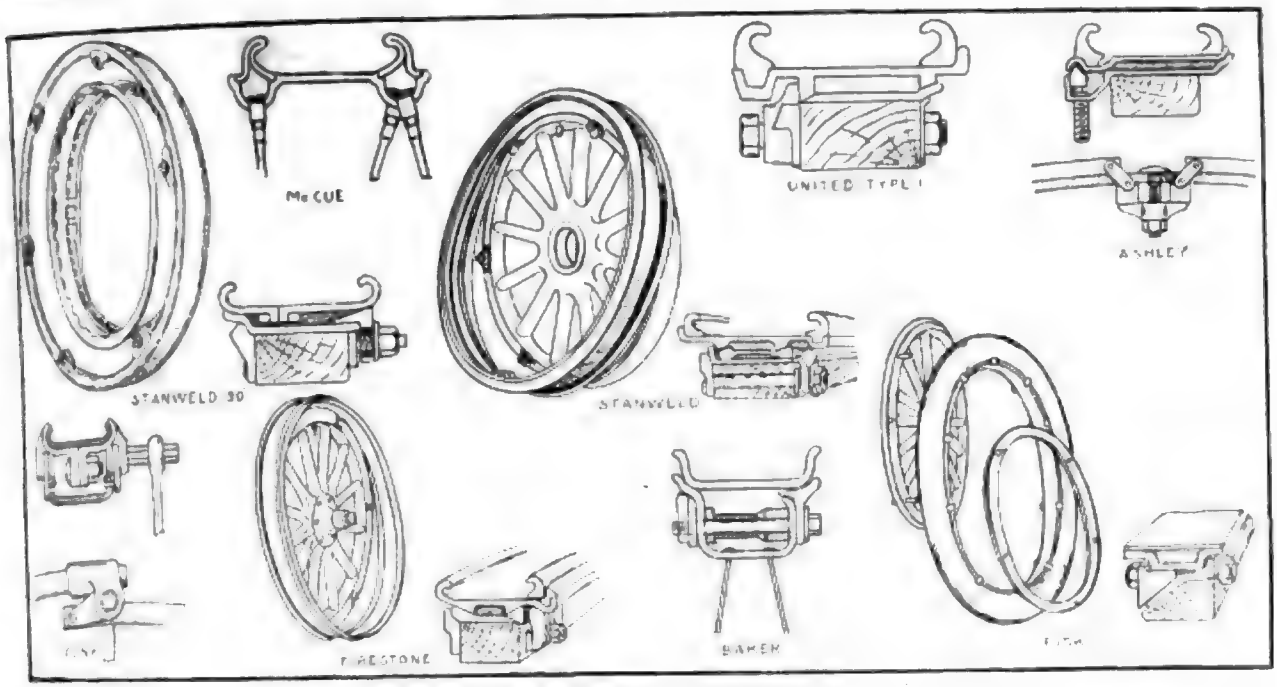
Wire wheels, too, have made marked progress since last year's show, when one of them occupied an inconspicuous corner of the booth of the McCue Co., of Buffalo, N. Y. Retaining pride of priority, the McCue Co. has gone a step further and has developed a Q. D. rim wherein fewness of parts is obtained through combining the felloe and rim base as one piece. New arrivals in the wire wheel field are E-C Sales Co., of Chicago, the Baker Rim Co., of Akron, O., and the General Rim Co., of New York, the last two of which have evolved demountable rims for wire wheel use.

The Baker is minus the conventional felloe, having a special construction and locking device, while the General company's wire demountable, the Ashley, has a felloe but is marked by an original and quick locking device. The E-C company has gone further yet in demountability and removes the entire wheel, a few simple operations being all that are required. E-C wheels, also, are of wire or wood. Quick detachable rims are as numerous as heretofore, but the newness in the field centers mainly in the demountables.

The tendency to avoid complication and weight has resulted in the Newmastic Co.'s "No-Felloe" rim, which rests in clamping devices into which each spoke is tenoned and each clamp and rim rest is a separate part. Consideration is given to straight-side tires by the rim makers and in the new products provision for this equipment is common. Making it easier for the one who has to manipulate the rim is a primary object and the United and Funk rims, the latter made by the General Rim, are split and the ends are made to overlap when it is desired to remove a tire, thus shrinking the rim base and forcing a tightly stuck casing to loosen. Quick-detachable-demountable combinations have been worked out in several instances, designed doubly to meet demands.

Metal wheels, designed primarily for truck use, also are receiving more notice than usual, the wheel of that type produced by the Sheldon Axle Co., of Wilkes-Barre, Pa., being the most notable development of the year.

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RIMS THAT EXEMPLIFY WIDELY VARYING PRACTICE

STANWELD RIMS.

Standard Welding Co., Cleveland, O.

Types—Detachable and demountable, for pleasure and commercial cars.

Features—The Stanweld Demountable rim is comparatively new, and is distinguished by its locking construction. The rim consists of flanges, rim base, adjusting nuts, felloe band and locking clamps; the rim is held by pressure of six clamps against the locking ring, which is a wide band having bearing surfaces at each side of the rim. The operation of the nuts in these clamps locks and unlocks the rim, and when loose the lateral position of the rim base may change.

Stanweld detachable rims are locked by a wedge device, consisting of a double-sided cam which, when the wide portions are within the circumference of the wheel, catches into slots in projections on the split ring, the projections setting into holes in the rim base. The cams are operated by a spring steel lever which, to lock, swings under the outer edge of the rim base and fastens. All types are fitted for clincher and straight side tires.

UNITED RIMS.

United Rim Co., Akron, O.

Type—Quick Detachable, Demountable and Quick Detachable-Demountable.

Features—Types are exhibited under the company nomenclature of Nos. 1, 2, 3 and perhaps 5, the first three both demountable and Q. D.; No. 5 a new type, now in the hands of the makers, and certain internal problems govern as to whether it will be shown. No. 1 quick detachable has a base which is shrunk permanently onto the wheel rim and takes tires of the clincher or straight-side type; locking of the inner side ring, which is the part that holds the device together, is accomplished by means of two L-shaped lugs and a T-bolt. The front side ring of No. 2 quick detachable is secured by means of an L-shaped split locking ring, engaging a groove in the rim base. No. 3 quick detachable is circumferentially split and is held together by a series of bayonet hooks and lugs or frets. Opposite rotary motion of the sections locks and unlocks the rim. In the demountable types, No. 1 consists of side rings, rim base and locking nuts, the base being solid. This rim is built for all straight-side and clincher tires, as is No. 2, which is similar to No. 1. No. 3 demountable has a split base, which is held together by a flange on one side of the felloe band and a nut clamp and wedge on the opposite side. Different forms of base permit of the use of every different type of tire.

Endless side rings constitute a feature of all United rims.

FISK REMOVABLE RIMS.

Fisk Rubber Co., Chicopee Falls, Mass.

Types—Two, for single and dual tires.

Features—Exceptional ease of removal and a continual bearing surface. The rim has but three essential parts—wheel rim, tire rim and expanding ring. The tire rim is flat and hollow, eliminating considerable weight; the wheel rim is beveled on one side and the expanding ring has a beveled side to meet the bevel of the wheel rim. The ring is drawn into place by five bolts which pass through the expanding ring, wheel rim and felloe, the tightening of the nuts locking the tire rim into place. An angle valve eliminates the necessity for a valve hole in the rim.

ASHLEY AND FUNK RIMS.

General Rim Co., Broadway and West 64th street, New York City.

Types—Demountable. Also Ashley wire wheel with demountable rim.

Features—These products are of recent origin. The Ashley wire wheel has a demountable rim which is carried upon a felloe band, as on a wood wheel, but the novelty of the device is its locking scheme. The Ashley rim is pushed onto the felloe band, where it rests upon a raised bead at the back; the front side of the rim contains a groove and in the felloe band, fitting into this groove, is a split ring which is contracted or expanded by the turning of one toggle nut. When expanded it holds the rim in place and when contracted permits easy release.

The Funk rim is split across and is removed from the tire by the application of an operating tool which causes the rim ends to separate and overlap by several inches, thus compelling the tire to loosen. The rim is bolted on.

BAKER RIMS.

Baker Rim Co., Chicago, Ill.

Types—Demountable. For wood and wire wheels.

Features—The newest Baker rim is a demountable for wire wheels, which differs from the ordinary demountable construction in that essential parts are reduced to a minimum, there being no flat felloe band which is the regular form of support in demountable construction. The wire spokes

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attach to channeled band of special construction and the rim rests directly upon this, being locked with bolts and locking plates. Another Baker type is the Bolted-On, for which, as in the case of the wire wheel rim, is claimed ease of handling lightness, simplicity and waterproof qualities. Either clincher or straight-side tires may be used by the reversal of side rings. The Bolted-On rim is split across, which makes the removal of a tire simple; the split is covered by a valve stem spreader, protecting the tube. The rim is held together by an anchor plate into which fit four driving studs on the rim, two on each side of the split, the plate being held to the rim by a lock nut. The valve stem protrudes through a hole in the rim and anchor plate.

McCue Rims and Wire Wheels.

McCue Co., Buffalo, N. Y.

Types—Rims, Q. D. with reversible flanges.

Features—Fewness of parts and ease of operation are factors in the McCue rim, the former helping to accentuate the light weight which is claimed for wire wheel construction. The rim, which is new, consists merely of one band, which takes the place of both felloe band and rim base and which, at the outer edges, has two grooves containing the ends of the wire spokes. These grooves also serve to seat the flanges, which will take either Q. D. or straight-side tires by the reversal of the flanges. The McCue wheels are designed to fit the McCue or any other axle.

Peck Wheels.

Peck Wheel Co., Chicago, Ill.

Type—Spring and cushion.

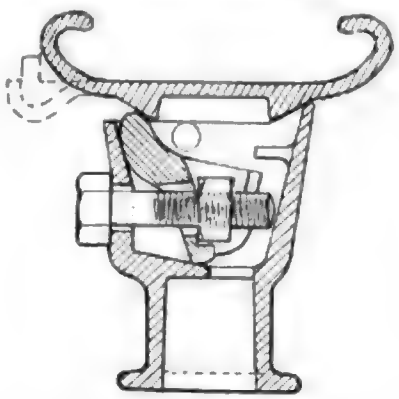
Features—Piston spokes, pivoted at rim and hub, are the sources of resiliency; wheels are made in Models A and B, the latter, a new design, differing from the former in that it is equipped with an airless instead of a pneumatic tire. The load is supported by the upper spokes of the wheel at all times; the spoke consists of a cylinder and piston, the latter obtaining its first springing power from a spiral spring within the cylinder and latterly from an air cushion at the head of the spoke. The spokes of the lower half of the wheel are not called upon to sustain any of the load. The pivoting of the spokes is designed to afford a flexible drive similar to drive through the springs, the axle, in starting, turning ahead of the rim. Parts are interchangeable; noiselessness and ability to operate without necessity for adjustment are claimed.

Newmastic Rims.

Newmastic Co., New York City.

Type—"No-felloe" demountable.

Features—Made under the Gibson patents, covers a demountable rim with no felloe; the spokes are tenoned to receive a clamp which, at its outer end, consists of a channel-like cavity of which the inner edge is 7 32 inch higher than the outer. The rim is fitted with angular surfaces, the one at



the inner side resting upon the higher edge of the clamp while the angular surface at the outer edge is pressed upward and toward the inner side of the wheel by a short arm, operated by a bolt. In case it is desired to use other types of rims with the clamps, the angular surfaces can be riveted into place. Claims for this construction are: Economy of construction, strength and security, the wheel being expanded into the rim instead of vice versa; light weight, facility of operation.

Firestone Rims.

Firestone Tire & Rubber Co., Akron, O.

Types—Quick Detachable - Demountable, for single or dual tires.

Features—Rim and tire can be removed or tire can be removed without removing rim from wheel; rim base is not split, which prevents water getting into the tire through this part; operations are simple and easy; parts are few and do not rust together; no rim tools. The rim consists of clincher side ring and locking ring, clamping ring, rim base and nut clamp. The clamping ring makes the rim adaptable to variations in wheel sizes.

Sewell Cushion Wheels.

Sewell Cushion Wheel Co., Detroit, Mich.

Cushion wheels which are made very resilient by the use of two bands of rubber—the usual tire on the rim and a second rubber cushion between the inside of the rim and the periphery of the wheel proper. The inner band of rubber is clamped to both wheel and outer rim. Tire and inner band are solid rubber.

Features—Long life under hard usage; resilience equal to that of pneumatic properly inflated; none of the troubles that occur to pneumatic tires.

E-C Demountable Wheels.

E-C Sales Co., Chicago, Ill.

Types—Wood and wire.

Features—Drive through an irregular taper, all wheels are interchangeable; method of lacing the spokes from the inside of the hub to the outside of the rim and from the outside of the rim to the inside of the hub permits of the use of a short hub on the wire wheels without sacrificing anything in the way of lateral strength.

Jones Wood Wheels.

Phineas Jones & Co., Newark, N. J.

Types—All sizes of wood artillery wheels built on the wedge principle are stocked. Heavy wheels for use on commercial vehicles also are shown.

Features—Second growth hickory, well seasoned, used in the construction of the wheels; greatest care exercised in the fitting.

Wood Wheels.

Schwartz Wheel Co., Philadelphia, Pa.

Wood wheels built on the wedge principle are made in all sizes. Second growth hickory, well seasoned, enters into the construction.

Ignition Apparatus

In the matter of ignition, development for the better part has been carried along lines indicated by past experience. At two points, however, the line of development has swerved to paths more or less radical in nature. The Hi-Fre-Co system, for instance, which has been taken up by the Dean Electric Co., of Elyria, Ohio, is an innovation which marks a distinct departure from the practice of igniting the fuel in the cylinders of internal combustion motors—the use of currents which are not only high at potential, but which also have a short period of oscillation—in other words, high frequency currents. The Dean system is not at all complicated; mechanically it is equally as simple as the ordinary magneto system; it embraces the use of a low-tension magneto incorporating a distributer. A series coil, or "kick" coil, is inserted in the path of the current between the distributer and the plug; on the plug the coil which is the very heart of the system is placed—a Tesla transformer, which not only raises the potential of the current to a point where it will jump the air gap, but also causes rapid oscillation which instills into the current properties or characteristics which are foreign to the ordinary high-tension spark and make for easier ignition of

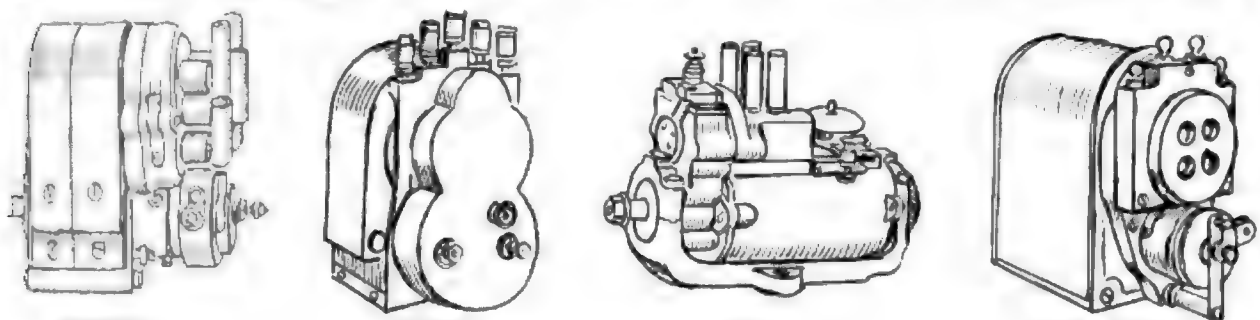
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the compressed gases within the cylinders. The second radical departure from orthodox practice is exemplified by the V-ray spark plug, produced by the V-Ray Spark Plug Co., of Marshalltown, Iowa. While in practically every other brand of plug on the market, and plugs are legion, the presence of a chamber around that part of the insulating material which enters the engine is claimed to prevent the formation of carbon and shields, to a greater or less extent, the electrode from the excessive heat, is considered unnecessary; in the V-Ray plug, however, such a chamber is provided. The insulating material, which is lava at the lower end and mica above, fits snugly into the shell and is rounded off to meet the sides of the shell. The construction, it is claimed, puts the spark where the spark should be, and by virtue of the very great heat—the lava electrode is capable of withstanding high temperature without disintegration—the accumulation of carbon is prevented, for it is immediately burned.

In the matter of spark plug improvement, development has taken three courses—the methods of mounting the insulators so as to allow for expansion and contraction under change of temperature without incurring rupture, and of packing the joint so as to prevent leak, have been altered somewhat; cognizance has been taken of the fact that alloys suitable for use with battery ignition are not capable of withstanding for long periods the high temperature of the magneto spark, and in several instances harder alloys and in one case platinum tips have been used for plug electrodes; combinations of plugs with priming cocks for the injection of gasolene into the cylinders in cases where priming cups are absent, and with ports provided with ball checks for the admission of gas in connection with ignition type of engine starter have appeared in a variety of forms. Combinations of porcelain or lava, which are ideal as insulators under high temperature and do not absorb oil and grease, and mica, which is not easily broken and more suitable for use outside the cylinder, in the insulation of plugs are now on the market.

Changes in magneto design have been more in the way of preventing the ingress of dirt and moisture than in the direction of increasing the sparking efficiency of the devices, and this practice, which has resulted in the enclosure of the magnets by plates and the elimination of corners and projections which are liable to collect dirt, is responsible for the clean-cut appearance of the devices taken as a whole. Automatic advance of the spark still holds its own, though with the manufacturers of ignition outfits it is not being pushed to any great extent.

The more general use of the electric type of engine starter has given increased impetus to the development of quick break timers and distributers and unit spark systems for use in connection with the dynamos and batteries which must needs be carried; the under the hood location for spark coils and the development of coils of the "kick" switch type have made long strides.



FOUR DIFFERING TYPES OF MODERN MAGNETOS

Remy Magnetos.

Remy Magneto Co., Anderson, Ind.

Models—Made in ten models: Models RF and RD are similar and are made in two sizes for use with either two-, four- or six-cylinder motors; Models L, S and T are made for use with either two-, four- or six-cylinder motors.

Features—Inductor type, no wires attached to revolving member; durable and efficient.

Prices—Models RD and RF, for two-cylinder motors, $40; four-cylinder motors, $50; six-cylinder motors, $52.

Splitdorf Magnetos.

Splitdorf Electrical Co., Newark, N. J.

Models—Made in seven models for motor cars and two models for motorcycles. Model B is for four-cylinder motors of the heavy duty type; Model D is for light four-cylinder motors. Model G is for two-cylinder motors. Models S and SS are for six-cylinder motors; the latter is for heavy motors; Model L is intended for use in connection with make-and-break ignition systems; Models O and T are for four-cylinder motors where the space is limited; model T has a vertical distributer block. Two new models incorporating the secondary winding in the armature are being made, but are not yet listed.

Features—Hot spark at low speeds; best of materials and workmanship.

Prices—Model B, $125; Model D, $100; Model G, $80; Model S, $125; Model SS, $140; Model L, $40; Model O, $90; Model T, $100.

Mea Magnetos.

Marburg Bros., Inc., New York City.

Models—Built in 22 models, two for single-cylinder motors, three for double cylinders, two for three cylinders, four for four cylinders, four for six cylinders, and one for eight cylinders in the single spark instruments; for dual ignition three models are built for four-cylinder motors and three for six cylinders. The respective models are styled as A1, BE1, A2, BE2, BD2, BK3, BH3, A4, BK4, BH4, CH4, A6, BK6, BH6, BH8, BK4 Dual, BH4 Dual, CH4 Dual, BK6 Dual, BH6 Dual, CH6 Dual. In each group the types listed last are for medium and heavy motors.

Features—Rotatable bell magnet insures the production of a spark which does not vary in intensity as the spark is advanced and retarded.

Prices—A1, $40; BE1, $58; A2, $48; BE2, $58; BD2, $73; BK3, $75; BH3, $98; A4, $60; BK4, $75; BH4, $98; CH4, $130; A6, $80; BK6, $105; BH6, $120; CH6, $155; BH8, $145; BK4 Dual, $115; BH4 Dual, $140; CH4 Dual, $180; BK6 Dual, $150; BH6 Dual, $165; CH6 Dual, $200.

Kent Unisparker.

Atwater Kent Mfg. Works, Philadelphia, Pennsylvania.

Models—Seven models, the two smaller of which are for single-cylinder and two-cylinder opposed motors and are without a distributer; the other models for 2, 3, 4, and 6 combining an automatic timing advance; all include a distributer.

Features—One spark instead of a shower

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of sparks; very rapid break, which gives a hot spark and conserves electrical energy; moving parts very light, so that wear is reduced to a minimum; adaptable to all motors.

Prices—Single-cylinder with standard coil, $18; double opposed, with standard coil, $20; two-cylinder with standard coil, $27; with kick switch coil, $30; three-cylinder with standard coil, $30; with kick switch coil, $33; four-cylinder with standard coil, $30; with kick-switch coil, $33

Hi-Fre-Co Ignition Systems.

Dean Electric Co., Elyria, O.

Models—One model for use in connection with a four-cylinder motor and comprising a long-tension magneto, a set of series coils, a set of spark plugs provided with Tesla coils.

Features—The use of high-frequency current for the ignition of gases; not subject to short circuiting, since all wiring right up to the plug carries low-tension current; large range of spark plug openings; freedom from burning of plug electrodes; non-fouling of plugs.

Price—$75.



KENT UNISPARKER

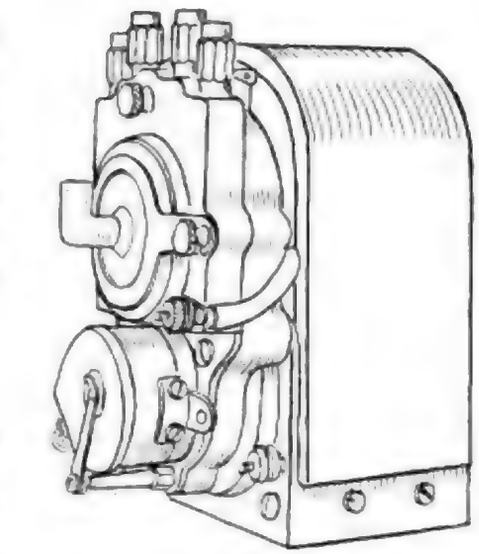
Kingston Magnetos, Coils and Plugs.

Kokomo Electric Co., Kokomo, Ind.

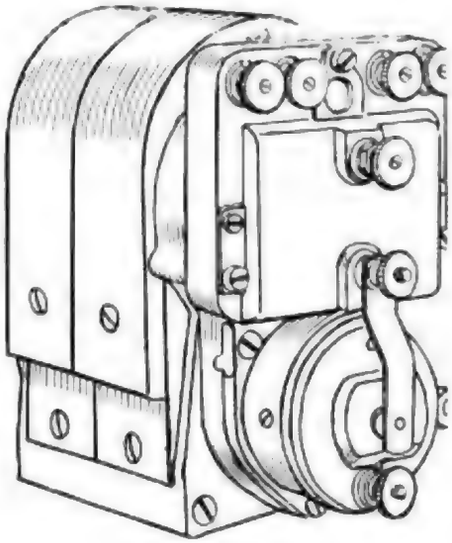
Models—Kingston magnetos built in three models. Model B is designed for use either with two- or with four-cylinder motors. Model C is for use with single- or double-cylinder motors. Model D is similar to Model B, save that an extra magnet has been added by way of increasing its efficiency, and it has been made quite a little heavier for use on heavy-duty, slow-speed motors. Coils in a variety of models are made, the more important being the dash coil with switch, which is put out for 1-, 2-, 3-, 4- and 6-cylinder motors; the dash coil with back terminals, which is put out in similar sizes; open box coils made for motors with from one to four cylinders inclusive; covered box coils made in similar sizes and a special four-cylinder coil made for Ford cars which embraces the use of a master vibrator. The Kingston mica plug is built in three sizes, ½-inch, A. L. A. M. standard, and metric.

Features—On the magnetos, ball bearings are used throughout, all parts requiring attention are readily accessible without the use of tools. On the coils, the secondary terminals are protected by special imported black glazed porcelain.

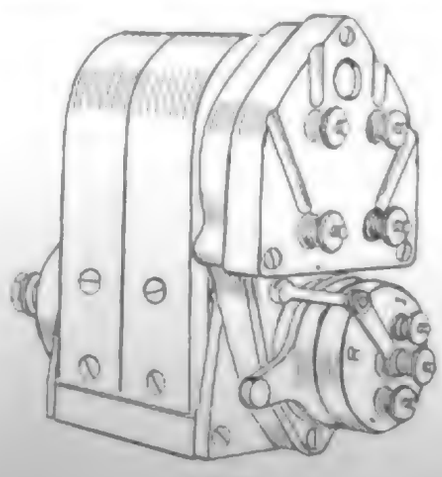
Prices—Magnetos: Model B, $60; Model C, $40; Model D, $75. Prices include transformer coils. Dash coils: 1-cylinder, $7.50; 2-cylinder, $13.50; 3-cylinder, $19.50; 4-cylinder, $25.50; 6-cylinder, $37.50. Open box coils: 1-cylinder, $4.50; 2-cylinder, $9; 3-cylinder, $13.50; 4-cylinder, $18. Closed box coils: 1-cylinder, $4; 2-cylinder, $8; 3-cylinder, $12; 4-cylinder, $16. Special Ford coil, $30. Half-inch Kingston plug, 75 cents; A. L. A. M., 90 cents; Metric, 90 cents.



REVISED REMY



ELYRIA-DEAN HI-FRE-CO



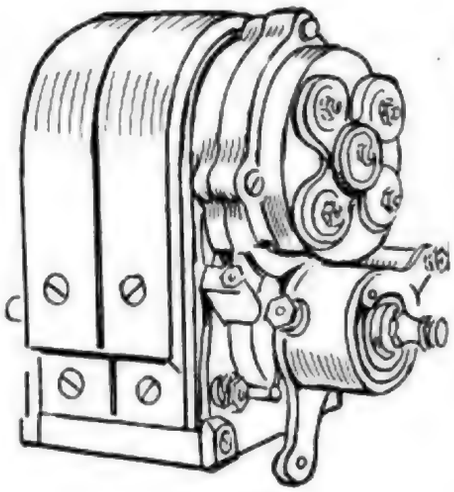
SIMMS

Rhodes Unit Spark System.

New York Coil Co., New York City.

Models—Unit Spark system built in five models for single, double opposed, double vertical, three- and four-cylinder motors. The models for double vertical, three- and four-cylinder motors are provided with a rotary distributer; a distributer is not necessary on the other two models. Rhodes timers and high-tension distributers are made in four models for two-, three-, four- and six-cylinder motors. Plain box coils are made for single-, two-, three-, four- and six-cylinder motors, known, respectively, as Models 10, 11, 12, 13 and 14. Models 60, 61, 62, 63 and 64 are covered box coils for the respective motors. Models 20, 30 and 40 are covered box coils with removable units for single-, three- and six-cylinder motors, respectively. Models 25 and 35 are similar, but differ in that they are provided with an improved switch.

Features—Unit system: Single spark, economy of operation; impossible for contact to be made with the motor stopped or turning in the wrong direction. Timers: Length of contacts can be varied by turning one screw while the motor is operating; wearing surfaces do not make and break contact; rubbing contact is established which insures clean contact points. Coils:



SPLITDORF

All secondaries are sectional winding; windings anchored in the containing case; platinum-iridium contact points.

Prices—Unit Spark system: Single-cylinder, $18; double opposed, $20; double vertical, $27; three-cylinder, $30; four-cylinder, $30. Timers: Two-cylinder, $16; three-cylinder, $17; four-cylinder, $18; six-cylinder, $20. Coils: Model 10, $7.50; 11, $15; 12, $22.50; 13, $30; 14, $45; 60, $6.25; 61, $12.50; 62, $18.75; 63, $25; 64, $37.50; 20, $12; 30, $30; 40, $50; 25, $20; 35, $35.

Motsinger Auto-Sparker.

Motsinger Device Mfg. Co., Lafayette, Ind.

Models—One model, which delivers up to 3 amperes at 15 volts.

Features—Frictional contact with the wheel of the motor reduces the trouble of regulation to a minimum; governor ensures the operation of the device at a constant speed; the capacity of the Auto-Sparker having been increased, it now is utilizable

so as to prevent ingress of dirt; compact and light.

Prices—To the trade only.

Simms Magnetos.

Simms Magneto Co., New York City.

Models—Made in two models, SU4 for four cylinder motors delivering a single spark to each cylinder and SU4-S, dual for four-cylinder motors.

Features—Very hot spark at low speeds with spark retarded; compactness; but little wiring; durability.

Prices—Not settled.

K-W Magnetos.

K-W Ignition Co., Cleveland, Ohio.

Models—Made in several models and sizes.

Features—All are of the low tension type and can be belted, geared or driven by friction wheel from any convenient revolving member.

provided with porcelain insulators and four with lava and mica insulators; in each class there are a Standard half-inch plug, a metric plug, a Standard ⅜-inch plug and a Standard motorcycle plug.

Features—The lava-mica plug is distinctly new and radical in that no chamber around the insulator is provided, the lava insulation protruding in the form of a dome. Four electrodes converge toward the central electrode on all V-Ray plugs, the ends of each of the four being provided with a V-shaped slot.

Prices—All sizes of the lava-mica plug sell at $1.25; of the porcelain plug, at $1.

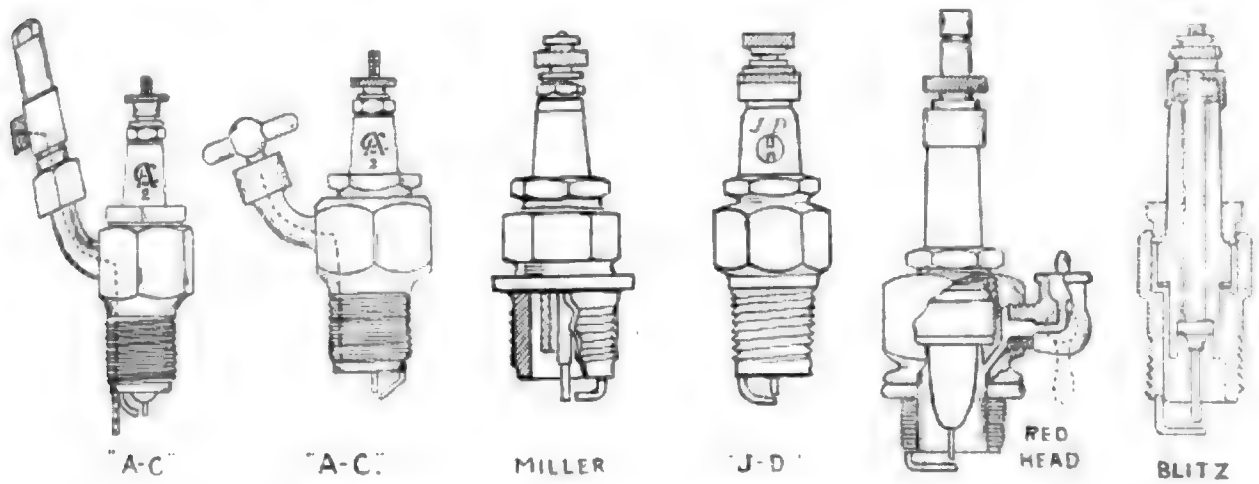
Heinze Magnetos and Coils.

Heinze Electric Co., Lowell, Mass.

Spitfire and Breech-block Plugs.

A. R. Mosler & Co., New York City.

Models—Spitfire plugs made in six models for ½-inch or metric sizes and four models



PRIMING PLUGS AND OTHER PLUGS OF RECENT ORIGIN

several lamps as well as for the ... of the ignition system.

Price—$...

Briggs Magnetos.

Briggs Magneto Co., Elkhart, Ind.

Models—Made in three models: N-4 is ... for use with four-cylinder motors; N-6 is ... for use with six-cylinder motors and D-4 ... with four-cylinder two-cycle motors.

Features—Guaranteed for life of the car to which they are attached; hot spark at low speeds; require no attention.

Prices—N-4, $70; N-6, $80; D-4, $90, with ...

Herz Magnetos.

Herz & Co., New York City.

Models—For automobiles, built in a single model for use with four-cylinder motors known as K4.

Features—Fully enclosed with aluminum housing; U-shaped magnets, ground to fit.

Pittsfield Magnetos and Coils.

Pittsfield Spark Coil Co., Pittsfield, Mass.

High tension magnetos of the latest type and a full line of coils for all kinds of ignition work. Also Jewel spark plugs with mica, porcelain and combination insulation.

National Coils.

National Coil Co., Lansing, Mich.

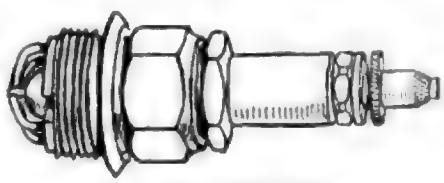
Spark coils of various designs and sizes for use with all types of ignition systems.

SPARK PLUGS.

V-Ray Spark Plugs.

Illinois V-Ray Sales Co., Chicago, Ill.

Models—Eight models, four of which are



V-RAY "CHAMBERLESS"

in A. L. A. M. standard. A special mica racing type also is made. Breech-block plugs are made in two models in both mica and porcelain. Umph timers are made for one-, two-, three- and four-cylinder motors.

Features—Spitfire plugs have a closed base which serves as an electrical condenser, protects the electrodes and heats the mixture in the chamber; Breech-block plugs have a core which is separated from the shell simply by turning a handle a quarter turn.

Prices—Spitfire plugs, from $1.50 to $3.50; Breech-block plugs, from $1.50 to $2.95. Umph timers, one-cylinder, $4; two-cylinder, $4.50; three-cylinder, $4.75; four-cylinder, $5.

A-C Plugs.

Champion Ignition Co., Flint, Mich.

Models—Made in eight models. No. 1 Standard, No. 1 long, No. 2 special for Ford cars, No. 3 short for motorcycles, and W. P. water proof, with a priming cup attachment, with acetylene engine starter check

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valve, and with an acetylene gas priming inlet without the check valve, the W. P. being a recent addition to the line.

Features—Method of mounting the porcelain with a brass and a tapered steel washer, besides the copper asbestos washer to insure a gas-tight joint.

Prices—Standard, long, short and Ford models, $1; W. P., with priming cup, and with gas attachments, $1.25.

Mac-Kae Blitz Plugs.

Randall-Faichney Co., Boston, Mass.

Models—Made in ½-inch, ⅞-inch and metric sizes.

Features—Double insulation construction, mica tube surrounding central electrode and porcelain shell surrounding the whole. Oil soaking into the mica cannot affect the insulation and a breakage of the porcelain need not incapacitate the plug.

Prices—All sizes, $1.

Sootproof Spark Plugs.

C. A. Mezger, New York City.

Models—Made in a variety of models and sizes to fit all motors and suit all conditions.

Features—Double chamber with large area and the very thin electrodes work to prevent the formation of carbon at points where it can short-circuit.

Price—All models, $1.

Red Head Spark Plugs.

Emil Grossman Co., New York N. Y.

Models—Made in four models—Regular, with porcelain insulator, Combination, with combined porcelain and mica insulator, Priming, with a priming cup attached to the shell, and Platinum Point, with electrodes tipped with platinum.

Features—Ample firing chamber to prevent carbonization; flexible cone under bushing to distribute pressure evenly. Priming plug injects gasolene directly over the electrodes. Platinum point plug is made to withstand the very hot spark of a magneto.

Prices—Regular, $1; Combination and Priming, $1.50; Platinum point, $2.

Splitdorf Plugs.

Splitdorf Electrical Co., Newark, N. J.

Models—Made in a single model, in sizes suitable for all motors.

Features—Mica insulation surrounded with a porcelain cap for protection from moisture.

Prices—½-inch, $1; other sizes, $1.25.

J-D Spark Plugs.

Jeffery-Dewitt Co., Detroit, Mich.

Made in a variety of sizes and models; especial attention is given to the Visable, which incorporates a supplementary gap in the body of the plug.

Features—Durability.

STORAGE BATTERIES.

Exide Batteries.

Electric Storage Battery Co., Philadelphia.

Exide, Hycap-Exide, Ironclad-Exide, Thin Plate, Chloride and Tudor batteries are made. The Hycap and Ironclad and Thin Plate models are intended primarily for electric vehicle use.

Features—Light weight, durability, efficiency.

Vesta.

Vesta Accumulator Co., Chicago, Ill.

Models—One model electric lighting system.

Features—The Vesta generator is of the permanent magnet-electro-magnet type in which current control is obtained by a centrifugally operated rheostat which automatically inserts resistance in the field windings. Storage batteries and a variety of lamps also are produced.

LBA Batteries.

Willard Storage Battery Co., Cleveland, O.

Models—Made in a variety of different forms and sizes, special attention being given to batteries for use in connection with lighting and starting systems.

Features—Pure Para rubber jars; four-plate supports of hard rubber; expansion chamber to take care of volumetric changes of solution during charge and discharge; durability and efficiency.

Philadelphia Storage Batteries.

Philadelphia Storage Battery Co., Philadelphia, Pa.

Storage batteries in various sizes and types for all classes of service.

Gould Storage Batteries.

Gould Storage Battery Co., New York City.

Made in various sizes and types for motor vehicle work.

Gasolene Motors

Motors, like complete cars, have made their greatest strides in matters of detail, and the measure of the improvements so made may be said to be the number of engines installed in cars, both pleasure and commercial—and the number is something surprising. The undoubted advantages of the block-cast four-cylinder motor have taken a strong hold, and a number of fine examples of the type are produced, as well as "sixes," which are helping the car makers to meet the insistent call for those models. The practice of casting on crankcases magneto brackets on which practically any magneto can be secured has been followed, logically, by the provision of means for attaching electric lighting and starting dynamos and motors, as well as driving means and casings.

In addition to the motors that have become familiar, there are two that are novelties of a striking sort, to say the least. One is the Scott, which is an ingenious "shot" at the turbine idea, and the other the Magic, which has crescent-shaped sliding valves let into grooves cut into its cylinder walls, and which is credited with amazing power. Another motor that is "different," though not unfamiliar, is the Church, while the "old liners" — Continental, Rutenber, Buda, Model, Waukesha, Northway—are looking better and doing better and are offered in greater variety than ever.

Rutenber Motors.

Rutenber Motor Co., Marion, Ind.

Four-cylinder and six-cylinder motors; five models. Model 27 is a four-cylinder block-cast motor, 3¾ x 5¼ bore and stroke, L-head type; built in three styles—standard crankcase with outside flywheel, unit power plant type, and unit type with drive and housing for electric lighting dynamo. Model 28, six-cylinder, bore and stroke 3¾ x 5¼ inches; L-head type. Made in both standard and unit types. Model 29 has cylinders 4¼ x 5¼ inches bore and stroke. Model RA has 4½ x 5 bore and stroke; 32 horsepower; L-head type.

Features—All valve mechanism closed; high grade construction throughout; different crankcase styles to suit different needs; flywheels made to take either disk or cone clutches. Models 27 and 28 are new models.

Buda Motors.

Buda Co., Chicago, Ill.

Models—Seven models, all four-cylinder, block-cast, L-head motors with enclosed valve mechanisms. The dimensions of models T, TM-3 and TM-4 are identical and stand at 4¼ and 5½ inches for the bore and stroke, respectively. Model M, which is put out especially for truck use and is provided with a governor, has a bore and stroke of 3¾ and 4½ inches. Model N, which is especially adapted to take Ward Leonard electric lighting system and which is furnished with either pump or thermo-siphonic circulation, has a bore and stroke of 4⅛ and 5¼ inches. The construction of model

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O, which is dimensioned at 4⅛ and 5½ inches, also embraces the use of a governor. Model Q is a long stroke type with bore at 3⅛ inches and stroke 5½ inches. Models T, TM-3 and TM-4 all have bores and strokes of 4¼ and 5½ inches, respectively; T embraces the use of a pump for effecting the circulation of the cooling water; with both the others either system can be adapted. TM-3 and TM-4 differ only in that the former is made with supports for three-point suspension, while the latter is provided with four supporting points. Models Q, O and T motors also are put out in unit power plant form, the clutch casing to which is attached the gearset being bolted to the crankcase. In combination, the plants are known as models QU, OU and TU.

Features—Clean-cut design, accessibility and adaptability.

Model Motors.

Model Gas Engine Works, Peru, Ind.

Models—Made in five models: Four are 4-cylinder motors and have bore and stroke dimensions of 3½ x 4½ inches, 3⅝ x 4½ inches, 4¼ x 5 inches, and 4¼ x 5½ inches, respectively; the fifth model is a six-cylinder motor, with bore and stroke at 4¼ x 5½ inches, respectively. Any of the motors can be had in unit power plant form, if desired.

Features—Cylinders cast separately; L-head type, with the valve mechanism enclosed; five-bearing crank shaft; cam shaft formed with cams integral; domed pistons; oil return grooves on the pistons; spiral cut gears running in oil; constant level splash lubrication.

Continental Motors.

Continental Motor Mfg. Co., Detroit, Mich.

Models—New Model 6-C has cylinders measuring 4⅛ x 5¼, cast in pairs, rated at 45 horsepower. Put out in unit power plant, fitted with a dry multiple disk clutch and either three- or four-speed gearset.

Features—Valves all on right side for use in connection with left-hand steer cars; designed with supports suitable for the accommodation of all types of engine starters; three-point suspension, oiler on pivot support.

Magic Motors.

Aristos Co., New York City.

Models—Made in a single model with four block-cast cylinders measuring 85 x 120 mms. bore and stroke.

Features—Motor is of brand new and unique design throughout. The valves are crescent shaped and operate in similarly shaped spaces between the piston and the piston wall, inlet and exhaust valves being positioned on opposite sides of the cylinder. The valves are operated from the camshafts through the intermediary of box cams which permit of lag in the operation save at times when the valves are being opened or closed. Combined force feed and splash lubrication; separable cylinder heads all four cast in a block.

Scott Turbines.

Semple S. Scott, Chicago, Ill.

Models—Made in three models, 40-, 60- and 120-horsepower and designed for attachment to any make of motor car.

Features—Light weight, high efficiency, simplicity, no valves or springs, no muffler.

Prices—$400, $500 and $600 for the respective sizes.

Church Pneumatic System.

Automatic Motor & Engineering Co., Chicago, Ill.

Motors and transmission elements in several sizes and types.

Features—Pneumatic clutch and transmission.

Northway Motors.

Northway Motor & Mfg. Co., Detroit, Mich.

Gasolene motors of latest type for both pleasure and commercial vehicles.

Waukesha Motors.

Waukesha Motor Co., Waukesha, Wis.

Gasolene motors of latest type for use in commercial and pleasure cars.

Signaling Devices

Almost strangely enough, most of the manufacturers of bulb horns report that their outputs have suffered no shrinkage, despite developments, so far as horns are concerned, have been confined wholly to the signalling devices, and, if the underhood type is excepted, the developments are chiefly matters of size and price. A small horn at a relatively popular price has been added to practically all of the better known lines. And that the field is an attractive one is indicated by the entry into the business of several new manufacturers, the most recent and most notable of them being the Sparks-Withington Co. of Jackson, Mich., whose "Sparton" horn will be displayed for the first time. Sparton signals are of motor driven type.

Klaxon Signals.

Lovell-McConnell Mfg. Co., Newark, N. J.

Models—Klaxon made in two models, known as Type L and Type S, both embracing right angle construction—that is, with the motor set so that the cam rotates at right angles to the diaphragm. Type L is fitted with a long projector; Type S has a short one. Combination Klaxon is similar to Type L save that a bulb horn enters into combination with it. Klaxonettes, which are a smaller and less costly edition of the Klaxon also embrace the use of a motor which, however, is housed in the casing behind the diaphragm; similarly are made in two models with long and short projectors known as Models L and S, respectively; a combination Klaxonette also is produced. The Klaxet, which is the newest addition to the Lovell-McConnell line of warning signals, is similar to the Klaxonettes; the parts, however, are smaller and lighter. But one model is built.

Features—Motor driven; distinct, penetrating sound.

Prices—Finished in brass, black enamel, black enamel and brass or nickel, Model L Klaxon, $35; Model S, $30; Combination Klaxon, $50; Model L Klaxonette, $20; Model S, $20. Combination Klaxonette, $30. Finished in all nickel or gun metal the prices are $38, $32, $55, $22, $22 and $33 for the respective signals. The Klaxet finished in black enamel or black enamel and brass or nickel sells for $12.

Tuto and Rexo Signals.

Dean Electric Co. Elyria, Ohio.

Models—Tuto signals made in two models, with long and with short projector, the mechanism in each case being identical. Tutoette horns are slightly smaller and lighter than the Tuto models; the mechanisms are similar. Like the Tuto, Tutoette signals are built in two models, with long projector and with the short projector. The Rexo horn is made in one size only and differs from the other models in that it is smaller and produces but a single tone.

Features—Tuto and Tutoette horns are capable of emitting two tones—loud and subdued—at the will of the operator. All are operated by electro magnetic vibrators.

Prices—Tuto with either long or short projector and finished in brass, nickel, black enamel or black enamel and brass or nickel, $25. Tutoette, with either long or short projector, in brass, $17.50; in nickel, black enamel or black enamel and brass or nickel, $18.50. Rexo horn, $10, finished in black enamel with nickel trim.

Newtone Signals.

Automobile Supply Mfg. Co., Brooklyn.

Models—Newtone signals: Made in five models. Type M has a long projector with a flared end; Torpedo has a similar mechanism with a torpedo projector; Type N has a short, flared projector; Combination

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has a bulb horn combined with a torpedo electric; Superior is constructed of lighter materials. Also Rubes bulb horns, made in 17 models of various sizes and shapes.

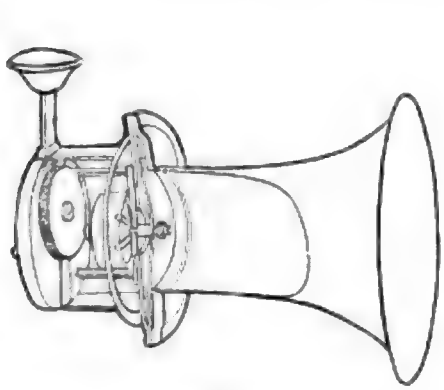
Features—Electric motor drive; loud, penetrating sound emitted by virtue of the motor-vibrated diaphragm; low current consumption; accessibility. Rubes bulb horns are fitted with non-corrodable reeds.

Prices—Type M, $20; Torpedo, $20; Type N, $18; Combination, $30; Superior, $10. Bulb horns from $1.25 to $5.

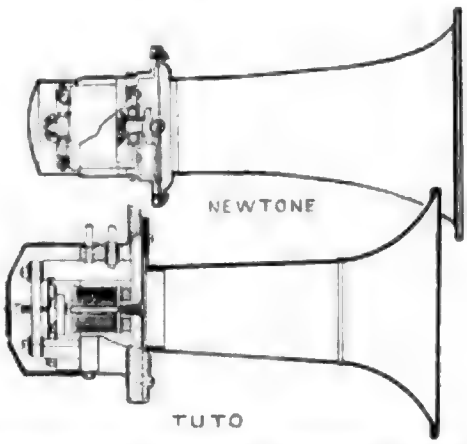
Long Horns.

G. Piel Co., Long Island City, N. Y.

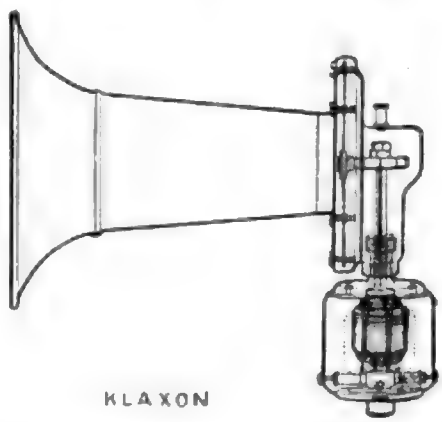
Models—Made in three models; Model S for attachment to the side of the car; Model D for attachment to the dash, and the Junior, which is similar to Model S, but smaller.



LONG HORN



TUTO



KLAXON

EXPOSING THE INSIDES OF FOUR OF THE BEST KNOWN WARNING SIGNALS

Features — Mechanically vibrated diaphragm type; operated by the pressure of the hand on a button. Vanadium steel diaphragm is corrugated to prevent rupture. Teeth of the cam are rotatable rollers, reducing wear. New dashboard model can be attached to any convenient portion of the car.

Prices—Model S, in brass or black enamel, $18; nickel, $20; Model D, in brass or black enamel, $19; nickel, $21; Junior, in black enamel, $19; nickel, $21; the Junior is furnished in brass or black enamel and sells for $11.

Jericho and Jubilee Horns.

Randall-Faichney Co., Boston, Mass.

Models—Made in two types for attachment at the rear of the muffler where permissible and for attachment to a three-way valve, which takes the place of a muffler cut-out. The rear-of-the-muffler type is made in seven sizes—Nos. 0, 1, 2, 3, 4, 23 and 24. Two sizes only of the cut-out signal are made—No. 2 for cars below 25 horsepower and No. 3 for cars above 25 horsepower.

The Jubilee horn is similar in design, save that the resonating chamber present on the Jericho horn is supplanted by a pair of brass pipes tuned so as to give a mellow chime. The Jubilee is made in four sizes—Nos. 31, 32, 33 and 34.

Features—Standard threaded pipe fittings which can be had with the horns, or special clamp fittings which are regularly supplied reduce the labor of attachment to a minimum. Large passages militate against choking. Pleasing mellow tone.

Prices—Rear-of-Muffler type Jericho: No. 0 and No. 1, $7; No. 2, $8; No. 3 and No. 23, $9; No. 4 and No. 24, $10. Cut-out type: No. 2, $7; No. 3, $8. Jubilee: No. 31 and No. 32, $8; No. 33, $9; No. 34, $10.

Sparton Signals.

Sparks-Withington Co., Jackson, Mich.

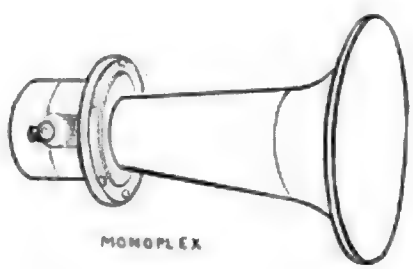
Models—Made in two models, both motor driven. The dash type is 12 inches long and has a flared bell 7½ inches in diameter; the under-the-hood type is similar as to mechanism but is not fitted with a flared bell and is slightly shorter.

Features—Loud and piercing, but not distressing tone; specially designed commutator; laminated armature and field piece.

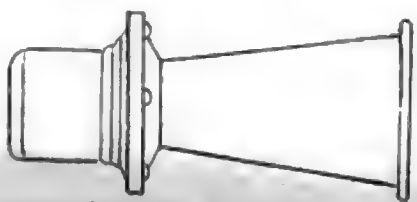
Monoplex Signals.

Atwater-Kent Mfg. Works, Philadelphia, Pa.

Models—Made in two models with identical mechanisms, but with projectors of different lengths. Model A is fitted with the long projector. Model M is the short model.



MONOPLEX



SPARTON ELECTRIC

Features—Electro-magnetic vibrator type with but a single moving part in the shape of an armature; heavy contacts; simple adjustment.

Prices—Model A finished either in black enamel and brass, black enamel and nickel or all black enamel, $15; Model M finished in the same manner, $12. Prices include all necessary fixings.

Riley-Klotz Horns and Whistles.

Riley-Klotz Mfg. Co., Newark, N. J.

Models—Bulb horns are made in 30 models, which differ from each other in the shape of the horns and bells as well as in size. The largest has an eight-inch bell. An under-the-hood model, 21 inches long, is among the newer designs. The Nightingale exhaust whistle is made in three sizes for automobile use, for cars up to 35 horsepower, for cars from 36 to 80 horsepower and for cars over 80 horsepower.

Features — Loudness; non-corrodable reeds; durability.

Prices—From 1.50 to $6. Nightingale whistles, $7.

Gabriel Exhaust Horns.

Gabriel Horn Mfg. Co., Cleveland, O.

Models—Single tube horns made in four sizes, 25, 28, 32 and 34 inches long, respectively. Trumpet horns with four tubes made in two sizes with 28- and with 32-inch tubes. The Musical Wonder, with 10 tubes, also is made in small and large sizes.

Features—Mellow chord; simple installation.

Prices—Single tube, 25-inch horn, $15; 28-inch, $18; 32-inch, $25; 34-inch, $35. Trumpet, small, $75; alrge, $80. Musical Wonder, small, $175; large, $200.

Nonpareil Bulb Horns.

Nonpareil Horn Mgf. Co., New York City.

Models—Made in a variety of sizes and shapes for attachment either to the dash or under the hood.

Carburetters

With the "rising generation," if the term be pertinent as a designation for manufacturers of carburetters of new design, a marked tendency exists toward producing multiple jet carburetters with jets numbering from two all the way up to about twenty, in an effort to obtain constancy of mixture. Those who are longer in the field, however, and whose products have become standardized, still hold to the employment of a single or, at most, two jets, and not in all cases is the fuel opening varied according to the throttle opening as a means of obtaining that ever to be desired constancy of mixture.

For the most part, improvement in carburetters has been along lines designed to render simple and convenient the adjustments of those parts which, in all save a few instances, it has been found needful or advisable to make adjustable; to this end provision for dash control of either the mixture valve or the auxiliary air inlet has become almost universal. Apart from the consideration of convenience, an effort to secure greater fuel economy is the natural result of the practice for adjustments which make for better working conditions can be made under running conditions.

Verging on the radical and also on the mysterious, since the situation will not permit reference to its construction, is the creation which marks the entrance of the Motsinger Devices Co., of Lafayette, Ind., into the realm of carburetter manufacturers, and which will be exhibited for the first time at the New York show. Though details are lacking, its makers assert that it can be proven that not only are fuel and air proportions invariable under all conditions of motor speed and work delivered, but that the carburetter is so economical that it will be sold with a guarantee of more miles per gallon than is possible with any other device. That newer ideas are incorporated in the device is indicated by the fact that the single adjustment which is carried to the dash or steering column is for temperature changes.

Other departures from well beaten paths are noticeable in the Feps carburetter, product of Schoen-Jackson Co., Media, Pa., in which the use of springs, cams and balls has been disregarded and in which the high speed jet is rendered operative at the correct time by the suction of the motor as evidenced by its action on the auxiliary air clack valve which has to do with the opening of the second jet, and in the near-startling arrangement of the float chamber in the A. B. C. carburetter, so that it is tilted as the throttle is opened and thereby the lower ends of the high speed jets are immersed and rendered operative. The device is made by the International Accessories Mfg. Co. of New York City. In both cases, however, the newer ideas appertain only to the mechanical arrangements whereby certain results are obtained and not to new basic principles or theories.

Just one other point is of sufficient importance to be included in the "tendency" class—the leaning of carburetter manufacturers toward the practice of supplying outside heat through the intermediary of a jacket around the mixing chamber for connection either with the cooling system or with the exhaust. This method of supplying heat has almost wiped out the practice of obtaining heated air from a jacket around the exhaust manifold.

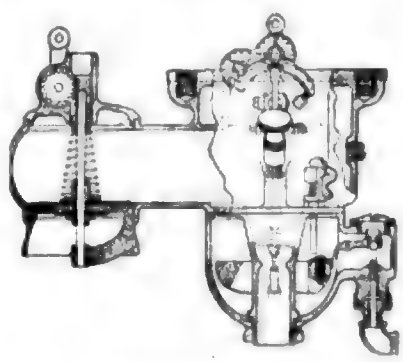
Schebler Carburetters.

Wheeler & Schebler, Indianapolis, Ind.

Models—Made in six models, known as D, E, F, H, L and O. Model D has a slide-poppet throttle valve, a needle valve which is used on all speeds, and a single air inlet valved with a spring controlled clack valve around which a by-pass leads for providing extra low speeds. Model E is similar, save that a separate low speed air inlet is provided. Model F embraces the use of a low and a high speed air passage, a butterfly throttle valve and a needle valve which is provided with two adjustments, for high and for low speeds, the needle being raised and lowered by an adjustable cam on the throttle spindle. It is also provided with a hot water jacket around the mixing chamber. Model H is similar, but is of the horizontal type and is not jacketed. Model L, also horizontal type, is provided with an adjustable cam on the throttle shaft for varying the needle valve as the throttle is opened. It is jacketed with a jacket around the mixing chamber for the exhaust gases; it can be provided with a needle valve adjustment which is operated from the dash. Model O is provided with a graded jet which comes into operation when the car has attained a speed of twenty miles an hour and with a shut-off in the low speed air passage which is linked to the throttle stem so that it is closed as the throttle is opened; a butterfly valve positioned in the intake pipe for the hot air jacket serves to regulate the temperature of the mixing chamber.

Features—Constancy of mixture, ease of adjustment, economy of fuel, freedom from back-firing, choking and flooding; flexible.

Prices—Model D, ½-inch $13, ¾-inch $15, 1-inch $16, 1¼-inch $17, 1½-inch $22, 2-inch $44; Model E, ½-inch $13, ¾-inch $15, 1-inch $17, 1¼-inch $19, 1½-inch $30, 2-inch $50; Model F, 1-inch $18, 1¼-inch $20, 1½-inch $25, 1¾-inch $30, 2-inch $60, 2½-inch $80, 3-inch $100; Model H, ¾-inch $15, 1-inch $16; Model L, 1-inch $18, 1¼-inch $20, 1½-inch $25, 1¾-inch $30, 2-inch $60, 2½-inch $80. Model O prices are the same as for Model L.



SCHEBLER MODEL L

New Miller Carburetters.

New Miller Carburetter Co., Indianapolis, Ind.

Models—Made in a single model, five sizes from 1 inch to 2 inches.

Features—Springless; single jet; fuel passage controlled throttle opening.

Prices—1-inch, $14; 1¼-inch, $22; 1½-inch, $25; 1¾-inch, $30; 2-inch, $50.

Stromberg Carburetters.

Stromberg Motor Devices Co., Chicago, Ill.

Models—Made in four models, knows as A, B, C and G. A, B and C are of the single jet type; G, which is a new model, operates on the double jet principle, and is water jacketed.

Features—Non-corrodable metal used in the jets; removable venturi tube.

Prices—Model A, from $17.50 to $50; B, from $17 to $35; C, from $30 to $60.

Kingston Carburetters.

Byrne, Kingston & Co., Kokomo, Ind.

Models—Newest model, Y, is made in nine sizes from ¼ inch to 4 inches.

Features—Floating ball air inlet valve.

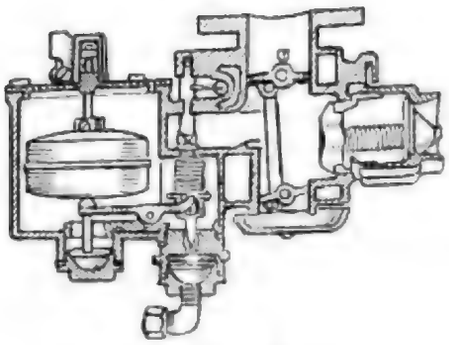
Prices—¼-inch, $8.25; 1-inch, $9; 1¼-inch, $9.75; 1½-inch, $10.50; 2-inch, $15; 2½-inch, $18.75; 3-inch, $40; 3½-inch, $48; 4-inch, $60.

Motsinger Carburetters.

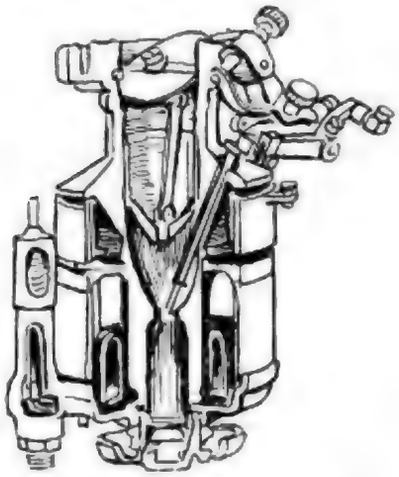
Motsinger Devices Co., Lafayette, Ind.

An entirely new model, the principles of which, however, cannot be disclosed because of patent arrangements, but which introduces into every foot of air passing into the motor an absolute predetermined proportion of fuel, regardless of the motor speed, opening of the throttle, or the load. The device has but one adjustment—for temperature—and this is controlled from

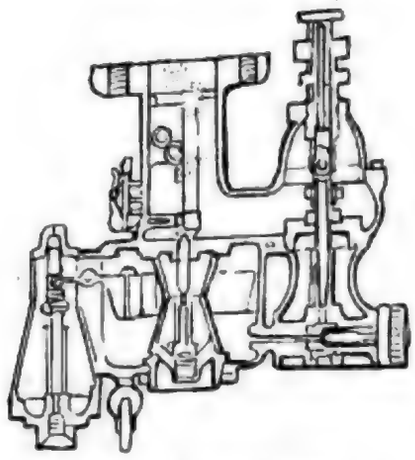
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RAYFIELD DOUBLE THROTTLE



SPRINGLESS NEW MILLER



DOUBLE JETTED FEPS

the dash. The device will be sold with a guarantee to afford more mileage per gallon than any other carburetter.

A. B. C. Carburetters.

International Accessories Mfg. Co., New York City.

Models—Made in a single model in all of the more common sizes.

Features—Float chamber tilts as the throttle is opened, permitting the level of the fuel to rise above the lower ends of the jets as the speed of the motor increass.

Rayfield Carburetters.

Findeisen & Kropf Mfg. Co., Chicago, Ill.

Models—Made in two models: Model D is water-jacketed and Model H is not water-jacketed; the models otherwise are similar. Model D is made in five sizes, increasing by quarters of an inch from 1¼ to 2 inches. The three larger sizes are provided with double jets. Model H is made in three sizes, 1, 1¼ and 1½ inches.

Features—Three air intakes; fixed, mechanically operated and automatic; three adjustments for low, intermediate and high speeds, which are easy to make; dash control ensures easy starting.

Prices—Model D, 1¼-inch, $30; 1½-inch, $35; 1½-inch, double jet, $37.50; 1¾-inch, double jet, $40; 2-inch, double jet, $45. Model H, 1-inch, $20; 1¼-inch, $22.50; 1½-inch, $25.

American Locomotive Carburetters.

L. V. Fletcher & Co., New York City.

Models—Made in four models, A, B, C and D. A has a single jet and is not water-jacketed and is made in six sizes from 1 inch to 2½ inches; Model B is similar, but with two jets. Model C is single jet and is water-jacketed; Model D is a double jet water-jacketed device.

Features—Simple adjustment; flexible.

Prices—From $15 to $38.

Feps Carburetters.

Schoen-Jackson Co., Media, Pa.

Models—Made in a single model and in all of the popular sizes.

Features—Double jet venturi tube type, the high speed jet being rendered operative by the suction of the motor on the auxiliary air inlet valve; springs, balls and cams eliminated.

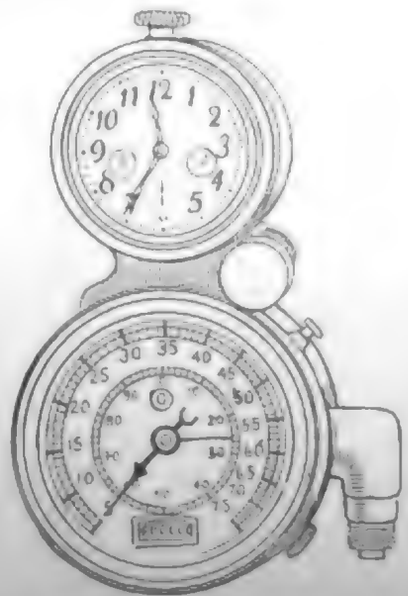
Homo Carburetters.

Homo Co. of America, Philadelphia, Pa.

Speedometers and Other Meters

Efforts to increase the legibility of the speedometer dial is a leading feature of the year's development. Both the Corbin Screw Corporation, which produces the Corbin-Brown speedometer at New Britain, Conn., and the Dean Electric Co., Elyria, Ohio, maker of the Elyria-Dean, are putting out instruments with dark faces and white numerals by way of avoiding reflections which interfere with the legibility of the dials; the Corbin corporation has also gone a step further and made the indicating figures which terminate in the figure 5 subordinate to those which terminate in zero and the advantage accruing therefrom is not to be minimized.

With manufacturers older in the field save in two instances, changes have been chiefly in the way of increasing the record of the season odometer readings, which in very nearly all cases now read to 99,999.9 miles, and of adding or perfecting trip odometer resets, so that the reading can be set to any tenth mile within the 100-mile scope; in a few instances improvements of a minor nature which have to do with the drive mechanism have been added, and in nearly all cases tendency to produce clock combinations both side by side and vertical is marked.



REVISED HOFFECKER DESIGN

Two complete changes of the external appearance of the lines have been effected, though in neither case have basic principles been changed for others. The Stewart & Clark Mfg. Co., which makes the Stewart magnetic speedometer at Chicago, Ill., has abandoned the use of the indicating needle in 15 of the 16 models in which the instrument is produced and substituted therefore the cylindrical scale with numerals which appear before a peep window. Other more or less innovative features have been adopted in the shape of a gradometer, which is supplied on several of the models, and a trip odometer reading up to 300 miles on one of the types. A micrometer adjustment which has to do with the accuracy of the device also has been added. The product of the Hoffecker Co., of Boston, Mass., has undergone several changes, chief among which are the adoption of a cylindrical form in place of the square casing which so long was adhered to, and the production of clock models in which Waltham timekeepers and electric dial lights are employed.

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Stewart Speedometers.

Stewart & Clark Mfg. Co., Chicago, Ill.

Models—Made in six types and sixteen models. Model A reads to 60 miles an hour, has season and trip odometers that read to 100,000 and 300 miles, respectively, a micrometer adjustment and electric light. A2 is similar, save that it reads to 100 miles an hour. Model B is similar save that the electric light is not provided, the trip odometer reads only to 100 miles and a gradometer is added, it reads to 60 miles. Model B2 reads to 100 miles. Model B5 is B with an electric light added; Model B6 is B2 with an electric light added. Types A and B have 4-inch dials. Type C instruments have 3-inch dials. Model C reads to 60 miles; C2 to 100 miles. In combination with clocks. Types A, B and C, all of which have rotary cylindrical dials, form Models A1, A3, B1, B3, B4, C1, and C3. Model E is 3½ inches in diameter and reads to 30 miles. Model F is an odometer only, it reads to 100,000 miles season and 300 miles trip. Model 26 has a 3-inch dial and is provided with a pointer.

Features—Magnetic type, micrometer adjustment; trip odometers on Type A read to 300 miles; gradometer incorporated in Type B; Seth Thomas clocks or Stewart clocks; odometer reset to tenths of a mile.

Prices—Model A, $75; A1, $125; A2, $75; A3, $125; B, $55; B1, $85; B2, $55; B3, $90; B4, $65; B5, $65; B6, $60; C, $25; C1, $45; C2, $30; C3, $45; E, $25; F, $15; 26, $20.

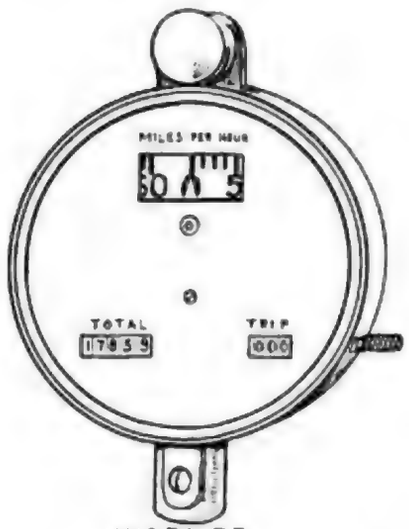
Standard Speedometers.

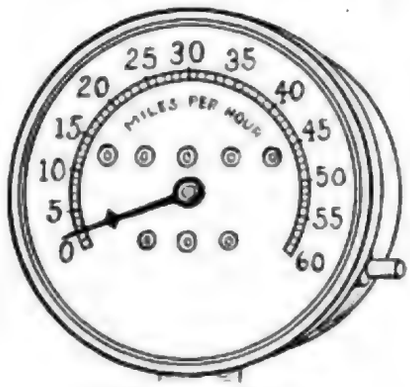
Standard Thermometer Co., Boston, Mass.

Models—Apart from combinations with watches and clocks, seven different models are made, four of which are provided with three-inch dials and indicate, respectively, 30, 50, 60 and 80 miles an hour; the other three embrace the use of 4-inch dial mechanism, which differ from each other slightly in the arrangement of the scale, read to 60 miles an hour, and the third to 80. On all models the season odometer registers 9,999.9 miles and the trip odometer registers 99.9 miles. Any of the 3-inch models enters into combination with a watch to form new models, and the 3-inch 60-mile model goes with either a Boston or a Chelsea clock to form a side-by-side small model which is fitted with an electric light. A large side-by-side model also is formed by the combination of the four-inch 60-mile speedometer with a 4-inch Boston or Chelsea clock, and a vertical model.

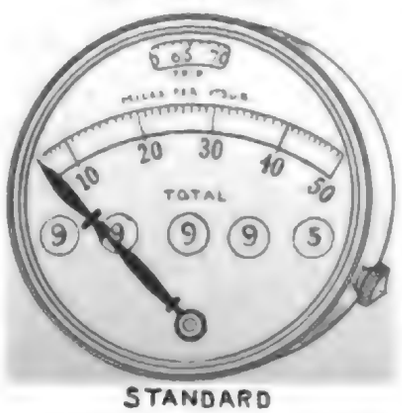
Features—Centrifugal force type, with large figures on the trip odometer.

Prices—Three-inch models with scales reading up to 60 miles, $25; 3-inch, 80 miles, $30; 4-inch, 60 miles, $35 and $50; 4-inch, 80 miles, $40; 3-inch watch combination, $30; 4-inch vertical clock combination with Boston clock, $75; with Chelsea clock, $85; small side-by-side combination with Boston clock, $55, with Chelsea clock, $65; large size side combination with Boston clock $70, with Chelsea clock, $80.









Corbin-Brown Speedometers.

American Hardware Corp., New Britain, Conn.

Models—Made in eight models, which combine with Chelsea clocks to form eight combination models. Model A is 3 inches in diameter, indicates to 60 miles an hour, and is provided with season and trip odometers reading to 9,999.9 and 99.9 miles, respectively; the latter is provided with a reset. Model B is similar, with a 4-inch dial. Model C is the same as B, save that a maximum hand is provided. On Model D an electric light also is provided. Model E is similar to Model B, save that it indicates to 80 miles an hour. Model F indicates to 80 miles and has the maximum hand; Model G also reads to 80 miles and has maximum hand and electric light. Model H is similar to Model G, save that it indicates up to 100 miles an hour.

Features—Centrifugal force instrument, four weights on the governor. On the dial, the multiples of 10 are made twice the size of the other figures to facilitate reading. Either black or white dials are supplied.

Prices—Model A, $25; Model B, $30; Model C, $35; Model D, $40; Model E, $50; Model F, $55; Model G, $60; Model H, $80. In combination the respective prices are $65, $70, $75, $80, $90, $95, $100, and $120, finished in polished brass. In nickel the price is $2 higher.

Hoffecker Speedometers.

Hoffecker Co., Boston, Mass.

Models—The newest product, Model L, indicates up to 75 miles an hour and is combined with an eight-day Waltham clock positioned above the speedometer dial. The season odometer reads up to 99,999.9 miles and repeat; the trip odometer, which is fitted with a circular dial and a pointer, reads up to 99.9 and repeat and is provided with a reset. A cylindrical casing has been adopted instead of the square casing and an electric light added. The compound centrifugal governor is retained.

Features—Governor requires no compensating springs; individually graduated; large figures facilitate reading; jars are absorbed within the instrument; durable.

Warner Autometer.

Warner Instrument Co., Beloit, Wis.

Models—Produced in six models, which enter into combinations with clocks and electric lights to form 10 combination models. Models R and S are cylindrical in form with the numerals on a cylindrical scale, which also obtains in other models; R reads to 60 miles an hour. S indicates to 100 miles an hour. Odometers register to 9,999 and 99.9 miles, respectively, for the season and trip. Models K-2 and L-2 embrace the use of the same speed indicating members as models R and S, but they are disposed beneath a circular disk through which the season and trip odometer scales

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which read to 999,999 and 999.9 miles, respectively, also protrude. Hooded electric lights are fitted to both models, which are 4½ inches in diameter. Model K-2 indicates speed up to 60 miles an hour; L-2, up to 100 miles an hour. Models 30, 31, 32 and 33 all are 3½ inches in diameter and are new additions to the Warner line. The latter two are similar, respectively, to Models 30 and 31, save that electric lights are fitted. Model 30 indicates up to 60 miles an hour and 31 up to 100; on all four the season and trip odometers read to 99,999 and 99.9 miles, respectively, the trip odometers being provided with a reset which also can be set so as to render the recorders inoperative. Models R and S form combination models S and T with a 3⅛-inch Chelsea clock mounted on the top of the cylinder. Models K-2 and L-2 similarly form Models M-2 and N-2, while with the clock 4⅝ inches in diameter mounted side by side they form Models O-2 and P-2. Models 30 and 31 combined side by side with a Chelsea clock of similar diameter form Models 34 and 35.

Features — Magnetic drag principle; large figures appearing before a sight hole being placed on the side of the aluminum cup, which is perfectly balanced by way of insuring steadiness and accuracy.

Prices—Model R, $50; S, $60; T, $90; U, $90; in either brass or nickel. Model K-2, $75; L-2, $85; M-2, $125; N-2, $125; O-2, $145; P-2, $145, in either brass, nickel or black enamel or special finishes. Models 30 and 31, $50; 32 and 33, $55; 34 and 35, $90.

Elyria-Dean.

Dean Electric Co., Elyria, Ohio.

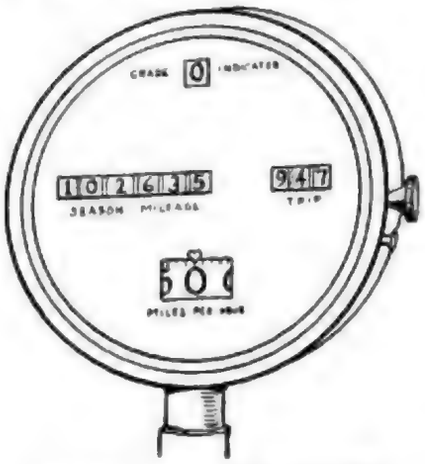
Models—One model with a 5-inch dial, speed indication up to 60 miles an hour, distance indication on the season odometer up to 99,999.9 and on the trip odometer, which is provided with reset, to 99.9. Case and dial both are black with the hands and numerals in nickel. Centrifugal force principle employed, the governor comprising four balls which lift a cage operating needle when shaft is revolved.

Features—Large numerals and blackened dial make for easy riding. Shape of the faces of the cage in contact with the balls insures accuracy without the use of compensating means and permits of the use of a uniform scale. Springs are eliminated from the make-up of both season and trip odometers.

Veeder Tachodometers.

Veeder Mfg. Co., Hartford, Conn.

Models—Tachodometer or speedometer is made in two models, both of which read up to 60 miles an hour, but which differ in that one is fitted with an odometer which registers mileage regardless of the direction of movement of the vehicle, the converse is true of the other. In both cases the odometer reads to 9,999.9 for the season and



STEWART WITH GRADOMETER

99.9 miles, respectively; the trip scale can be reset.

Features—Tachodometer is of liquid centrifugal force type. Two scales are provided, one reading up to 60 miles an hour and the other, for more accurate readings, reads up to 30 miles an hour.

The hub odometer can be attached to the wheel without the necessity of making any changes whatever in the axle end. Both Model B and Model D odometers are furnished with a pressed steel pinion of novel contour, which reduces the friction and noise and is self-cleaning.

Prices—Tachodometer with irreversible odometer, $50; with reversible odometer, $55. Hub odometer, $25; Model B, $10; Model D, $20. Prices include all fittings.

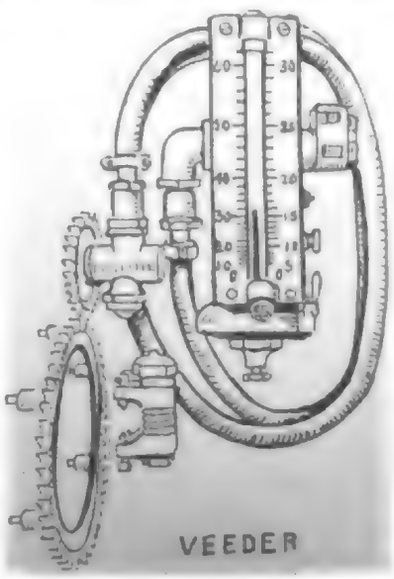
Servis Records.

Coronet Hub Odometers.

Service Recorder Co., Cleveland, O.

Models—Servis Recorders made in a single model. Coronet Hub Odometers are made to fit in place of the hub cap.

Features—Recorder requires no connection with the wheel; it records the movement of the vehicle by means of the oscillations imparted to a pendulum when the vehicle is in motion. The pendulum carries a stylus which marks a revolving chart moved by a chronometer incorporated in the instrument. The device is "tamperproof." The hub odometer likewise attaches without any connection to the axle. The motion is imparted to the train of gears which moves the recording wheels by means of a pendulum which remains stationary as the odometer revolves.



Jones and Popp Taximeters.

American Taximeter Co., New York City.

Models—Jones Taximeters: Made in two models; A is arranged so that the "extra" tariff is added to the total fare reading; on B the fare and the "extras" are shown separately. Popp Taximeters: Made in two models for recording either a single tariff, where but one person is carried, or two tariffs, where more than one passenger is carried.

Features—Cannot be tampered with; accurate; easily attached without injury to car.

Prices—The instruments are rented, not sold. The rental is $6 a calendar month for each instrument up to 25; $5 in lots from 26 to 100, and $4.50 in greater quantities than 100. A deposit of $30 is required on each instrument.

BUMPERS.

Conover Safe Guards.

Lovell-McConnell Mfg. Co., Newark, N. J.

Models—Built in two sizes, with bumper bar either 2 or 2¾ inches in width. With 2-inch bar, the device is made either in steel with an enamel finish, or in steel with a brass or nickel-plate finish, or in solid bronze with brass or nickel-plate finish; in the larger size, the device is made only in bronze.

Features—Channel section bar, semi-elliptic steel leaf springs bearing at four points to relieve the shock.

Prices—In steel, 2-inch bar, enamel finish, $15; brass or nickel-plate finish, $17.50; in bronze, brass or nickel-plate finish, $25. In bronze, 2¾-inch bar, brass or nickel-plate finish, $25.

Hartford Bumpers.

Hartford Suspension Co., Jersey City, N. J.

Models—Made in three sizes, for cars of over 3,000 pounds, for cars of between 1,500 and 3,000 pounds, and for cars lighter than 1,500 pounds; a model especially adapted for use on Ford cars also is manufactured.

Features—Attach without the necessity for drilling holes in the car frame; four-leaf friction spring absorbs the jar.

Prices—For heavy cars, $20; medium cars, $16; for light cars, $12; for Ford cars, $12.

Sager Bumpers.

J. H. Sager Co., Rochester, N. Y.

Models—Made in eleven models. The

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Diamond and the Protection are similar in the mode of attaching with a special spring shackle bolt, and in the disposition of the helical springs which oppose the movement of the bar; the Diamond, however, has a brass bar reinforced with steel which is rectangular in cross-section; the Protection has a round bar with wood filler. Both are made in five different finishes. The Universal Universal Channel and Universal Diamond all can be attached without drilling holes in the frame; the helical springs are concealed in the telescopic bracket which supports the bar. The Universal has a round steel bar, Universal Channel a channel bar and the Universal Diamond a rectangular bar; each is put out in four finishes. The Fit-all bumper is also of the Jumpon type and is adapted to fit all

$17; nickel, $17. Packard, nickel, $20. Ford, black enamel, $10; brass, $12.

E. G. Bumpers.

Emil Grossman Co., New York City.

Models—Made in eight models—with 1¼-inch tube bar, with 2-inch tube bar, with 2-inch channel bar, Swivelaction, Commonsense, Ford Bolt-On and Ford Clamp-On, and Cadillac Clamp-On.

Features—Strength and ease of application. Can be adjusted to fit nearly all cars. All have helical springs in telescoping tubes.

Prices—1¼-inch bar: Black enamel, $6.75; brass, $7.50; nickel, $9. Two-inch bar: Black enamel, $10; brass, $12.50; nickel, $15. Channel bar: Black enamel, $10; brass, $12.50;

to any make of car, and Ford, exclusively for Ford cars.

Features—Attachment effected without drilling the frame; channel bar can be straightened when bent; helical springs enclosed in telescoping tubes.

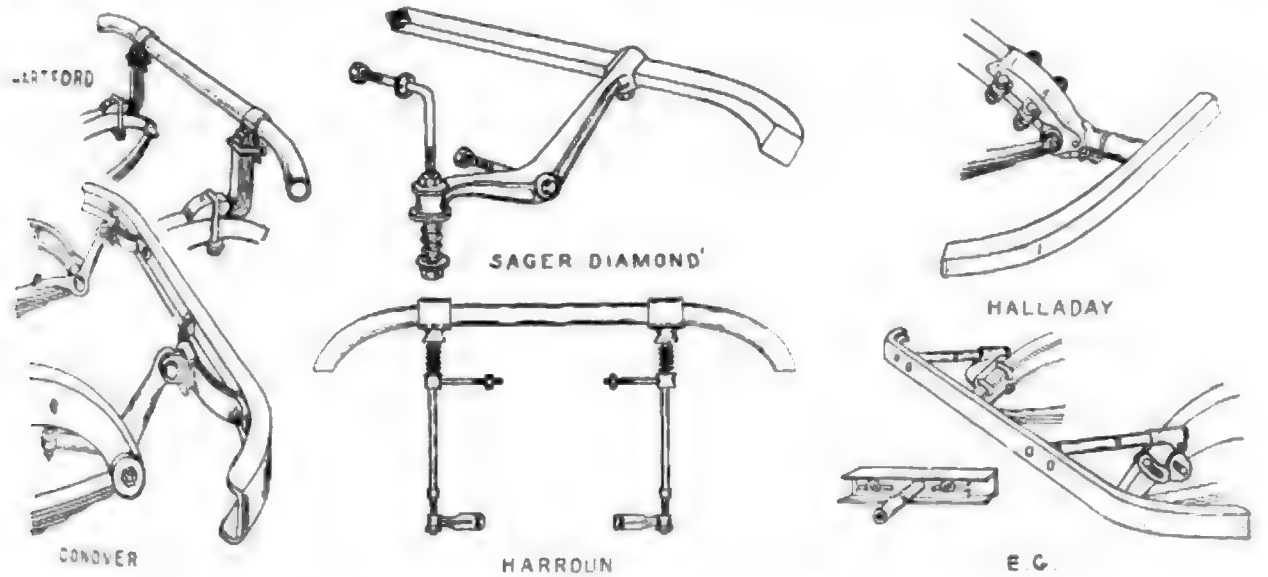
Prices—Imperial: Black enamel, $15; brass, $20; nickel, $20. Universal: Black enamel, $12; brass, $15; nickel, $15. Ford: Black enamel, $10; brass, $12; nickel, $12

SHOCK ABSORBERS.

Connecticut Shock Absorbers.

Connecticut Telephone & Electric Co., Meriden, Conn.

Models—Made in two models, for heavy and for light cars. The heavy type fits near-



BUMPER DEVELOPMENT—SOME OF THE MORE PROMINENT DEVICES

save the Ford; it is made in different finishes. Simplex, Simplex Diamond and Simplex Diamond all are clamp on and have concealed The Simplex has a round steel bars have channel and diamond respectively. The Packard Special the Ford Special bumper are special use with these cars supplied without resorting to

Features—Durability, adaptability and attachment.

Prices—Diamond, black enamel, $20; $25, nickel, $27.50. Protection, black enamel, $15; brass, $20; nickel, $22.50. Universal, black enamel, $10; brass, $12; nickel, $12. Universal Channel, black enadel, $12; brass, $14; nickel, $14. Universal Diamond, black enamel $15; brass, $17; nickel, $17. Fit-all, black enamel, $7.50; brass, $9.50; nickel, $9.50. Simplex, black enamel, $10; brass, $12; nickel, $12. Simplex Channel, black enamel, $12; brass, $14; nickel, $14. Simplex Diamond, black enamel, $15; brass, nickel, $15. Swivelaction: Black enamel, $7.50; brass, $8.50; nickel, $9.50. Commonsense: Black enamel, $5.50; brass, $6.50; nickel, $7.50. Ford Bolt-On: Black, $5.50; brass, $6.50; nickel, $7.50. Ford Clamp-On: Black enamel, $6; brass, $7; nickel, $8. Cadillac Clamp-On: Round bar, black enamel, $6.75; channel bar, $10; brass, $7.50; channel, $12.50; nickel, $9; channel, $15.

Harroun Bumpers.

Turner Brass Works, Sycamore, Ill.

Models—Made in a single model to fit all cars.

Features—Helical spring type, bolted to car frame.

Prices—Plain, $10; black enamel, $11; brass, $12; nickel or gun metal, $13.

Halladay Bumpers.

L. P. Halladay Co., Streator, Ill.

Models—Made in there models—Imperial and Universal, which are intended to attach

ly all cars; light types are for Ford cars, Hupmobiles and cars of similar weight.

Features—Operate on the cam and flat spring principle; only have a single adjustment; require no attention.

Prices—Standard, $25 a pair; light, $15.

Flentje Recoil Preventers.

Ernest Flentje, Cambridge, Mass.

Models—Made in a single model to fit all cars.

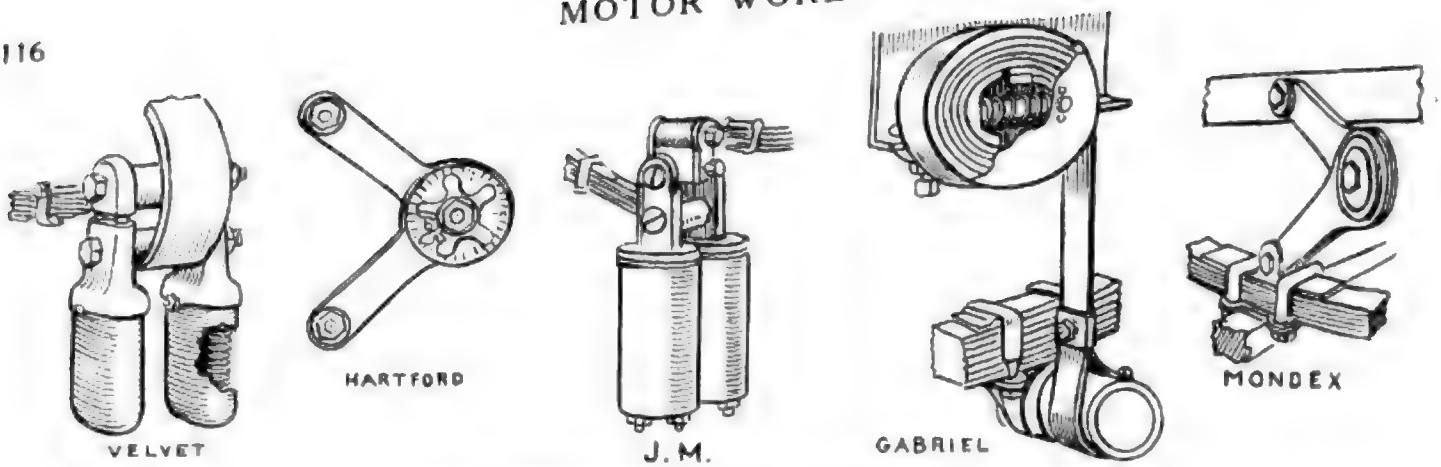
Features—Piston working in a cylinder containing oil and ground mica checks the recoil of the springs; no springs.

J. M. Shock Absorbers.

J. M. Shock Absorber Co., Philadelphia, Pa.

Models—Made in four models for attachment to cars with different spring equipment. Model A is made up of two spring containing members and is attachable to cars with platform suspension or with full or three-quarter elliptic springs; Model B has a single spring containing member and

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VARIED PRINCIPLES REPRESENTED IN SHOCK ABSORBERS

is also attachable to cars with full or three-quarter elliptic springs; Model C is adaptable to cars with single springs attached to rigid spring hangers; Model F is for use with Ford cars only. Models A and C are made in three sizes—for cars up to 2,000 pounds, for cars between 2,000 and 3,000 pounds, and for cars over 3,000 pounds. Model B is made in two sizes—for cars up to 3,000 pounds and for cars over 3,000 pounds.

Features—Helical springs enclosed in metal cylinders; increase the resiliency of car suspension; easily applied in place of the ordinary spring shackle.

Prices—Models F, A, B and C, for light cars, $35 a pair; Models A, B and C, for medium weight cars, $42 a pair; Models A, B and C, for heavy cars, $50 a pair.

Velvet Auxiliary Springs.

John W. Blackledge Mfg. Co., Chicago, Ill.

Models—Made in six models: No. 1, for cars weighing less than 2,200 pounds; No. 2, for cars weighing between 2,200 and 2,800 pounds; No. 3, for cars weighing between 2,800 and 3,600 pounds; No. 4, for cars weighing between 3,600 and 4,400 pounds; No. 5, for cars weighing over 4,400 pounds. The sixth model has enclosed springs.

Features—Attach in place of the spring shackles; comprise four resilient helical springs, which yield as rough spots are encountered; are easily attached.

Prices—No. 1, $18.50; No. 2, $18.50; Nos. 3, 4 and 5, $20; covered, $35.

Gabriel Rebound Snubbers.

Gabriel Horn Mfg. Co., Cleveland, O.

Models—Made in five sizes: Model O, for cars weighing less than 1,400 pounds; Model 1, for cars from 1,400 pounds to 2,200 pounds; Model 2, for cars from 2,200 pounds to 3,500 pounds; Model 3, for cars weighing not over two tons; Model 4, for trucks of from two to five tons.

Features—Do not limit flexibility of the springs; quickly and easily attached without machine work; require no adjustment or attention.

Prices—Model O, $25, set of four; Model 1, $30 set; Model 2, $35 a set; Model 3, $40 a set; Model 4, $50 a set.

Mondex Shock Absorbers.

Aristos Co., New York City.

Models—Made in a single model to fit all makes of cars.

Features—Resistance to change of angularity of the arms is offered by rubber disks which are compressed to a degree that varies with the amount of movement, by the action of two cams positioned face to face. Cam surfaces are made of hardened steel. Adjustment cannot vary with wear. Can be adjusted to suit conditions.

Prices—For a set of four with the attaching brackets, $50.

LAMPS.

Solar Lamps.

Badger Brass Mfg. Co., Kenosha, Wis.

Models—Thirty models, including 3 gas head lamps; 5 electric head lamps; one each gas and electric swiveling searchlight; 6 electric side lamps; 4 electric tail lamps; 5 each oil side and tail lamps; and one generator.

Features—Exclusive black finish with metallic lustre; patented system of double ray projection and eclipsing; special short focus lead glass lens mirror made by Bausch & Lomb; exclusive focusing device; new number lighting tail lamp; column searchlight; dash lamps with inside opening door; new Spherule combination oil and electric side lamps; spring clip fasteners for holding parabolas securely in door, making them easily removable; felt washer between glass and parabola in electric side lamps, making them dirt proof; octagonal doors on several models.

Prices—From $2.40 each to $30 per pair.

E & J Lamps.

Edmunds & Jones Mfg. Co., Detroit, Mich.

Models—Fourteen models, including 2 each electric head and side lamps; 1 electric tail lamp; 3 oil side lamps; 1 oil tail lamp; 3 gas head lamps; 1 combined gas and electric side lamp; 1 commercial vehicle side lamp; 1 reflector; and one generator.

Features—Simplicity; original design; annealed metal parts; three finishes, enamel, brass and nickel; substantial construction; provision for focal adjustment; Ediswan sockets; tungsten bulbs. The generator is of the orthodox type and is fitted with a device styled a "condensation cup" to keep the pipes clear of water.

Prices—Generator, $7; lamps from $2.50 to $12.50 each.

Gray & Davis.

Gray & Davis, Boston, Mass.

Models—Twelve models, including three gas and two electric head lamps; two oil and two electric side lamps; one combination oil and electric side lamp; one oil and one electric tail lamp.

Features—All lamps made from steel dies; conscientious supervision and best materials; weather and dirtproof construction; focusing adjustment; substantial locking device; tail lamp has white window to illuminate license plate; great variety of styles.

Prices—From $3.50 each to $25.00 per pair.

Jaco Lamps.

J. Alexander Mfg. Co., New York City.

Models—Two models for electricity, one a complete lamp and the other a reflector.

Features—Torpedo type lamps fitted complete with bayonet connectors, wire, switch, and 10-candlepower tungsten bulbs; especially adapted for use on Ford cards. Reflectors are true parabolas and are silver-plated on nickel for use in gas lamps; made in eight and nine-inch sizes; easily attached or detached.

Prices—Lamps, per set, $15; reflectors per set, $8.

Ham Lamps.

C. T. Ham Mfg. Co., Rochester, N. Y.

Models—Fourteen models, including eight oil side lamps; one combination oil and

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electric side lamp; four oil tail lamps, and one motorcycle lamp; one electric attachment.

Features—Built on "cold blast" principle; perfect reflection and projection; substantial construction; no smoke or odor; perfect combustion; no soot; no smoky front glasses.

Prices—From $3.50 each to $16.00 per pair.

Mondex Lighting Systems.

Aristos Co., New York City.

Models—Made in a single model for use in connection with any acetylene headlight. Comprises a gas regulator, a controller and switch on the dash and spark gaps on the burners.

Features—The lamps can be lighted and the flame controlled from the dash; no spare coil is needed, the spark being taken from the magneto; readily attachable.

Price—$15.

B & L Lamps.

B & L Auto Lamp Co., New York City.

Models—Twenty-four models, including 4 gas head lamps, 4 electric head lamps, 4 electric side lamps, 4 electric head lamps, 4 each oil side and tail lamps.

Features—All lamps made of heavy gauge brass and are of original designs in which the popular bullet shape is predominant; reflectors are mostly in one piece, with genuine silvered reflectors.

Prices—From $3 to $22 each.

Cowles Lamps.

C Cowles & Co., New Haven, Conn.

Models—Thirty-two models, all electric, including 8 head, 12 side, 8 tail and 11 inspection.

Features—All fitted for electricity only; great variety of designs; waterproof and dust proof construction; choice of various finishes; substantial construction; prices include wiring.

Prices—From $3.25 each to $36.00 a pair.

Old Sol Motorcycle Lamps.

Hawthorne Mfg. Co., Bridgeport, Conn.

Models—Thirteen models, including five combination lamps; four generator lamps; four detachable generator gas head and electric tail lamps.

Prices—Lamps from $2.50 to $6.50; generators from $2.50 to $3.75.

Neverout Lamps.

Rose Mfg. Co., Philadelphia, Pa.

Models—Made in all shapes and sizes for use with both oil and with electric lights.

Prices—From $2.50 to $50.

Rushmore.

Rushmore Dynamo Works, Plainfield, N. J.

Models—Three models of electric lamps, including one each head, side and tail, and a number of models of gas lamps.

Features—Substantial construction; elegant finish; dirt- and waterproof; Rushmore lens mirror.

LUBRICANTS.

Wolverine Lubricants.

Wolverine Lubricants Co., New York.

Recommended by makers of 28 cars and motors; has burning point of 450 to 470 degrees, has low gravity and light color; no free carbon and small quantity of fixed carbon; will retain consistency at high temperature; burns cleanly. Wolf's Head Cylinder Oil, light, medium and heavy; 50-gallon barrel, 50 cents a gallon; half barrel, 54 cents a gallon; 10-gallon can, $5.75 each; 5-gallon can, $3.25 each; 1-gallon can, 75 cents. Wolf's Head Crystal Oil, extra filtered, light, medium and heavy, ranges from 75 cents to $1.60 a gallon, according to quantity and kind. Greases—Motor Grease, Non-Flowing Oil, Graphite Grease, Light and Dark Gear Compound, 25 cents a single pound to $5 for 50 pounds. Packard cylinder oil, bearing trademark of Packard Motor Car Co., 50 cents a gallon in 50-gallon quantities, to 75 cents for single gallon. Packard cup and graphite greases, 25 cents a single pound to $5 for 50 pounds.

Monogram Lubricants.

New York Lubricating Oil Co., New York.

Refined from pure, high-grade Pennsylvania crude oil, manufactured solely for lubrication of gas engine cylinders; economy, efficiency and uniformity are claimed. Company features co-operation with dealers in selling. Oils—"V" Gas Engine, Light Gas Engine, Medium Gas Engine, Heavy Gas Engine, Extra Heavy Gas Engine, Timing Gear, Gear Case and Special Steamer; in barrels, half barrels and five-, ten- and one-gallon cans. Greases—Yellow Motor Grease, Yellow Gear Grease, Graphite Motor Grease, Graphite Gear Grease, Non-liquid Oil and Gear Case Compound; in barrels, kegs and two-, five-, ten- and twenty-five-pound cans.

Albany Lubricants.

Albany Lubricating Co., New York.

Albany grease, for axle cups, compression caps and bearings. Cook's lubricant, a new product, for transmissions, differentials, and equalizing, timing and steering gears; will not run out of gear case; adheres to gears and always maintains a film between surfaces in contact. Albany auto oils, full line for various needs of a car.

McCord Lubricators.

McCord Mfg. Co., Detroit, Mich.

Models—Made in 11 models: No. 1, capacity one quart, one feed; No. 2, capacity one quart, double feed; No. 3, capacity two quarts, single feed; No. 4, capacity two quarts, double feed; No. 5, capacity two quarts, three feeds; Nos. 6 to 11, capacity one gallon, one to six feeds, respectively.

Features—All working parts of forged steel, case hardened, and are immersed in oil; delivery can be quickly regulated to meet conditions; double pump eliminates pressure in the sight-feed glasses.

Prices—No. 1, $25; No. 2, $30; No. 3, $28; No. 4, $35; No. 5, $42; No. 6, $33; No. 7, $39; No. 8, $45; No. 9, $51; No. 10, $57; No. 11, $63.

Acheson Graphites.

International Acheson Graphite Co., Niagara Falls, N. Y.

Graphicoat, a new product, applied with a brush to rims; prevents sticking of rims or tires after being in position for a considerable length of time; requires no painted surface as a ground work; will not cake, gum, attract or hold dirt, and is not influenced by extremes of temperature. Also is designed for use in spring leaves and as a lubricant for bolt threads, pipe joints and gaskets. Other graphite products.

Harris Oils and Greases.

A. W. Harris Oil Co., Providence, R. I.

Made in a variety of different grades to suit motor conditions. Harris Transmission Compound is a grease especially made for the lubrication of gearsets.

Havoline Oils.

Havoline Oil Co., New York City.

Made in several different grades, to suit all motor conditions.

Features—Will not gum or congeal; non-carbonizing.

Gargoyle Mobiloils.

Vacuum Oil Co., New York City.

Made in several different grades especially to suit varying conditions.

Features—Non-carbonizing and non-congealing.

Panhard Oils and Greases.

George A. Haws, New York City.

Made in several grades to suit all motor conditions.

Features—Will not carbonize or congeal.

Detroit Lubricators.

Detroit Lubricator Co., Detroit, Mich.

All sizes and all types of lubricators and oil and grease cups are stocked.

Texaco Motor Oil.

The Texas Co., New York.

Will not form hard carbon deposit, has proper body for sealing space between piston rings and cylinder walls, will not con-

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geal in cold, is put up in sealed can under maker's guarantee, can may be conveniently carried under seat; company features its co-operation with dealers by means of various forms of advertising.

Oilzum Lubricants.
White & Bagley Co., Worcester, Mass.

SOAPS AND POLISHES.

Rex Polishes.

Armiger Chemical Co., Chicago, Ill.

Rex cream polish for brass, copper and steel, nickel plating polish, wood oil for varnished work and leather dressing for tops and upholstering material.

Features—Ease of application; will not damage the articles applied to.

Baum's Automobile Body Soap.

Baum's Castorine Co., Rome, N. Y.

A soap for washing motor car bodies which is absolutely neutral and which therefore will not injure the paint or varnish work. The soap produces a fine lather and cleans with ease.

Slikup Specialties.

N. B. Arnold, Brooklyn, N. Y.

Materials for cleaning tires, tops, upholstery, bodies, motors and all other parts of the car.

Soaps and Polishes.

J. Eavenson Sons, Inc., Camden, N. J.

Blue Ribbon Metal Polishes.

Int'l Metal Polish Co., New York City.

Soaps and Polishes.

J. T. Stanley, New York City.

Metal Polishes.

Geo. W. Hoffman, New York City.

FUEL PUMPS.

Bowser Pumps and Storage Systems.

S. F. Bowser & Co., Ft. Wayne, Ind.

Models—Pumps, tanks and storage systems are made in various sizes and styles, both portable and stationary, for handling either gasolene or kerosene; lubricating oil storage tanks and outfits also are manufactured.

Features—Pump barrels made of seamless brass tubing; valves of selected brass; pumps measure accurately and are readily adjusted to measure even fractions of gallons; gallon meter attached to the long distance systems registers to 10,000 gallons and repeat.

American Fuel Pumps and Storage Tanks.

American Pump & Tank Co., New York.

Made in a number of different sizes and forms, both stationary and portable.

Features—Pumps all are of the continuous flow type.

Fuel Handling Apparatus.
Wayne Oil Tank & Pump Co., Ft. Wayne, Ind.

SPECIALTIES IN GENERAL.

Oliver Jacks.

Oliver Mfg. Co., Chicago, Ill.

Models—Three models, Peerless in eight sizes, Oliver Tire Saver in one size and a new model, Oliver Sampson, in three sizes. All three models are of the dog-and-rack type. The Peerless model is provided with a lever which can be used as a tire tool, and when so ordered, a tire removing attachment is furnished so that the jack can be used to facilitate the removal of tires. The action of the jack is reversed by turning the handle upside down. The Tire Saver is made for cars weighing up to 3 tons and is provided with an adjustable bracket to engage with the wheel hub; the face of the bracket is leather covered to prevent marring. The new Oliver Sampson is made for road use for cars of up to 3 tons, and for garage use, with a wooden base, attached handles and double brackets, one size for cars up to 3 tons and the other for cars of 3 to 6 tons in weight.

Features—Unbreakable malleable iron frames, positive action, arched base to prevent tipping.

Prices—Peerless, for cars of 1 ton, 8½-inch, 10-inch, 12-inch, $2.50; with tire removing attachment, $3.25. For cars of 2 tons, 9¾-inch, 11¼-inch, 11-inch (low bracket), $3; with tire removing attachment, $3.75. For trucks of 5 tons, 11-inch, $6; 14-inch, $7. Tire Saver, $1.50. Oliver Sampson, for cars of 3 tons, 11½-inch, $3; 15-inch, $5; for cars of 6 tons, 17½-inch, $8.

Vanguard Windshields.

Vanguard Mfg. Co., Joliet, Ill.

Models—Made in four models; Nos. 74 and 75 are straight and are 25½ x 38 inches and 27½ x 42 inches in height and width, respectively. Nos. 77 and 78 are of the zig-zag type and measure, respectively, 25½ x 38 inches and 29½ x 42 inches in height and width.

Features—Ball-bearing type joints, steel frames. Piano hinge along bars of the zig-zag types prevents rattle; strap loops for the attachment of top straps provided on all models.

Prices—Models 74 and 75, coach glass, $12.50; plate glass, $17.50. Models 77 and 78, coach glass, $12.50; plate glass, $17.50. All finished in black enamel.

Star Tire Trunks.

Merchant & Evans Co., Philadelphia, Pa.

Models—Combined tire and tool case made to take either 34-inch or 36-inch tires, and either 6, 8 or 10 inches deep.

Features—Made of pressed steel; light, durable, moisture and dust proof, easily opened and closed; fastened with Yale lock.

Prices—Either 34- or 36-inch diameter, depth 6 inches, $21; 8-inch, $23; 10-inch, $25.

Ajax Trunk and Tire Cases.

Ajax Trunk & Sample Case Co., New York City.

Models—Trunks in four models: Nos. 30 and 32, opening at the top in the orthodox manner; Model No. 250, a combination of a suitcase carrier and luggage trunk; the fourth model is a footrest trunk designed to take the place of the usual footrest in the tonneau of the car. Models 30, 32 and 250 are made in 28-, 30- and 32-inch sizes. Ajax Refrigerette for carrying luncheons, etc., is made in a single model. Ajax double tire trunks are made in sizes suitable for all tires.

Features—Best quality trunk board supported in steel frames used in the construction, black soleleather hand stitched at the corners. The combination model is notched at the back to accommodate the overhang of the car body. The foot rest trunk is covered with an aluminum sheet, embossed. Double door on the tire trunks prevents the entrance of moisture or dirt.

Prices—Trunks: No. 30, 28-inch, $22.50; 30-inch, $24; 32-inch, $25; No. 32, 28-inch, $30; 30-inch, $32; 32-inch, $34; No. 250, 28-inch, $30; 30-inch, $33; 32-inch, $36. Foot rest trunk, $18; Refrigerette, $18; tire trunks, 26-inch, $22.50. Other diameters, $1 an inch extra.

Q. D. Rim Removers.
Tobey Glare Removers.

William L. Tobey, East Boston, Mass.

Models—Q. D. Rim Remover made in a single model for removing the locking ring from any size quick-detachable rim. The Glare Remover, which is made for attachment to the windshield rod, also is made in a single model.

Features—The Q. D. rim remover is so small that it can be carried in the pocket; its operation requires nothing more than the insertion of the hook between the retaining ring and the rim flange and screwing up the screw with a screwdriver until the locking device is uncovered; the lock ring then can be removed. The Glare Remover is a piece of amber colored glass carried in a circular frame which attaches to the windshield frame.

Prices—Q. D. Remover, 75 cents. Glare Remover, $2.50.

B'Line and Copley Grease Guns.

Randall-Faichney Co., Boston, Mass.

Grease guns in various sizes and types with different styles of handles; for handling anything from gasolene to heavy grease. Made to push in, to screw in, or both.

Features—Plungers and barrels ground to an exact fit, so that there is no leakage; no packing used; can be used to carry oil, as

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oil will not leak past plungers; special guns for priming; Copley guns have leather-packed plungers and are for handling oils only.

Prices—B'Line guns, from $1.50 to $5, according to size; Copley guns from $1 to $4.

G-P Muffler Cutouts.

G. Piel Co., Long Island City, N. Y.

Models—Made in nine sizes to take 1¼-, 1½-, 1¾-, 2-, 2¼-, 2½-, 2¾-, 3- and 3¼-inch pipe.

Features—When open, the valve tongue closes the path to the muffler; when closed, pressure of gases tends to seat tongue on its seat. Easily attached, simply by slipping over the ends of the pipes and clamping with set screws.

Prices—For 1¼- to 1¾-inch pipes, $4.50; for 2- to 2½-inch pipes, $5; for 2¾- to 3-inch pipes, $5.50.

Gilmer Tire Repair Pliers.

G. Walker Gilmer, Jr., Philadelphia, Pa.

These are spreading pliers with which to widen a cut in a tire while repairing material is being introduced into the wound; jaws of the pliers are at right angles to the levers so that tire is not torn when they are inserted, slight pressure only necessary to open cut; ratchet in handles of pliers leaves operator with both hands free to work; can be removed without disturbing repair gum; equipment includes combination cotter pin hook and cleaner; price $1.

Perfect Gasolene Filters.

Gasolene Filter Co., New York City.

Models—Single model made for attachment to the fuel line.

Features—Chamois made in the form of a collapsible bellows forms the filtering medium, the area of the chamois being sufficient not to impare the flow of the fuel. By collapsing the bellows, which is accomplished by movement of a rod provided for the purpose, the collection of sediment can be removed from the chamois and drained through the pet cock.

Price—$5.

Hartford Jacks.

Hartford Suspension Co., Jersey City, N. J.

Models—Made in a single model, 10½ inches high, with a lift of 7 inches.

Features—Gearset operating in conjunction with a long lever, which, however, requires but a short stroke, facilitates the lifting operation. Case of malleable iron, rack cut from steel, gears machine cut and hardened. Actuating mechanism of heat-treated chrome nickel steel.

Price—$5.

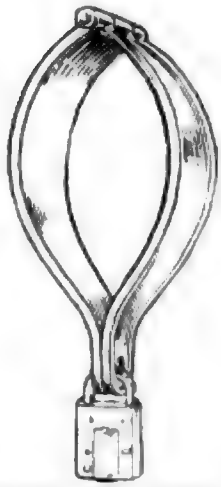
Townsend Grease Guns.

S. P. Townsend & Co., Orange, N. J.

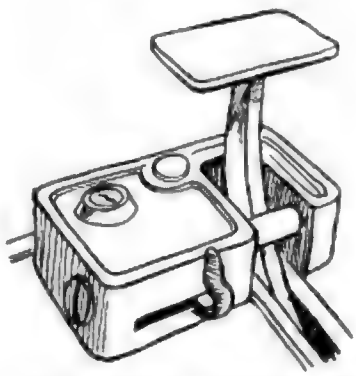
Models—Made in four different sizes to hold 6, 8, 12 or 16 ounces; all sizes are similar in construction.

Features — Inner removable cylinder which permits of quick and cleanly loading; piston, operated by a worm and handle, makes operation easy and rapid.

Prices—Six-ounce, $3; 8-ounce, $3.50; 12-ounce, $4; 16-ounce, $5.



WATCH DOG AUTO LOCK



AUTO THIEF PROOF LOCK



DOVER SAVAL



COWLES FOOT WARMER

FOUR INTERESTING SUNDRIES

Warmed Driving Gloves.

Carron & Co., Inc., New York.

Gloves are leather gauntlets with an electrical heating element in the wool lining; in thumb and forefinger of each is a thin disk connected to wires which give contact with metal plates on the steering wheel; six-volt ignition or storage battery may be used; current flows only when gloves are in contact with the plates; warmth may be regulated by wearer.

Cowles Foot Rest and Heater.

Charles Cowles & Co., New Haven, Conn.

Models—Made in a single model, 33 inches long, embracing the use of four tubes.

Features—Ingenious combination of two articles; is not in the way in the summer, for it serves as a foot rest; easily attached to exhaust pipe by means of flexible metallic tubing.

Prices—Finished in brass, $24; in nickel, $30.

Jaco Specialties.

The J. Alexander Mfg. Co., New York.

Double vibrator horn, claimed to produce twice as many vibrations as the ordinary horn. Mirrorscopes, dome lamps, dashboard lamps, wind brake, individual windshield, adjustable bumper, cut glass flower vases, brass tire holders, malleable iron tire holders, license pad holders and radiator ornaments.

Neverout Radiator Heater.

Rose Mfg. Co., Philadelphia, Pa.

Consists of heater, utilizing illuminating gas, tube which connects with top of radiator through filler cap and with bottom through petcock; designed to keep water warm while car is standing in cold garage and also is claimed to be capable of warming a garage considerably.

E-C Tire Carriers.

E-C Sales Co., Chicago, Ill.

Types—For attachment to the running board, and for attachment to the rear.

Features—Adjustable to fit different sized tires; strength and rigidity; easily attached.

Allen Friction Wrenches.

Allen Wrench & Tool Co., Providence, R. I.

Models—Friction socket wrenches made in four styles; friction drills and spark plug wrench sets.

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Features—Embodies all of the features of the ratchet wrench with the elimination of teeth, springs and pawls; grips instantly without loss of motion.

Keystone and Presto Tire Covers.

Nathan Novelty Mfg. Co., New York.

Keystone tire cover; water-shedding, adjustable on new or old casings, fastens with snap buttons, perfect fit insured by highly tempered flat spring inserted in edge of flap. Packed in individual boxes. Presto cover; made of enameled goods, otherwise similar to the Keystone.

Burbank Top and Cover Cloths.

Wm. R. Laidlaw, Jr., New York City.

English Burbank cloths are made in a variety of weights and colors; Bedford Waterproof cords for replacing leather on the upholstering also are shown.

Features—Burbank cloth, although it has no rubber or other similar substance in its makeup, is waterproof.

Dover Specialties.

Dover Stamping & Mfg. Co., Cambridge, Mass.

Funnels, combined measures and funnels, measures, gasolene cans, radiator fillers, drip pans, soap economizers, tire testing tanks, oil cans, electric bulb cases, waste cans, garage pails, and various and sundry sheet metal articles.

Turner Motor Washer.

Turner Brass Works, Sycamore, Ill.

Models—Made in a single model; tank holds a quart of gasolene.

Features—Tank is drawn from a piece of brass, bottom being brazed in place; adjustable nozzle will produce either a very fine spray or a solid stream for cleansing in corners.

Watch Dog Lever Locks.

S. Breakstone, Chicago, Ill.

Made in a single size for locking the spark and throttle levers to a spoke of the steering wheel web when the car is not in use.

Features—Simple, quickly and easily applied, durable, effective.

Price—$2.

Berg Motor Car Trunks.

Berg Auto Trunk & Specialty Co., New York City.

Made in various sizes and shapes and for all purposes.

Pyrene Fire Extinguishers.

Pyrene Mfg. Co., New York City.

Models—Made in a single model, 14 inches long and 3 inches in diameter.

Features—Smothers a gasolene or oil fire without spreading it; easily handled; will not injure metal or woodwork or fabrics.

Prices—Brass, $7; nickel plate, $8.

Simplex Fire Extinguishers.

David Kahnweiler's Sons, New York City.

Models—Made in a single model, 14 inches long and 3 inches in diameter.

Features—No pump used, liquified gases are forced out by carbon dioxide under pressure; will not injure property; easily handled.

Turner Torches and Brazing Outfits.

Turner Brass Works, Sycamore, Ill.

Models—A variety of models of different sizes for burning gasolene, kerosene and alcohol.

Features—Tanks drawn from sheet brass with the bottom brazed in place. Holders for soldering bits are included.

Benford Mfg. Co., Mt. Vernon, N. Y.

Benford gas-lamp lighters, and Monarch spark plugs.

Features—Lamps can be lighted while the car is in motion with but a single motion.

Prices—Lighters, $5; plugs, $1.

Sundries.

Donnelly Motor Equipment Co., New York.

National tire pumps, National vulcanizers, Gladrag polishers, body soaps, Little Steersman steering gear attachment.

J. H. Faw, New York City.

Gaskets, both round and manifold; blowout patches, reliners, Mazda lamps, Redfield plugs, Eureka valve grinders, Ford lighting sets, etc.

Portable Garages.

James Ashley, New York City.

Light garages made of sheet metal and designed to be easily erected and taken down.

Coes Wrenches.

Coes Wrench Co., Worcester, Mass.

Drop forged, socket, end and adjustable wrenches in all sizes and styles.

Polson Windshields.

Polson Mfg. Co., Buffalo, N. Y.

Windshields in various sizes and in both the straight and zig-zag types.

Clear Vision Windshields.

Cox Brass Mfg. Co., Albany, N. Y.

Made in all sizes in both straight and in zig-zag form.

Ten Eyck Air Pumps.

Auburn Auto Pump Co., Boston, Mass.

Air pumps and pneumatic jacks.

Giant Jacks.

S. B. R. Specialty Co., East Orange, N. J.

Giant and Little Giant jacks and muffler cut-outs.

Gray Specialty Co., Newark, N. J.

Blow-out patches, tire boots, etc.

Perfecto Wind Deflectors.

Perfecto Wind Deflector Co., Boston, Mass.

Grinnell Gloves.

Morrison Ricker Mfg. Co., Grinnell, Ill.

Driving gauntlets in a variety of styles.

Tools.

Rich Tool Co., Chicago, Ill.

GENERAL SUPPLIES.

Smalley Daniels, Detroit, Mich.

New Era Replacement springs, Sly tire holders, Auto Thiefproof locks, and Mitchell steel boxes.

Features—New Era Springs are made for replacing broken springs on a number of the most popular cars; primarily they are intended to be carried in stock by the jobber; Sly tire holders are made for running board attachment for either single or for two tires; they carry tires mounted on demountable rims; Auto Thiefproof locks are made to attach to the footboard and lock the clutch pedal down so that the clutch cannot be engaged.

Prices—New Era Springs from $3.90 to $13; sly tire holders from $5 to $8.50; Auto Thiefproof locks, $5.

Charles O. Tingley & Co., Rahway, N. J.

Blowout patches, 50 cents to $1; vulcanizing fluid, and solution, sets of ¼ pint, 75 cents; ½ pint, $1; pint, $1.25; quart, $2.25; tire patches, 2½ cents to 35 cents; Gum Gum, 50 cents per tube; valve bases, 20 cents to 30 cents; Gum Gum and vulcanizing fluid sets, $1; tire solder sets, $1.50; concentrated cement, 20 cents to 60 cents; red rubber gas tubing, 10 cents per foot; lamp connectors, 15 cents each; soapstone, 15 cents per can; ironwork varnish, 25 cents per pint; rubber rougheners, 20 cents; top dressing, 50 cents per can; waste, 10 cents and 20 cents per package; tire tape, 5, 10 and 25 cents per roll; rim shellac, rim cement, tire plugs; Diamond aluminum; Special rubber cement.

General Supplies.

Charles E. Miller, New York City.

Brampton chains, United States tires, Pan-American oils and greases, El Arco radiators, Victor pumps, Wright wrenches, Wizard magnetos, Blair tops, Coe's wrenches, Clear Vision windshields, J-M

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... Sharp spark plugs, and a variety of specialties.

Stevens & Co., New York.

... ark plugs, horns and reeds, pumps, com... and and single cylinder, hand operated; ... air pumps, pump connections, tire ... gauges, burners, tubing, nipples and cocks, ... grease guns, gaskets, switches, tools.

L. P. Halladay Co., Streator, Ill.

Side and rear tire holders, package carriers, Reliable oil can holders, license brackets, gasolene strainers, hood latches and handles, gear-shift levers, control pedals, lamp brackets, rods, etc.

Emil Grossman Co., New York City.

Red Head spark plug wrenches, ignition cable and terminals, Mirrorscopes, side and rear tire holders, license brackets, control pedals, Security windshield cleaners, etc.

Garage Equipment Co., Milwaukee, Wis.

Universal bumpers, torpedo tire holders, windshields, vulcanizers, jacks and lamps.

Motor Car Equipment Co., Akron, O.

Parts, Fittings and Materials for Factory Use

AXLES, SPRINGS, ETC.

Weston-Mott Axles, Hubs and Rims.

Weston-Mott Co., Flint, Mich.

Model 900-L is a new pleasure car rear axle, of which the housing, hub bodies, oil shedders and brake drums are of pressed steel; shafts and gears are of high quality steel and ball bearings are fitted. Another new product is a line of double-reduction rear axles for commercial cars; these are designed to take the place of chain drive constructions and are for use in light commercial vehicles; features are, elimination of chain drive construction, fewness of parts and gear ratios of from 5 to 1 to 9 to 1 are full-floating type; liberal braking surface is provided. Line also includes fixed-spindle-floating, single-bearing-full-floating and double-bearing-full-floating types of rear axles; tubular, square-front and I-beam front axles.

Hele-Shaw Clutches and Evans Axles.

Merchant & Evans Co., Philadelphia, Pa.

Models—Clutches made in ten sizes for transmitting power from 10 to 100 horsepower. Evans rear axles are of the full-floating type and have the gearset incorporated in the differential housing; they are made for both pleasure cars and commercial vehicles.

Features—Clutches are of the multiple disk type with the plates running in oil; plates are provided with "V" grooves which fit into one another and render the clutch action "sweet." Evans axles are well designed; the gearset provides three speeds forward and reverse; on both second and third speeds the drive is direct.

Prices—Clutches, $70, $80, $90, $100, $110 $130, $150, $170, $210, $250. Axle price on application.

Timken Axles.

Timken-Detroit Axle Co., Detroit, Mich.

Front and rear axles for both pleasure cars and trucks, complete with steering knuckles for front axles; rear axles of both live and dead types; live axles complete with differential, brakes, housing, etc. Also jackshafts complete, radius rods, etc. All bearings Timken roller.

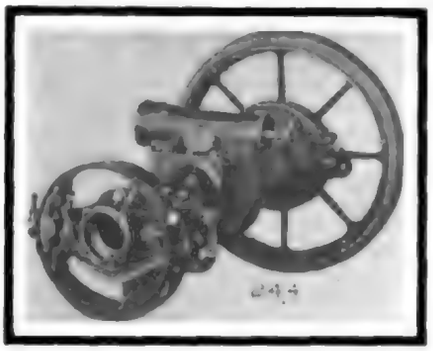
Features—High-grade material and workmanship throughout; extreme accuracy of construction; all moving parts enclosed and dustproof; special attention given to lubrication problems; large variety of equipment, so that practically any requirements can be met.

Sheldon Axles and Steel Wheels.

Sheldon Axle Co., Wilkesbarre, Pa.

Both front and rear axles are made in a variety of different weights and designs. The newest productions are the Type W-I rear axle, fitted with worm drive, and Sheldon cast steel wheels.

Features—Front axles are one-piece drop forgings, I-beam in cross-section; thrust bearings between steering knuckles and the yokes make for easy steering; Tobin bronze pivot bolt bearings fitted with rachet grease cups. Type W-I rear axle equipped with David Brown & Son worm mounted on Rhineland bearings; differential gears mounted on New Departure bearings. In the standard rear axles made, Standard and Bower roller bearings and New Departure, Rhineland, F & S, Hess-Bright, Radax and Norma ball bearings are fitted at the option of the user, and all are interchangeable. Steel wheels also optional. Steel wheels are durable and resilient; light.



SHELDON WORM DRIVE AND STEEL WHEEL.

Tuthill Springs.

Tuthill Spring Co., Chicago, Ill.

Types—Semi-elliptic or half springs and three-quarter scroll springs, made in nine standard sizes from 35 to 48 inches; full elliptic and scroll elliptic springs made in six standard sizes from 36 to 40 inches. Odd sizes and shapes made to specification.

Features—Alloy steels used in the manufacture; rebound clips are provided.

Prices—Half elliptics from $5 to $18.50 a pair; three-quarter elliptics from $7.50 to $27.75 a pair; full elliptics from $7 to $19 a pair.

E-C Axles.

E-C Sales Co., Chicago, Ill.

Made in a variety of models and sizes, both front and rear.

Features—Accessibility of the gear units on the rear axles; one-piece cast steel housing, no truss rods, tubular drive shafts, liberal brake dimensions, one-piece casting around differential bearings, pinion adjustment independent of pinion bearing adjustment.

American Axles.

American Ball-Bearing Co., Cleveland, O.

I-beam front axles and full-floating rear axles, bevel gear driven, both adjustable and non-adjustable, and worm driven axles are made in various sizes.

Features—Shafts of chrome-vanadium steel heat treated; tubing of nickel steel heat treated, choice of bearings.

Perfection Springs.

Perfection Spring Co., Cleveland, O.

Thin-leaf springs for touring cars; springs for 1-, 2-, 3-, 5- and 7-ton trucks. Oil-tempered, heat treated and of American or imported Krupp silico-manganese steel.

Harrow Springs.

Harrow Spring Co., Milwaukee, Wis.

Made to specification from either carbon or alloy steels.

Marburg-Hagen Springs.

Marburg Bros., Inc., New York City.

Made to specification from pure carbon steel.

Huston Springs.

Huston Multiple Car Spring Co., Philadelphia, Pa.

Hess Springs and Axles.

Hess Spring & Axle Co., Carthage, Ohio.

Torbenson Axles.

Torbenson Gear & Axle Co., Newark, N. J.

Three sizes, for ¼, 1 and 2 tons capacity.

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Features—Live axles are separate from the load bearing axle, which is a drop forging, and drive the wheels through the internal gears on the wheels and spurs on the ends of the drive shafts.

Smith Axles.

A. O. Smith Co., Milwaukee, Wis.

Both front and rear axles in various sizes.

Features—Front axles are made with an extra low drop from the spindle to the spring pad. Rear axles are made with internally trussed pressed steel housings. Ends reinforced with long swedged tubes, the outer ends of which form the bearing sleeves; driving mechanism built on the unit principle and is easy of adjustment.

STEERING GEARS.

Lavigne Steering Gears.

Lavigne Gear Co., Racine, Wis.

Models—Made for both pleasure cars and commercial vehicles. Three models, known as A, B and C, are made for pleasure car use. A is for cars weighing up to 2,000 pounds; B is for cars weighing between 2,000 pounds and 3,000 pounds; C is for cars weighing over 3,000 pounds. For commercial cars five models are made: A for trucks of less than a ton, B for 1-ton trucks, C for 2-ton trucks, D for 3-ton trucks, and E for 5-ton trucks.

Features—Irreversible; no end thrust, no loose parts, automatically take up wear, compact, dustproof.

Gemmer Steering Gears.

Gemmer Mfg. Co., Detroit, Mich.

Models—Made in eight models, four for pleasure cars and four for commercial vehicles. Models C, K, O and S are for pleasure cars; Model C has a single worm; K, O and S have double worms. The commercial steering gears are R-2, K-2 and O-2; R-2 has a single worm; K-2 and O-2 have double worms.

Features—Worm and sector type; full worm wheels with squared or tapered shafts; F & S ball bearings; spring lever, ratchet or frictional controls.

GEARS, CHAINS, ETC.

Magic Gearsets.

Aristos Co., New York City.

Made in a single model providing three speeds forward and reverse.

Features—The design of the gearset is entirely new and embraces the use of an internal gear of the step-up cone type, which provides three gears of different diameters; the gear is housed at one end of the transmission casing and is attached to the propeller shaft. A spur gear is arranged to slide on the splined end of shaft which enters the other end of the housing and which attaches to the clutch of the car; a universal joint is fitted to this shaft so that the spur can be made to mesh with either of the there internal gears and provide three gear ratios. The spur gear is shifted by means of a yoke which is operated through the intermediary of the gear shift lever. Reverse is obtained by the use of an idle pinion.

Cotta Transmissions.

Cotta Transmission Co., Rockford, Ill.

Gearsets for either shaft or chain drive; three forward speeds. Gears always in mesh and changes made by shifting dog clutches. Made in various sizes to transmit from 15 to 130 horsepower.

Features—Dog clutches for engaging different speeds, relieving the gear teeth of shocks; selective control; adaptability to right, left or center control; substantial construction of the best materials.

Prices—From $100 to $250, according to size, for shaft drive, and from $180 to $625 for chain drive, which includes differential and extension housing for differential.

Link-Belt Silent Chains.

Link-Belt Co., Philadelphia, Pa.

Made in pitch sizes from ⅜ of an inch to 2½ inches, and in widths which are ample for the power to be transmitted.

Features—Links are provided with steel bushes which are removable; washers between the links provide unbroken pin bearing the full width of the chain.

Brown-Lipe Gears.

Brown-Lipe Gear Co., Syracuse, N. Y.

Transmission and differential gears; unit power plant and rear axle gearsets, control sets, multiple disk clutches, etc

Features—New models of four-speed gearsets; special differentials for commercial vehicles; modern methods of gear-cutting; quiet-running gears.

Motometer Indicator.

Motometer Co, New York City.

Models—Made in a single type for attachment to the radiator filler cap of any car.

Features—The device comprises a thermometer which is visible from the driver's seat and serves to warn when the motor is running hot.

Price—$10.

Coventry Chains and Gearsets.

Sarco Engineering Co., New York City.

Coventry silent chains in all pitches and widths, as well as applications of the chain drive to the camshaft, magneto and fan drive and in the gearset.

Ross Gears and Differentials.

Ross Gear & Tool Co., Lafayette, Ind.

Models—Steering gears are made in five models, all for commercial car use; B.F. is the heaviest, and B.C. the smallest; the intermediate gears are B.A., B.H., and B.B. Differentials are built in three sizes—A.F. for 5-ton trucks, A.H. for 2- and 3-ton trucks, and A.B. for 1-ton trucks. All are of similar design.

Features—Length of the bearings in the steering gears. Web-shaped housing in the differentials.

Worm Gears and Worm Drives.

Wm. Cramp & Sons Shipbuilding Co., Philadelphia, Pa.

Rough and machined castings and blanks for worm drive construction; finished worm drives of approved design.

Munice Gearsets.

Munice Gear Works, Munice, Ind.

Sliding and planetary gearsets and jackshaft assemblies in several different weights.

Lefevre Gearsets.

Lefevre Arms Co., Syracuse.

Both sliding and planetary gearsets are made in several sizes, as well as complete jackshaft assemblies and differentials and gears.

BEARINGS.

Hess-Bright Ball Bearings.

Hess-Bright Mfg. Co., Philadelphia, Pa.

Types—Radial bearings with wide races, light type made in 23 sizes from 30 mm. in diameter to 200 mm.; medium type from 35 mm. to 240 mm., and of the heavy type from 62 mm. to 265 mm. With narrow races, light type in 21 sizes from 32 mm. to 185 mm.; medium type, 15 sizes from 37 mm. to 168 mm.; heavy type, six sizes from 65 mm. to 103 mm. Six sizes of special small bearings from 16 mm. to 26 mm. are made; magneto bearings, which differ somewhat from the others in mode of assembly, are made in four sizes from 28 mm. to 44 mm. in diameter. Thrust bearings are made in a variety of sizes.

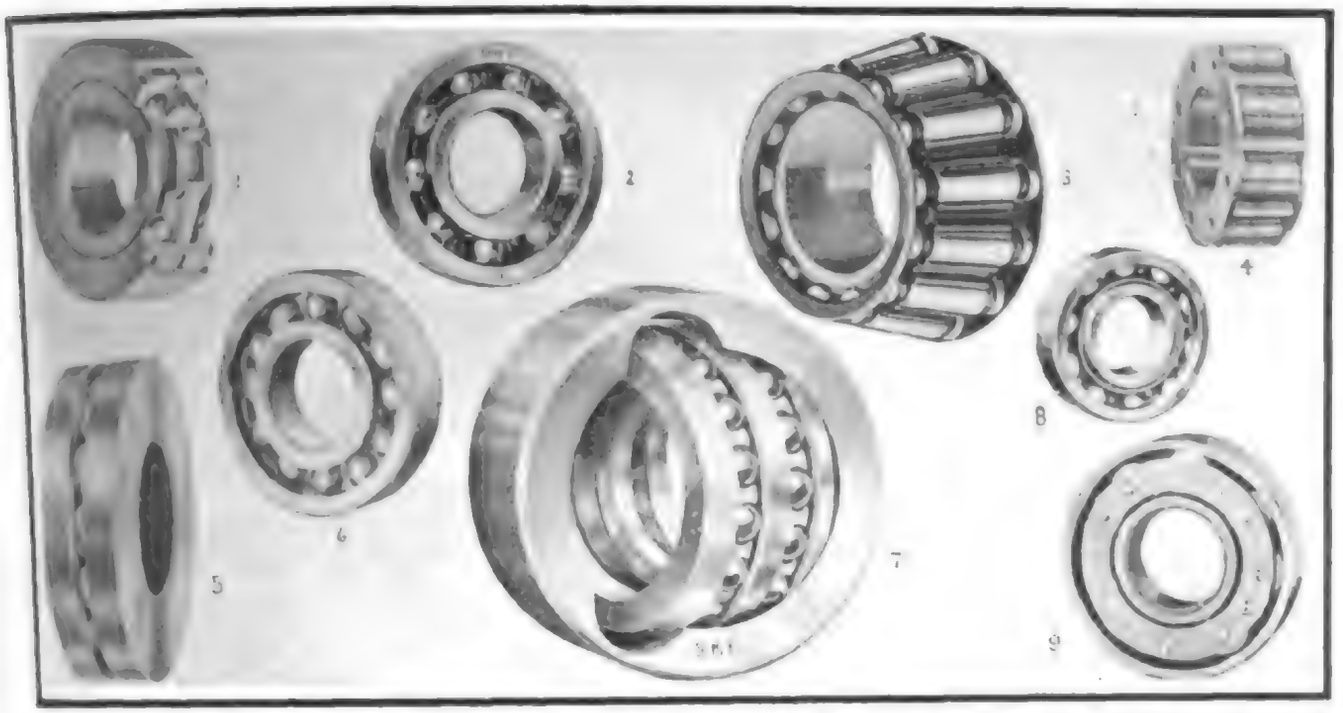
Features—Radial bearings, save the magneto types, are assembled without notching the races or risking distortion by pressing the bearings into the races. Retainers are made of pressed steel. Magneto bearings are assembled by slipping the inner raceway with the balls into place in the retainers into the outer raceway, one side of the outer raceway being tapered. The thrust bearings are provided with a rounded bottom raceway which tends to shift until the load is equally distributed on all of the balls.

Bower Roller Bearings.

Bower Roller Bearing Co., Detroit, Mich.

Made in three series known as N, Annular and T. Series N is made in diameters increasing from 52 to 240 mms.; Annular bearings are made in diameters from 52 mms. to 265 mms.; series T is made in diameters from 2.24 inches to 4.33 inches.

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ANTICOUS TYPES OF BALL AND ROLLER BEARINGS; 1—NEW DEPARTURE; 2—HESS-BRIGHT; 3—TIMKEN (Roller); 4—HYATT (Roller); 5—BOYER, 6—R. I. V.; 7—S. K. F.; 8—S. R. O.; 9—BOWER (Roller)

Features—Combined radial and thrust ...—body of roll carries **radial load,** ...e carries thrust; increase of radial load ... and increase thrust and vice versa; ...adjustable.

Prices—Series N, from $3.25 to $85; An... from $5.25 to $110; Series T, from $... to $12.50.

R. I. V. Ball Bearings.

R. I. V. Co., New York City.

...bearings made in three types—light, ... and heavy. Light bearings are ... in 23 sizes from 30 mms. in diameter ... mms. in diameter; medium weight ...ings are made in 23 sizes from 35 mms. ... to 240 mms in diameter; heavy ...ings in 16 sizes from 62 mms. in diam... 365 mms. in diameter. Type F thrust ...ings with self-aligning lower raceways ... in 12 sizes from 53 mms. to 140 mms.; Type G, washer bearing, in 18 sizes from ... mms. to 150 mms.

Features—Uniformity of materials; accu... of workmanship; design.

Prices—Radial, light, from $3 to $48; ...ium, from $3.75 to $90; heavy, from $... to $135. Type F, from $6.40 to $33.15; ...

Hyatt Roller Bearings.

Hyatt Roller Bearing Co., Detroit, Mich.

...r bearings in all sizes and for all ... of automobile service, either pleasure ... commercial vehicles.

Features—Spiral rollers which have suffi... elasticity to conform to any inequali... of surface; quiet running; oil equally ...tributed by the spirals, alternately, roll... being coiled in opposite directions; parallel rollers and races; suitable for heavy or light duty.

Boyer Suspension Bearings.

Suspension Roller Bearing Co., Sandusky, Ohio.

Types—Single row type combined radial and thrust bearings are made in 48 models varying in diameter from 10 mm. to 200 mm.; double row type made in 64 models varying in diameter from 10 mm. to 240 mm. Type G, from $1.10 to $11.

Features—Radial and thrust bearings combined; by virtue of the fact that the balls are placed in grooves in the lateral faces of the raceways, which are of equal diameter, the weight is distributed on all of the balls and not simply on the lower balls; dustproof.

Prices—Single row type, from $3 to $65; double row, from $3 to $90.

Whitney Roller Bearings.

A. C. Smith Co., Milwaukee, Wis.

Models—Made in all of the standard sizes for automobile work.

Features—Adjustable tapered cup and cone type; no shoulders or guiding members; cage not subject to load stresses.

SKF Ball Bearings.

SKF Ball Bearing Co., New York.

Carefully selected steel, careful selection and calibration of the balls, determination of their hardness and homodeneity, closely controlled processes in hardening and tempering the bearing races, accurate machine work, close grinding and finishing are claims by this company. Outer race has its inner surface concaved; inner race has two groves in outer surface, each groove of radius slightly larger than that of the balls; construction is designed to provide for self-alignment in case of deflection.

Timken Roller Bearings.

Timken Roller Bearing Co., Canton, O.

Tapered roller bearings for axles, shafts, knuckles, steering gears, etc.

Features—Tapered construction of rollers, cones and cups permits accurate adjustment for wear; ribs on cones and grooves in rollers keep the rollers always in their places; the utmost pains are taken in process of manufacture to ensure accuracy; special steels for each part, specially heat treated; heavy and light bearings for heavy and light duty.

United States Ball Bearings.

United States Ball Bearing Mfg. Co., Oak Park, Ill.

Bearings of all standard sizes for use under all conditions.

Norma Bearings.

Norma Co. of America, New York.

Ball and roller bearings, precision testing instruments, Hirth minimeters. Features claimed are accuracy, perfection of workmanship, superior design, efficiency, endurance and quality.

Schaefer Ball Bearings.

Barthel, Daly & Miller, New York City.

In all standard sizes for carrying radial and thrust loads.

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Features—Best of materials and workmanship.

Standard Bearings.

Standard Roller Bearing Co., Philadelphia.

Bearings, both ball and roller, of all sizes and for all classes of service.

New Departure Ball Bearings.

New Departure Mfg. Co., Bristol, Conn.

All standard sizes and in single and double row types.

Rhineland Ball Bearings.

Rhineland Machine Works Co., New York.

Ball bearings in all standard sizes for all classes of service.

SRO Ball Bearings.

Marburg Bros., Inc., New York City.

Ball bearings in all standard sizes.

TOPS AND BODIES.

Golde Tops.

Golde Patent Mfg. Co., New York City.

Models—Made in five models: Model 15E is 128 inches long; 15L, 111 inches; 15K, 103 inches; 15H, 94½ inches; 17, 67 inches. Any of the models is furnished either tapering oval steel rods, known as Equipment A, or with wooden rods and steel trimmings, known as equipment B; any model in either equipment can be covered with waterproof canvas, mohair or pantasote, and in colors to suit conditions. Wizard curtains are made to go with the various models.

Features—Supported only at two points; can be very easily raised by one person; lazy tongs principle upon which the frame is constructed ensures rigidity. Wizard curtains are arranged to be folded along the under side of the top and are folded up with the top.

Prices—Prices vary according to materials used.

Budd Pressed Steel Bodies.

Edward G. Budd Mfg Co., Philadelphia, Pa.

Made in various styles for both pleasure and commercial chassis.

Features — Indestructibility, non-inflammability, lightness, all joints welded, finish can be oven-baked and thereby made durable.

Hayes Metal Bodies and Parts.

Hayes Mfg. Co., Detroit, Mich.

Metal bodies, running boards, fenders, hoods, oil pans and various other sheet metal parts.

Longdin-Brugger Tops.

Longdin-Brugger Co., Fond du Lac, Wis.

Models—One model complete with curtains. Made in mohair. Set of seat and top covers for Ford cars also shown.

Prices—Top, $35; seat and top covers, $30.

Racine Bodies.

Racine Mfg. Co., Racine, Wis.

Metal pleasure car bodies. Among the newer types are a five-passenger sedan and a Colonial coupe.

FITTINGS IN GENERAL.

Flexible Metal Tubing.

American Metal Hose Co., Waterbury, Conn.

Made for conveying warm air to the carburetter in diameters increasing by eighths of an inch from ¼ of an inch to 2 inches; for exhaust gases in diameters increasing by quarters of an inch from 1 inch to 3 inches; in short lengths provided with rubber sleeves for use as lamp connections; in short lengths provided with air pump connections and chuck for inflating tires.

Features—Durable, easily assembled, for exhaust it is asbestos packed to withstand heat.

Prices—Warm air, from 24 cents a foot for the smallest diameter to 60 cents a foot for the largest diameter. For exhaust gases, from 40 cents a foot to $1.50 a foot. Lamp connectors, 20 cents; pump connectors, 25 cents a foot, and 60 cents for the couplers.

Soss Hinges and Die Castings.

Soss Mfg. Co., Brooklyn, N. Y.

Models—Invisible hinges are made in two models, No. 117 and 119, for automobile use. No. 117 has a non-separable post plate; on 119 the post plate is separable, consisting of a socket portion which prevents the ingress of water to the post, and the hinge bearing portion.

Features—Hinges are invisible when in place; can be used on either straight or curved doors; cannot rattle; have no projections to catch the clothing, and they carry the door outside of the opening, allowing use of the full width of between the jams.

Prices—117, $1.50; 119, $2.

Numotor Top and Cover Fabrics.

L. J. Mutty Co., Boston, Mass.

Numotor fabrics are made in single texture for seat covers and in double texture with Para rubber interlining for tops, colors to suit. Numotor leather is made of a single texture covered with leather. Imported and domestic mohairs, lustres, serges and twills also are stocked.

Features—Numotor fabric is made of combed cotton yarns dyed in the fiber so as to obtain a fast color. A special dye—Indanthrene—is used. The top covers are waterproof and all of the fabrics can be cleaned without being impaired.

Forged Automobile Parts.

Cleveland Hardware Co., Cleveland, O.

Line is divided into bow socket and forging divisions, the latter into special and standard forgings; stock of standard parts for cars is carried. Company urges economy of using product of this nature because of the cut in first cost due to greater production facilities of forging company as compared with those of ordinary car factory. List includes such parts as spring shackles, lamp brackets, spring clips, yoke ends, levers, pedal levers, connecting rods, steering arms, starting crank levers and others.

Duplex Brakes and Gyrex Mixers.

Royal Equipment Co., Bridgeport, Conn.

Duplex brakes made in six models, four external and two internal. Gyrex is made in a single model to fit in the induction pipe of the motor and break up the liquid molecules.

Features—Duplex brakes are equally effective whether the car is moving forward or backward; braking force exerted over the full area of the brake drum; no drag or chatter. Gyrex mixers are easily attached and effective.

Ajax Brake Lining.

Asbestos & Rubber Works of America, New York City.

Made in thicknesses increasing by 1/16 of an inch from ⅛ inch to ¼ inch and widths increasing by ¼ of an inch from 1 inch to 4 inches.

Features—Waterproof; grease and oil proof; acid and dust proof; will not harden.

Prices—From 33 cents a foot for the smallest size to $1.97 a foot for the largest.

Multibestos Brake Lining.

Standard Woven Fabric Co., Worcester, Mass.

Sizes—Made in thicknesses increasing by 10th of an inch from ⅛ to 5/16 of an inch and in widths increasing by quarters of an inch from 1 inch to 6 inches.

Features—Long life, unburnable, grips instantly.

Prices—From 33 cents a foot for the narrowest and thinnest size to $3.60 a foot for the thickest and widest size.

Wasson Piston Rings.

Wasson Pitson Ring Co., Hoboken, N. J.

Made in all sizes and diameters to fit all makes of motors. Special rings also are made.

Features—Rings are concentric with the pistons and cylinder walls and naturally are

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of equal thickness all around; resiliency is imparted to the rings after they have been finished to size by peening the inside surface in a special machine.

Connecticut Magnetos and Coils.

Connecticut Telephone & Electric Co., Meriden, Conn.

Models—Magnetos made in four models: Model A-4 is for use with four-cylinder motors; A-6, with six-cylinder motors; A-4 Dual is for dual ignition with four-cylinder motors; A-6 Dual is for dual ignition with six-cylinder motors. Dash box coils are made for use in connection with motor with one two, three, four or six cylinders in several different styles. Tubular dash coils are made either with or without switches.

Features—Magnetos are fully enclosed; strong spark at low speeds; durable.

Prices—A-4, $90; A-6, $100; A-4 Dual, $105; A-6 Dual, $115. Coils from $12 to $20. Tubular dash coils, with switch, $13; without switch, $10.

Truffault-Hartford Shock Absorbers.

Hartford Suspension Co., Jersey City, N. J.

Models—Made in four models: Standard, for cars weighing over 2,500 pounds; Intermediate, for cars weighing between 1,-800 and 2,500 pounds; Junior, for cars from 1,800 pounds to 1,800 pounds, and Juniorette, for cars weighing less than 1,200 pounds and for electrics.

Features—Frictional plates are self-lubricating and made of wear-resisting material; friction can be readily adjusted by shifting position of dial to give best results and compensation for wear. Pioneer shock absorbing device.

Prices—Standard, $60; Intermediate, $45; Junior, $25; Juniorette, $15, for a set of four.

Abell Tire Pump.

Standard Thermometer Co., Amesbury and Boston, Mass.

Type—Engine driven or electric driven for garage use.

Features—Ball-bearing drive; evaporated gasolines not become mixed with the air pumped into the tire. The pump has three cylinders and may be attached to the engine. The garage pump may be operated by a small electric motor attached to any electric socket. Pump for attachment to engine, weight, 6 pounds; price, $25. Attachments to apply to car, $5 to $10. Garage pump, weight, 40 pounds; price, direct current $80, alternating, $85.

Pantasote Coverings.

Pantasote Co., New York City.

Top covering tops, made in 23 different weights and finishes. For covering seats, made in six different weights and finishes.

Features—Uniform quality; not injured by exposure to sunlight or by grease or by changes of temperature; can be easily cleaned and is absolutely waterproof.

Prices—For tops, from $1.25 a yard to $2.05 a yard. For seats, from 90 cents a yard to $1.50 a yard.

Globe Tool Boxes and Parts.

Globe Machine & Stamping Co., Cleveland.

Thirty different models of tool and battery boxes for use on both pleasure and commercial vehicles; pressed steel fenders and body parts.

Features—Pressed one-piece covers; electrically welded seam and bottom; new style aluminum mats, and either brass, nickel or black enamel trimmings.

B-T-K Parts.

Auto Parts Mfg. Co., Muncie, Ind.

Gearsets, clutches, control levers and steering gears in several different forms. Two new types of unit power plant transmissions for 30-40 and 40-55 horsepower combinations, respectively, arranged for either left or right hand or center control and fitted with either cone or disk clutches. Dry plate clutches and cone clutches with springs under the leather are among the newer products.

Drop Forgings.

Chicago Drop Forge & Foundry Co., Chicago, Ill.

Rough drop forgings in the form of connecting rods, crankshafts, camshafts, steering knuckles, etc. The Hartsough connecting rod, which is readily adjustable simply by turning the bolt holding the lower half of the bearing, is put out in finished form and in a variety of shapes and sizes.

McCord Radiators.

McCord Mfg. Co., Detroit, Mich.

Vertical tube type, made to manufacturers' specifications.

Features—Effective whether used for pump or thermo-siphon circulation; free air and water circulation; large area of contact between tubes and fins; lightness and strength.

E-C Demountable Wheels.

E-C Sales Co., Chicago, Ill.

Types—Wood and wire.

Wire wheel, new product, removed by unscrewing ring and loosening sleeve; spokes are crossed, greater strength being claimed thereby; clincher tires only; claims are quickness of operation and simplicity. Wood wheel, on market about nine months, similar to the wire wheels.

Whitney Chains and Tools.

Whitney Mfg. Co., Hartford, Conn.

Types—Roller, block and silent chains are stocked in all sizes; hand and weight feed milling machines and tool grinders and Woodruff keys and cutters, Presto drill chucks, collets and friction tapping devices.

Features—Roller and block chains have deep side plates which add strength. Roller chains are made either in the detachable type or the riveted type; both types are interchangeable.

Raybestos Brake Lining.

Royal Equipment Co., Bridgeport, Conn.

Made in four thicknesses, increasing by sixteenths of an inch from ⅛ inch to ¼ inch, and in widths from 1 inch to 4 inches.

Features—Grips readily; not affected by grease, oil or water; durable.

Prices—From 32 cents a foot for the thinnest and narrowest to $1.88 a foot for the thickest and widest.

C. R. G. Carburetters.

C. R. G. Mfg. Co., Saugus, Mass.

Models—Made in a single model in all of the more common sizes.

Features—Multiple jet type with three jets each played in an individual venturi tube; only the low speed jet is adjustable, the others coming into action as the suction of the motor increases at higher speeds.

Westinghouse Motors.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Electric motors for pleasure and commercial cars; all sizes.

Enclosed type; minimum size and weight, and maximum efficiency and durability; motors developed especially for vehicle work by long experience; motors built to suit any conditions.

Non-Gran Bronze.

American Bronze Co., Berwyn, Pa.

Special bearing bronze which is made not only in ingots, but in cored bars which are readily machined to make bushings.

Features—Will not metallize oil; gives excellent results in actual service; extremely convenient form for shop use; minimum waste in making cored bars into bushings.

Valentine Varnishes.

Valentine & Co., New York City.

Superfine colors, wood fillers, top-dressing, Celox primers and sealers, Vanadium varnishes, color varnishes and chassis finishing, are made.

Features—Transparency, fluidity, quick drying, dry through, brilliancy, durability, uniformity, economy.

Janney-Steinmetz Tanks.

Janney, Steinmetz & Co., Philadelphia, Pa.

Seamless, cold drawn steel tanks for use as fuel containers and air and gas containers, in varying shapes and capacities. Gasolene and oil storage systems supplied with

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welded seamless tanks, as well as pressed brake drums, also are stocked.

Springfield Metal Bodies.

Springfield Metal Body Co., Springfield, Mass.

Aluminum bodies in all the ordinary types, and a full line of convertible bodies, which, used in conjunction with special convertable tops, serve to make closed bodies of the open models.

Vulcan Drop Forgings.

J. H. Williams & Co., New York.

Crankshafts, connecting rods, valve stems, igniter levers, rod ends, yoke ends, thumb nuts, spark plug wrenches, lathe dogs, clamps, caliper gauges, hammers and other parts and tools. Iron, steel, copper, bronze and aluminum are used.

Franklin Die Castings.

H. H. Franklin Mfg. Co., Syracuse, N. Y.

Various styles and sizes of die cast bearings and bushings made of Franklin babbitt alloys; also parts for magnetos, pumps, and electric lighting systems.

Features—Cheapness as compared with machined parts.

Gray Iron Castings.

Manufacturers' Foundry Co., Waterbury, Conn.

Cylinders, pistons, manifolds and other parts; gray iron of a high quality is used and ability is claimed to produce high-grade and uniform work with most intricate designs.

Linde Shims.

Linde Shim Co., New York City.

Shims for adjusting connecting rod bearings made up of an infinite number of very thin brass sheets sweated together under pressure; sheet at a time can be removed to adjust the shim to the needs of the bearing.

Cowles Trimmings and Mountings.

C. Cowles & Co., New Haven, Conn.

Door handles, robe rails, foot rests, top standards and props, curtain fasteners, curtain rollers, window lifts, body moulding, speaking phones, annunciators, locks and hinges, lamps, switches, and toilet articles.

Electrical Apparatus.

General Electric Co., Schenectady, N. Y.

Battery charging sets, mercury arc rectifiers, motor-generator sets, meters, switches, vehicle motors and controllers, tungsten lamps and cloth pinions all made in a variety of different models.

Spicer Universal Joints.

Spicer Mfg. Co., Plainfield, N. J.

Encased universal joints for transmitting all powers.

Western Drop Forgings.

Western Tool & Forge Co., Brackenridge, Pa.

Crankshafts, camshafts, connecting rods, I-beam front axles, steering arms and knuckles, lamp forks, spring hangers and other parts and tools.

McCue Axles.

McCue Co., Buffalo, N. Y.

Drop forged, I-beam section front axles are made in six models for cars weighing up to 4,000 pounds. Ten models of rear axles are made for cars of all weights up to 5,000 pounds.

Cleveland Worm Gears.

Cleveland Worm & Gear Co., Cleveland, O.

Several different types of worm gearing, as well as worm gearing assembly. The gears are made of imported steel and ground to finish.

Priming Cups and Fittings.

Edelmann & Co., Chicago, Ill.

Priming cups, relief cocks, radiator drain cocks, grease cups, screwdrivers, gas tank couplers and reducers, oil gauges, hydrometers, in a variety of different models.

Wells Screw Cutting Machinery.

Wells Brothers Co., Greenfield, Mass.

All types of screw cutting machinery, taper pin reamers, burring tools, standard and limit gauges. Especial attention to tools suitable for A. L. A. M. standards.

Imperial Fittings.

Imperial Brass Mfg. Co., Chicago, Ill.

Lubricators; gasolene, oil and water pumps; gasolene and water manifolds; priming cups and cocks; valves, accelerator pedals and other brass goods.

Baldwin Steel Castings and Steel.

Baldwin Steel Co., New York City.

Clay crucible steel castings, gears, cylinders, crankshafts, axles, sprockets, gear blanks, etc., as well as bearing steel, magnet steel, chrome, nickel and vanadium steels.

Doehler Die Castings.

Doehler Die Casting Co., Brooklyn, N. Y.

Bearings, bushings made in a variety of forms and sizes to fit all motors; a feature is the babbit lined bronze bearing. Die castings made for light manufactures.

Mondex-Helix Gas Mixers.

Aristos Co., New York City.

Models—Made in two sizes for use with 1¼-inch and 1½-inch carburetters. Both models are similar in detail.

Chrome Vanadium Steel Products.

Carnegie Steel Co., Pittsburgh, Pa.

Products illustrating the scope of application of several grades of the Carnegie Co.'s products and illustrating tests for various grades of steel.

Parsons White Brass.

Wm. Cramp & Sons Ship & Engine Building Co., Philadelphia, Pa.

Bearing metal, castings of various shapes and sizes for use in connection with all makes of motors.

Krupp Steels and Products.

Thomas Prosser & Son, New York.

Steels and completed steel parts made by Fried. Krupp, cast steel works, Essen, Germany; consists of axles, crank pins, and steel forgings.

Carpenter Steels.

Carpenter Steel Co., Reading, Pa.

Chrome Nickel steel for use in gearsets and Sampson Nickel Alloy steel for use in axles, gears, steering knuckles, spindles, etc.

Steel Tubing.

National Tube Co., Pittsburgh, Pa.

Steel tubing in a variety of sizes and cross-sections for use in windshields, cylinders and axles, etc.

Rielly Trimming Leathers.

P. Rielly & Son, Newark, N. J.

Patent and Enamel top and trimming leathers in all weights and colors for upholstery work.

Fans.

Sparks-Withington Co., Jackson, Mich.

One piece stamped steel fans of all sizes and various types and shapes.

Top Fabrics.

L. C. Chase & Co., Boston, Mass.

Mohairs, twills and special covers in all weights and colors.

Chains and Sprockets.

Baldwin Chain & Mfg. Co.,Worcester, Mass.

Lock Nuts and Bolts.

Columbia Lock Nut & Bolt Co., Bridgeport, Conn.

Paints and Colors.

Willey Co., Long Island City, N. Y.

Valves and Fittings.

Burke Valve Co., Cleveland, O.

Dynamometers.

Joseph Tracy, New York City.

Lock Nuts.

Grip Nut Co., Chicago, Ill.

Steels.

Fisher Steel & Iron Works Co., Switzerland

Metal Trimmings.

English & Mersick, New Haven, Conn.

Drop Forgings.

H. A. Elliott, Detroit, Mich.

Metal Stampings.

Metal Stamping Co., Long Island City, N.Y

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REILLY'S APPRAISAL OF DEALERS' LITERATURE

Points Out Wherein Manufacturers' Printed Matter Is Invaluable to the Dealer—How It May Be Used to Advantage—Each Folder or Booklet an Educator or Salesman.

"I think we ought to do something with it, change it in some way or else discard it entirely; it doesn't seem to be much good now," remarked the Sales Manager as he sat in Reilly's office and looked thoroughfully at the latest copy of the company's dealers' bulletin which he had picked up from the city dealer's desk.

"No hope for it at all?" asked Reilly.

"I don't know; there must be some way out of the problem, but I don't believe more than three dealers out of ten ever read it and I'll bet that three out of every ten only look at it throw it away as soon as they run through it," was the salesman's answer.

"Did they never read it?"

"I'm not sure of that, either," continued the Sales Manager. "This much I do know: We sent out a request to the dealers in this district a short time ago, asking them to send in certain information, and the responses were so few and unsatisfactory that it surprised me. I always supposed the dealers were alive to the value of the factory's literature but I never had much authentic information on the question until we unknowingly made this test. We never intended it as a test, either; we really wanted the information."

The Dealer's Attitude Questioned

"I don't believe it's all the fault of the dealer," commented Reilly. "It contains valuable information and if it isn't read I can't see why the attitude of the dealers is what needs altering."

"Maybe you're right," responded the Sales Manager. "But supposing you are, what then? How are you going to alter the dealers' attitude?"

"That is another thing," answered Reilly. "But I wouldn't blame the innocent bulletin as not to blame for the shortcomings of those who are supposed to read it."

"Do you read it?" questioned the Sales Manager.

"Do I? Look here!" and Reilly pulled out a drawer in his desk and presented for the inspection of the Sales Manager a series of bulletins dating back for months. The Sales Manager's look of gratification had not spread over a radius of more than two inches when Reilly pulled from another drawer a file of advertising matter, booklets, catalogs and pamphlets and then he called to the office girl, "Nellie, will you bring the back file of bulletins?"

The young woman entered shortly with files of still earlier dates and the whole display was presented for the inspection of the factory man. Such co-operation with the factory was not surprising in this case but it certainly was pleasing and about all the Sales Manager did was to beam his pleasure.

"I read every one of them," said Reilly. "I read every booklet and every piece of literature you get out and when I haven't much else to do I often pull out the bulletin file and read the back numbers. I wouldn't miss doing it for anything. It's worth a lot of money to me."

Inattention to Factory's Messages

"Then you think it's same good?"

"I certainly do," asserted Reilly, "it is invaluable to me. The principal trouble with your problem is that the dealers don't realize the value it can be to them. They are not only handicapping themselves as dealers in your cars but they are disrespectful to the factory. Supposing you had all the dealers gathered at a meeting where the president of the company was to tell them something he especially wished them to know; supposing three out of ten listened while the other seven read newspapers or paid no attention; supposing three out of the ten who did listen remembered what the president said while the other seven straightway proceeded to forget it. Can you conceive such a thing?

Likening House Organ to Personal Caller

"No, you can't, and neither can I. But that is just what occurs in another way, if what you say about your bulletin is true. This publication is nothing more nor less than a message from the house to the dealer, and is sent with as much earnestness as it would be if personally delivered; if the house has nothing to say it wouldn't put it in the bulletin, and whatever is in the bulletin the dealers ought to realize is there for some purpose."

"That's an excellent way of looking at it," agreed the salesman.

"Well, that's viewing the sheet from the factory standpoint. But what is more important to me and every other dealer is the dealers' standpoint. It is safe to assume that every dealer wants to be a better dealer; he wants to be able to sell more cars and to be a better salesman and business man in general, and if you asked any one of them if this wasn't the case he would almost be offended to think that he was suspected of being without such a desire. But what do many of them do? In the case of the bulletin, it is sent out to help the dealer; it contains information that is supposed to be of assistance to him, yet many of them ignore it. If a factory expert came to him and offered to assist in any way the dealer would grab the opportunity, but when the help comes in an envelope with a stamp on the outside he passes it up.

"The delinquent dealer doesn't realize what is in this bulletin. In many of them are answers to little problems that have been worked out by the factory engineers. There are many little things that the engineers discover and that are incorporated in the publication which the dealer never would think of or find out if he did think of them and were left to figure alone. The engineers are the men who have built the cars; they know the reason for what is in every inch of them from the ground up and that is a knowledge that no salesman ever can hope thoroughly to gain, unless he takes a mighty long course in engineering.

Gaining Valuable Selling Knowledge

"A salesman or dealer knows the cars quite thoroughly, but when it gets down to the fine points of construction he begins to be lacking. Many of these constructional details are good selling points; they show a prospect that there is thoroughness back of the car, and while they may be quite technical in many cases, they are worth saving up to use in the right place."

"And we send out points in general salesmanship, too," interrupted the Sales Manager.

"That's all good, also," continued Reilly. "A great deal if it is this punchy, gingery kind of stuff that is supposed to give a man an incentive and to keep him on edge, and much of it is stuff that any good salesman already knows, and for that reason some of these car sellers stick up their noses at it and say, 'Huh, anybody knows that stuff.' Which is very true, but—there is this often unthought of habit of man of

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letting good things become stored away in the attic of his idea house; if he sits down and thinks they will come out, but a little dusting off now and then does them good.

"Any kind of selling or merchandizing talk in any form is good. It isn't necessarily new, but it serves to arouse dormant ideas, and right there is a vital principle. The salesman who says, 'Huh, anybody knows that,' never stops to think that while he knew it he had temporarily forgotten it and that the little reminder, the 'stuff he knew' has made available for his use some dormant idea that was uselessly stored away in a deep wrinkle of his brain where it was no good. He knew it was good when he put it there but he had forgotten it was there."

"That's a new idea to me," exclaimed the Sales Manager, "and I'm going to put it in a personal letter to every dealer to see if they won't wake up."

Co-operating with the Manufacturer

"While you're at it," added the dealer, "you might also suggest to them that they regard these bulletins as personal letters; that's what they are. The house would like nothing better than to get its dealers together every week or two for a conference and instruction, and since it can't do this, it tries to get them together through its house organ. Also, the dealers can do much good by helping get out the bulletin. Every dealer has an idea or selling scheme of his own, something that no other dealer has thought of, and if all would get together and send these in to the factory and the factory would spread them around among other dealers, what a swapping of stuff there would be. Every dealer then would have the use of the brains of the whole selling field. Two heads, they say, are better than one, and the whole group of heads ought to be a winner."

"So many dealers have said they are so busy they neglect the house bulletin," suggested the Sales Manager.

"Yes? Well, let me draw a comparison. Every dealer on your list is busy, I presume, but he reads the newspapers, doesn't he? And how much time does he put in at it? Supposing there is a big scandal in New York or Chicago or San Francisco, he reads it, I'll bet—I do myself. He will put in fifteen or twenty minutes on a good newspaper story; but which is worth the more to him: the fact that there was a big murder five hundred or a thousand miles away or the fact that the house has discovered something original in selling or, perhaps, has made a big sale in some city, perhaps in the same town where the scandal or more was? Common sense will demand an answer in favor of the latter. Also the newspaper comes every day and the house organ once a week or once a month. It takes not more than twenty minutes to read the house paper all through, and when a house publication can't compare with a daily newspaper for value or information, there is something the matter with the house sheet or with the estimate of the dealer. I'll bank on the house literature every time."

"We spend a mint of money on printed stuff," asserted the Sales Manager.

Dealer Who Kept Literature Barrel

"And a big per centage of it's wasted," said Reilly, finishing the statement. "Dealers as a rule don't realize what the factory is trying to do for them with its advertising matter. A manufacturing company makes a study of its line and its selling problems and goes to great trouble and expense to get up a line of booklets and leaflets, every one of which is intended to be a hot shot that will have telling effect if properly used. The advertising department sends this material to the dealers and some of the dealers are wise enough to realize the value in it. Others dump it in a back room.

"I know one dealer right here in town whose company plans to keep him well supplied with a high-grade line of advertising matter, but he regards it as junk and treats it from that standpoint. I was in his basement one day and saw a barrel nearly full; I asked him what he did with it and he said he sold it to a junk dealer as soon as the supply was big enough to weigh anything at all. This man doesn't understand the principles of merchandizing, he doesn't know human nature and he is too bigoted to let any helpful information seep into his head.

Booklet Often the Better Salesman

"If he had been schooled in the right way he would know that advertising literature properly used can do many times more on certain occasions than any salesman can do, because it can go with a man to his fireside and talk with him when he is in a mood to listen; it is a little unobtrusive salesman that often will accomplish wonders and worm its way into difficult places in a surprising manner. And again, if the company, which certainly knows something about selling, sees fit to put a small fortune into advertising literature it ought to make a dealer at least suspect that there was some object in the doing; and a little investigation should show him the answer.

"If a dealer does get something of value he also should pass it on to his salesman, mark the important passages, point out the good stuff and send it along to the salesman, that he, too, may benefit by it. Hogging knowledge is foolishness; it's something that can't be cornered, and the more your employes know the better it is for you."

"Co-operating with the factory in the literature line is no more than right, any way. When the factory asks through the bulletin for certain information or that the dealer do certain things he should regard it as if the request came in a personal letter and to him alone. The company is trying to make its force more efficient, is anxious to help its dealers, and if there is co-operation there is bound to be progress; and if every dealer jumps in and they all pull together, each one is certain to be carried along toward greater success, how much greater depends upon how much co-operation he puts in; it's up to him.

"These booklets are worthy of study; they are put out for a purpose. Each of them is suited for a certain class of prospect, just what class I can determine from a study of the booklet; and when I have a prospect whom I think will be helped by a little literature, if I know what my stock contains, I know just what to send him."

"Some of our best dealers, Reilly, don't seem to think they need any help and don't seem to care to help us."

All-wise Man Travels Backward

"Well, without throwing any bouquets," answered Reilly, "I think I am safe in saying that I have as good a business as the average dealer and I hope I never see the day when I don't need assistance of some kind. The man who gets wrapped up in himself and becomes imbued with the idea that he is all there is to it and that he is beyond being benefited by anything or anyone, is in bad shape. He is on the backward road, and for two reasons; one is that he is relying upon his own ability and ideas, and these are likely to become shopworn; the other is that those who take from the experiences of others and who are willing to be helped will go by the other man so fast that he will at least appear to be going backward."

Reilly stopped talking abruptly as he saw passing the window a grocery wagon with several Christmas trees sticking out the back end. "Gee, I almost forgot," he exclaimed, as he slapped his knee. "Order me a Christmas tree, a cedar, will you?" he asked the office girl, as he stepped to the door of her little office.

"Better not get cedar," she said. "My sister bought one and it was all covered with some kind of little bugs; she sent it back and all the cedars she could find were the same way. She took some other kind."

"Order something else, by all means," agreed Reilly; "Mrs. Reilly says I'm bugs enough for one house."

"Your wife is very discerning, isn't she?" was the Sales Manager's comment.

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STOCK CHAMPION



National

Improved Series V.

INTERNATIONAL CHAMPION



Money Cannot Buy Better Materials Nor More Elegant and Completely Equipped Car

Long stroke (4⅞ x 6) flexible and noiseless Motor with enclosed valves.
Left Side Drive.
Center Control.
Gray & Davis Electric Starter, easily operated by simply touching a button with foot.
Gray & Davis Dynamo Electric Lighting System.
Bosch dual double Magneto.
12-inch Turkish Upholstery.
Full heavy nickel Trimmings.
Electric Horn.
Adequate Baggage-carrying Compartment concealed in body but easily accessible.
Powerful and reliable Brakes.
Spacious Interior.
Tire Pump, integral part of motor. Inflates a tire in three minutes.
Truffault-Hartford Shock Absorbers on rear.
128-inch Wheel Base.
Gray & Davis 12-inch black and nickel bullet head lights.
Adjustable, ventilating and rain vision Wind Shield.
Multiple jet Carburetor.
Hoffecker steady-hand Speedometer.
Tire Carrier in rear.
Silk mohair Top, Cover and Curtains.
Full-floating Rear Axle.
Resilient Springs, ¾ Elliptic in rear; Semi-Elliptic in front.
Large gasoline pressure-feed Tank with Gauge in rear.
Robe Rail and Foot Rest.
Foot Mat in Running Board.
Plain, continuous enclosed Metal Guards.
Easy riding qualities, unexcelled.
Oiling System, demonstrated to be only perfect oiling system.

Tools and jack in box concealed by splash on running board.
One extra Firestone demountable rim.

These few features are typical of the National's superior quality



Five Passenger Touring Car
One of five models, $2750 to $3400

Write for catalog

National Motor Vehicle Company, Indianapolis, Ind.

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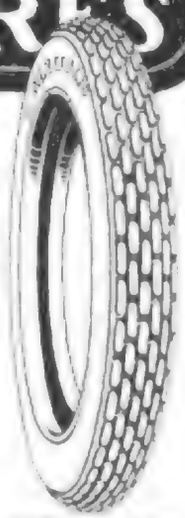
REPUBLIC STAGGARD TREAD TIRES

Ride in safety over slippery pavements

You men who are often compelled to "let her out" can indulge in bursts of speed with less fear of skidding and slewing.

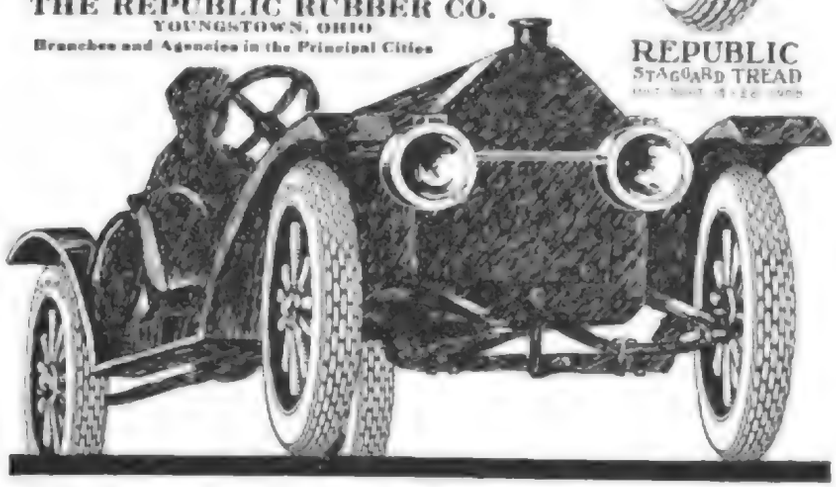
The long, sturdy studs (six rows of them) in the Staggard Tread Tire give your car a good "purchase" on slippery pavements and make skidding an almost negligible factor.

There's extra mileage in the Original, Effective Non-skid Tire, too. The studs form an extra tread over the ordinary, plain tread so that you really have two wearing surfaces.



REPUBLIC
STAGGARD TREAD

THE REPUBLIC RUBBER CO.
YOUNGSTOWN, OHIO
Branches and Agencies in the Principal Cities



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JUST PAWS

Hands weren't intended for pawing around in the dirt and mud. Yet that's what they must do when cranking a car in the old way. Do you like it?

LBA

STORAGE BATTERIES

with Electric Starting Outfits afford relief from cranking troubles and will also light your car. Just a push of the button will do either. But, *examine the Battery* and

BE SURE IT'S AN

LBA

Use the Class A LBA Battery with an Electric Lighting Generator
Use the Class B Battery with an Electric Self-Starter

Write us for full information

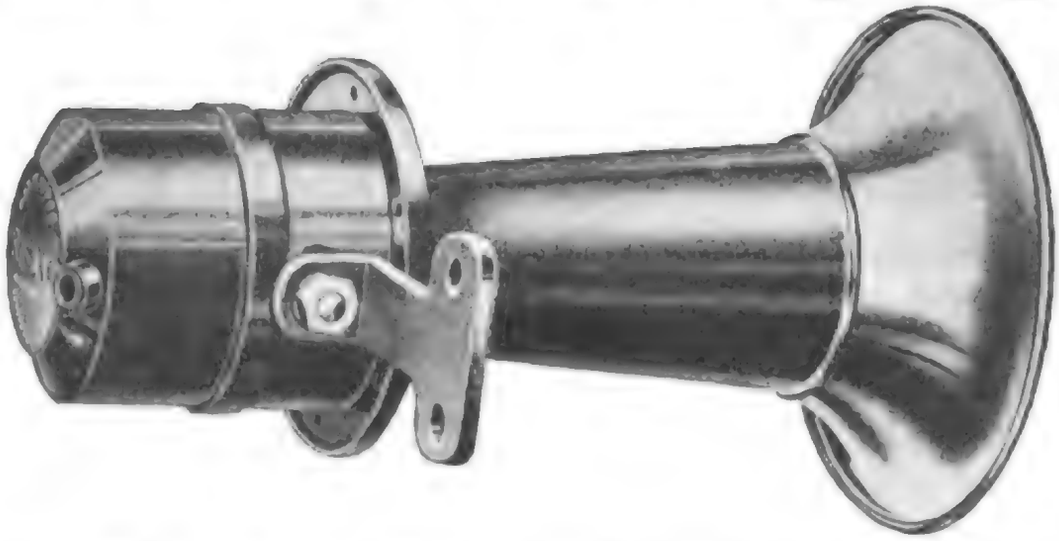
Willard Storage Battery Company
CLEVELAND, OHIO

New York Branch—136 West 52d Street Detroit Branch—1191 Woodward Avenue Chicago Branch—2241 Michigan Avenue
San Francisco Branch—243 Monadnock Building

Depots in All Principal Cities in the United States, Canada and Mexico

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Elyria-Dean Warning Signals



The Electric Warning Signal will be standard equipment on practically every automobile marketed in 1913, and most of the earlier models will be brought up-to-date by the installation of an efficient electric horn by the car owners. We know this to be a fact for our mammoth sales of the TUTO, TUTO-ETTE and REXO Electric Horns to automobile manufacturers and jobbers is the most conclusive evidence.

45,000 REXO Electric Horns of special design are specified by one car maker, the largest electric horn order ever placed.

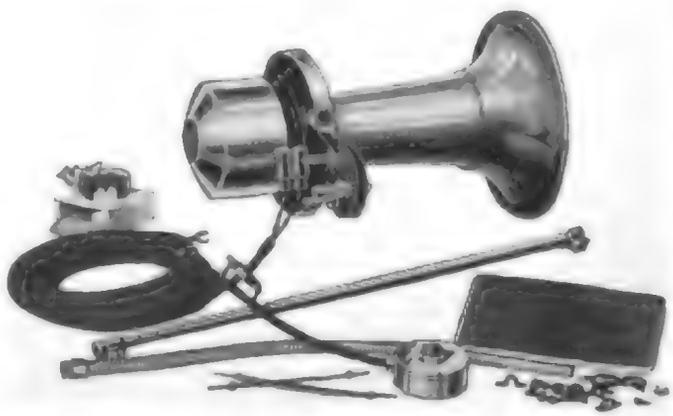
Thirty (30) other makers (at this writing) have standardized on the TUTO, TUTO-ETTE or REXO warning signals, requiring a daily factory output of 1,000 horns.

The ELYRIA-DEAN line of electric warning signals is complete, comprising the two-tone, one button operated, TUTO and TUTO-ETTE horns and the one-tone, trouble proof REXO Horn.

The TUTO Horn is well known throughout the world as the only double service electric warning signal, with a low note for emergency purposes—the latter obtained by merely increasing the pressure on the one button. It comes complete with everything ready for installing, including special steering column fixtures, and sells for $25.00.

The TUTO-ETTE is a smaller edition two-tone horn that sells for $17.50.

The REXO is made in the same factory and employes features which have made the TUTO horn so successful. It is a single tone horn, instantly responsive and of uniform intensity. It is free from constant care and most effective for emergencies, yet is not too loud for regular service. Our mammoth output makes a low price possible—complete with button and cord, $8.00.



Manufactured only by

THE DEAN ELECTRIC COMPANY

Kansas City ELYRIA, OHIO *San Francisco*

"Look for ELYRIA-DEAN where quality's seen"

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Elyria-Dean Ignition Systems



High frequency, high tension electrical discharges are used in the new ELYRIA-DEAN Ignition Systems instead of the ordinary high tension discharges, which is employed in all others.

This is the new system which has created such favorable results on modern power plants. It gives a new breath of life and "extra ginger," which is so much sought for by the car purchaser.

The high frequency spark differs from all other ignition sparks as it is oscillatory in character, 500,000 to 1,000,000 cycles per second.

It ignites the gas in a different manner, by ionizing, embracing a larger volume and giving more rapid and complete combustion, even of poor mixtures.

Wide spark plug gaps are permissable, 1/16 to 3/32", and the disruptive action of the spark prevents fouling of the plugs. Under average conditions, plugs never have to be removed, unless for mechanical breakage.

High cylinder pressures have less effect on this spark than on the other ignition sparks.

Invisible heat rays, incidental to the high frequency discharge, get in very helpful action and assist in making the combustion rapid and complete.

It allows the lowest of motor speeds without missing—running on the magneto current.

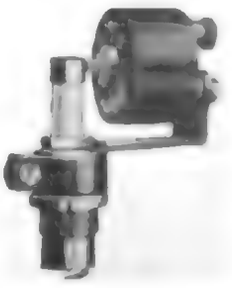


"Self starters" are made successful on magneto ignition as effective sparks are obtained at very low speeds, below 50 R. P. M.

All wiring carries low voltage currents, as the little resonator coils at the plugs step-up the pressure just where it is used. This obviates leakages and the maintaining of high insulation in the magneto, switch and connecting wiring.

It is a perfected product, the outgrowth of the many thousands of successful High Frequency Systems which have been marketed by the High Frequency Ignition Coil Co., of Los Angeles. Many of these systems have been in use for five or six years, and are still giving satisfactory service.

The exclusive manufacturing license has been granted us under the Seeley patents and pending applications, giving us the legal rights and only practical methods of applying high frequency currents to automobile ignition.



Manufactured only by

THE DEAN ELECTRIC COMPANY

Kansas City ELYRIA, OHIO *San Francisco*

"Look for ELYRIA-DEAN where quality's seen"

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Elyria-Dean Speedometer



The ELYRIA-DEAN Speedometer is the most simple and permanently accurate speed measuring mechanism yet devised.

It operates on the unvarying principle of centrifugal force, direct, and without being hampered with compensating gears, springs, etc.

The action is the same on the coldest winter day as in the heat of summer, and without the use of temperature regulators or hand operated compensators.

The speed indications are obtained by four large steel balls, the same as used in the anti-friction bearings of an automobile, operating radially in grooves by centrifugal force, raising a cup shaped member which responds to the slightest increase in speed, whether the car is going forward or in a reverse direction.

The shape of the cup is such that a long scale of uniform division is obtained, direct. No approximating or doctoring of the scale is necessary.

The hand is steady, it shows the speed at a glance by its position and without the necessity of deciphering the figures or markings, yet the latter are larger than usual for a speedometer of the same diameter.

The dial is black with white markings, the case beautifully finished in baked black enamel with nickel trimmings.

The Odometer is the reliable Geneva type of movement with the trip re-set to any tenth mile, so as to follow guide book markings.

It always adds mileage, never subtracts, regardless of how the car runs, whether forward or backward, or whether the shaft is driven from the right or left hand wheel.

There is nothing radically new or untried in the ELYRIA-DEAN Speedometer. The centrifugal principle was perfected in the FORSE Speedometer (we are exclusive licensees under the FORSE patents).

Every detail has been so nicely perfected that the complete instrument is in strict keeping with the finest made and most luxurious automobiles.

The ELYRIA-DEAN has real speedometer value, easy reading, steady hand, permanent accuracy, great strength in mechanism and neatness of design and finish.

Manufactured only by

THE DEAN ELECTRIC COMPANY

Kansas City ELYRIA, OHIO *San Francisco*

"Look for ELYRIA-DEAN where quality's seen"

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Elyria-Dean Electric Starting and Lighting Systems



Car manufacturers and automobile owners have had just enough experience with electric lighting and starting systems to realize their superiority over all other forms of illumination and cranking—also that the mere collection of dynamos, motors, and batteries do not constitute a well balanced equipment which will operate with the minimum amount of attention.

The dynamos, motors and even the batteries must be especially designed for automobile service and so arranged that the wiring and switching is reduced to the smallest amount.

It has taken us several years to commercially adapt this apparently simple electrical equipment to automobile service. Machines, regulators and switching devices which are perfectly adapted for stationary use have no place on the automobile. This is also true of any regulating mechanisms which require constant care and attention.

The majority of car owners fail to give the necessary attention, therefore the need of simplicity.

The ELYRIA-DEAN electric starting and lighting systems have been produced with this knowledge in view.

The ELYRIA-DEAN product includes the very compact and simple DYNALUX lighting system, the ELYRIA-DEAN separate unit dynamo and motor starting and lighting system, and the OTTO fly wheel starting and lighting system.

These equipments have been designed for distinctly different conditions, so as to give the car maker something which will exactly fit his job.

Manufactured only by

THE DEAN ELECTRIC COMPANY

Kansas City ELYRIA, OHIO *San Francisco*

"Look for ELYRIA-DEAN where quality's seen"

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We will sell you absolutely on

GILMER TIRE-REPAIR PLIERS
PATENTED TRADE MARK



In less than three minutes if you'll but come to our exhibit, Space 639 Madison Square Garden

That, substantially, is all we want to do in this advertisement—assure your getting to our exhibit. If you'll just come that far towards our proposition we will agree to do the rest.

So let us emphasize again our urgent request that you drop in on us for just about three minutes. We guarantee to make that three minutes profitable for you even if we don't sell you on Gilmer Tire Repair Pliers to the extent of your buying.

We will surely convince you that this little device is the most practical destroyer of tire expense that has ever been placed on the market—and if you'll let us show you that, we don't care whether you buy or not.

So again, please, don't miss us for a paltry three minutes, at Space 639, Madison Square Garden.

G. WALKER GILMER, Jr.

52 North Seventh Street *Philadelphia, Pa.*

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1913 Locomobile

Twenty new designs of bodies of the belted-line type with Cowl Fronts. Smooth Sides. Concealed hinges and door handles.

Locomobile Ten-Inch Upholstery

Clear Running Boards. Tires at rear. Costliest, most powerful Electric Lighting with Lamp designs of Exclusive Merits.

Long Stroke Motor. 7-Bearing Crank Shaft. Four Speeds. Disc Clutch.



Light Six Touring Car on the Mohave Desert Southern California

The 1913 Locomobile Book mailed on application

The Locomobile Company of America

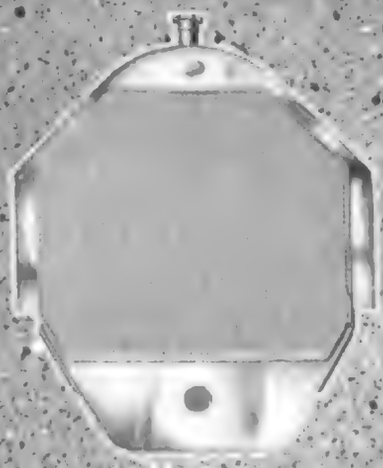
Branches
New York Chicago Boston
Philadelphia Pittsburgh
Washington St. Louis

Motor Cars and Motor Trucks
General Offices and Works
Bridgeport, Conn.

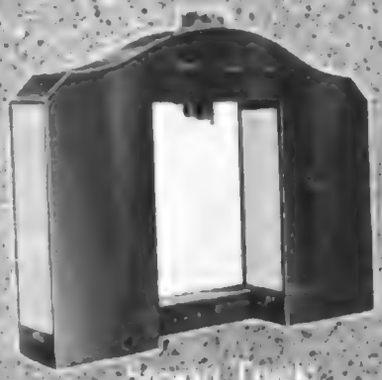
Branches
Baltimore Minneapolis
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San Francisco Oakland

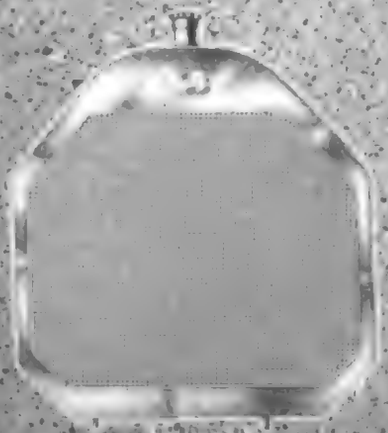
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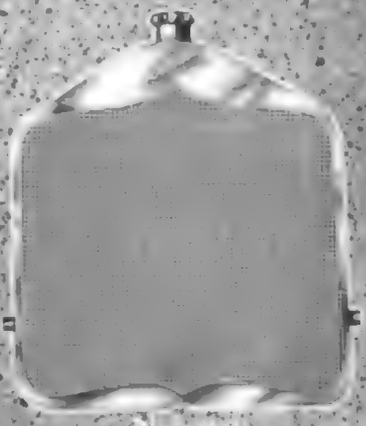
FEDDERS





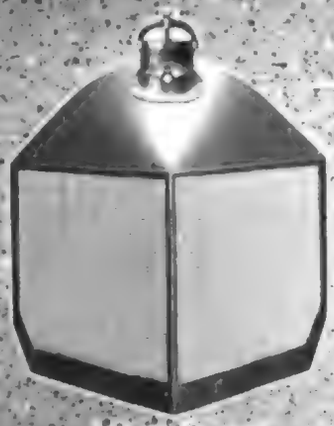






Fedders
Buffalo,

RADIATORS



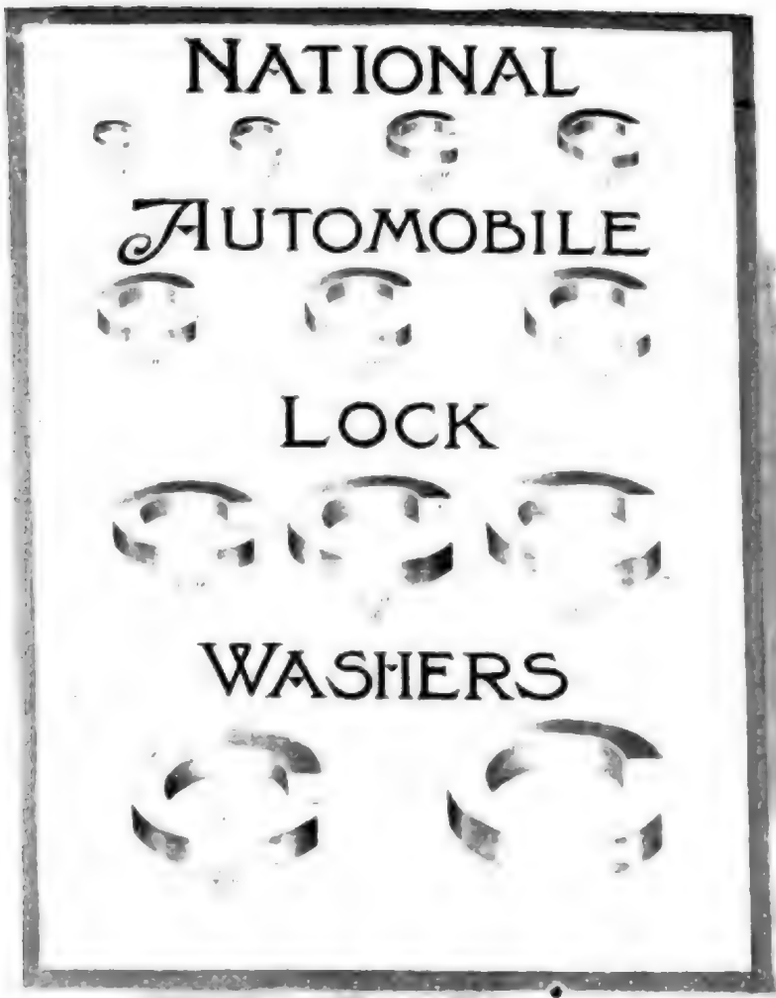








Manufacturing Co.
New York.



Above Sections and Pattern Have Been Adopted by the Society of Automobile Engineers

Width of sections gives maximum frictional bearing, when Lock Washer is pressed flat. Height of sections gives spring pressure to hold nut under all service conditions—also to maintain a tight joint against wearing to closer fit of unmachined parts.

NATIONAL LOCK WASHERS

are used on the majority of America's good cars—because quality car designers know that in the big combination of little quality parts lies the integrity of the finished product.

We are prepared to make prompt deliveries on all bolt sizes—no matter how large or how varied the order. Prices consistent with standardized quality.

Send for tables of sizes—also tests recommended by the S. A. E. Standards Committee, as accepted by the Society.

THE NATIONAL LOCK WASHER COMPANY
CHICAGO, ILLINOIS NEWARK, NEW JERSEY

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Non-Carbon Starter

The STARTER WHICH REALLY STARTS

Manufacturers—Dealers—Owners

YOU who have not investigated the NON-CARBON Starter will find it to YOUR interest to do so.

The NON-CARBON Starter is not a cheap Starter; nor a high priced Starter misrepresented.

The NON-CARBON Starter is pronounced the ULTIMATE Starter, by its users.

Listen! The NON-CARBON Starter is fundamentally different. Lay aside your prejudice. The Non-Carbon Starter is the one success.

It contains a real Non-Carbon MIXER.

The Starter forces **air** into the cylinders with only a very small per cent of acetylene. We want it positively understood that the NON-CARBON Starter does NOT force pure acetylene into the cylinders, which will ignite only occasionally and form a great amount of carbon.

Each cylinder receives an equal amount of highly explosive mixture, forming a complete combustion, which has been prepared by the Non-Carbon MIXER.

As a result, the NON-CARBON Starter is the one Starter which Starts the motor **every time** a spark enters the cylinder, regardless of temperature. The NON-CARBON Starter is a real Starter which Starts and not a Starter by name only.

It produces absolutely no carbon; is positively non-injurious to the motor. **Also, when gasoline is exhausted, the Non-Carbon Starter will actually propel your car.**

GUARANTEED TO GIVE SATISFACTION

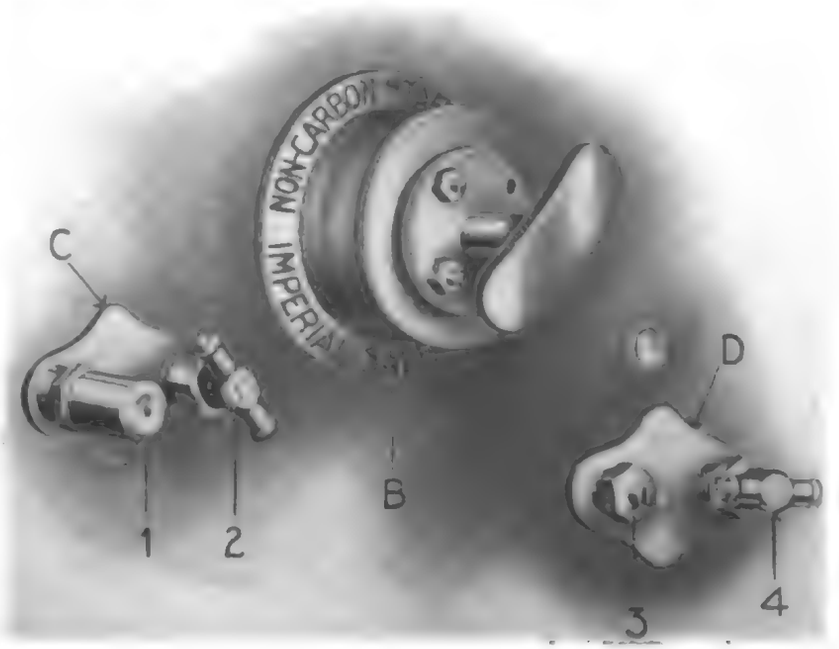
Easily Operated **Readily Installed** **Dependable**

$30 for a Four Cylinder Starter **$40 for a Six**

Live Dealers Are Given Exclusive Territory

Dealers, you can recommend a success, not an experiment. If you are in territory which you do not KNOW has been contracted for, write us.

Owners, send us your order with check for Non-Carbon Starter; name of car, model, number of cylinders; and name of dealer with whom we can make arrangements for installation, and you will receive a Starter which will give satisfaction, or money refunded.



Imperial Sales Company

TIFFIN, OHIO

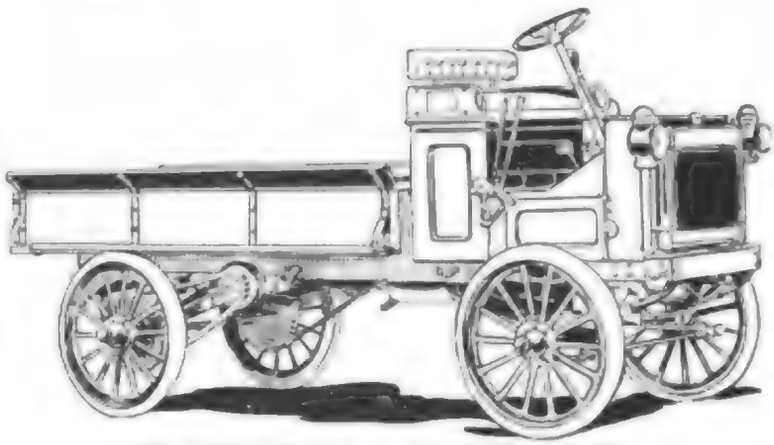
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SPRINGFIELD


Convertible
Bodies.
SPRINGFIELD METAL BODY COMPANY
Springfield, Mass.
AUTOMOBILE
SHOW

Sanford

Chassis With Driver's Seat and Dash $1,660



Stake or Express Body $1,750

THE TRUCK BUILT BY TRUCK SPECIALISTS

A motor truck to be permanently popular must be lastingly good. Sanford trucks are built lastingly good and are, therefore, popular.

Throughout Sanford construction, accessibility, standardization and durability have been carefully considered. All the bolts and nuts are standardized throughout and front and rear wheels, hubs, bearings, etc., are interchangeable. The loading space is large but the wheelbase is short, thus giving the driver considerable advantage in turning and getting in and out of narrow streets.

Sanford trucks are well balanced throughout and have the appearance of being well balanced.

The fact that the materials used are of the finest grade obtainable accounts for the extreme comparative lightness of Sanford trucks. This light weight enables exceptional tire guarantees. Chain and sprockets are extra large and heavy. In fact the 1¼ inch pitch roller chain which we are using is the same size usually put on one and a half and two ton sizes.

Be sure to look us up at the shows for we have some open territory that offers fine opportunities to live dealers. If you cannot see us at the shows, get in touch with us.

THE SANFORD MOTOR TRUCK CO., Syracuse, N. Y.

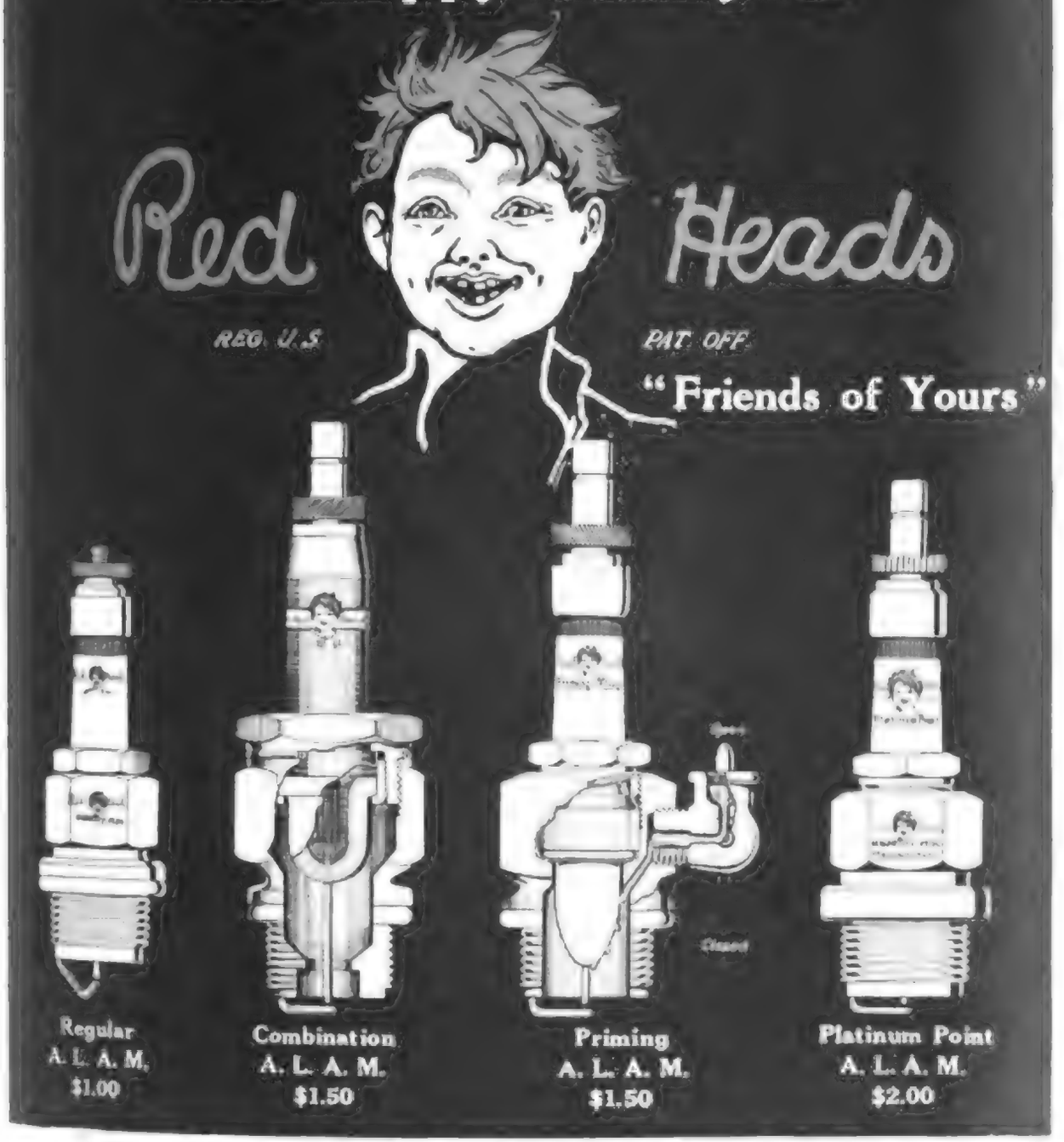
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The Happy Family of

Red Heads

REG. U.S. PAT. OFF.

"Friends of Yours"



The time is passing when one type of spark plug will serve for all types of motors. Combination electrical i
gnition and starting systems, high duty magnetos and the popularity of enclosed cars for winter use, have cre
ark plug problems. This line of specialized spark plugs is proof of our determination to adapt RED HE
ine conditions, instead of waiting for manufacturers to build their engines to suit the spark plugs

Regular Magneto Plug

...master of ...H P. Adopted as ... by the Reo, Hup... factories ... that laughs at the ... not be crack from ... of the motor. It has a deep ... and a ... side accu... ... cannot short circuit at ...

Combination Magneto Plug

Porcelain makes the best insulator, but it has drawbacks on account of its mechanical weakness — an accidental blow from a heavy wrench will fracture it. Mica cannot stand intense heat and cold without expansion and contraction —resulting in oil soaking in and short-circuiting. Therefore, the electrode is insulated with porcelain in the explosion chamber where mica would be disintegrated by oil and heat, and mica is used as the insulator outside of the explosion chamber where porcelain would be exposed to damage.

Priming Magneto Plug

This plug solves the problem of starting a cold engine instantly. Gasoline introduced through the cup of the Red Head Priming Plug, passes down the canal drilled in the shell, flows along the porcelain and drips directly to the sparking points, where it vaporizes and is ignited. Red Head Priming Plugs can be cleaned without removal from the cylinders. Open the petcocks while the engine is running and the compression shoots out the carbon.

Platinum Point Magneto P

We will replace free of charge Red Head Platinum Point Plu... fuses or corrodes from heat or ... years, but no longer. The Pl... Point (1/32nd of an inch) on the ... will stand more than 1,000 degrees ... heat—estimated four times hotter ... the hottest spark delivered by ... neto or combination ... starting system. All metal ... made on machines adjusted to ... ter accuracy. This insures ... threaded joints never before ... the manufacture of spark plugs.

Each of the above types of RED HEAD Plugs is the **DREADNOUGHT** of its class and has a record for ... the service for which it is intended.

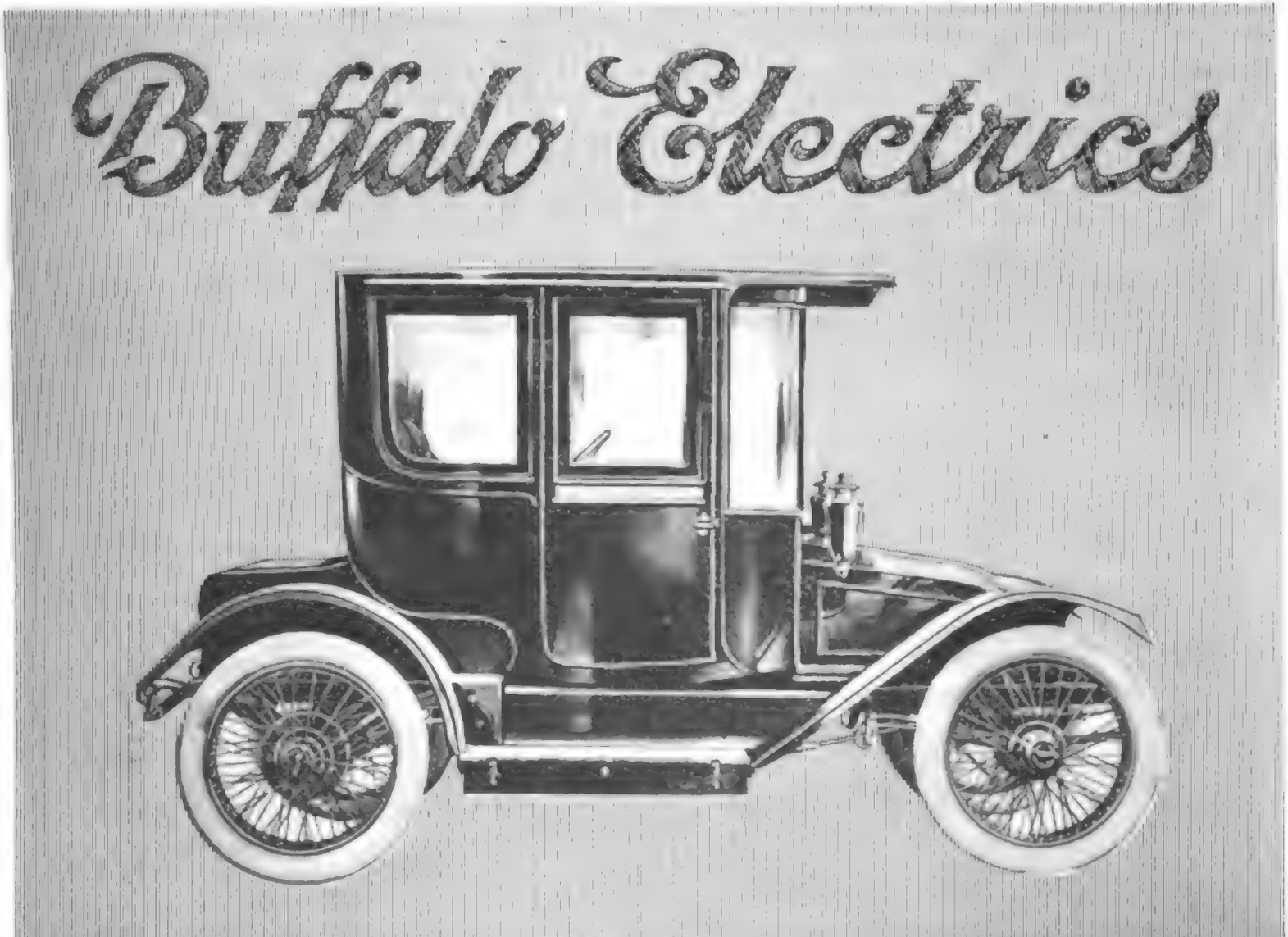
...tory, 644 Woodward Ave., Detroit, Mich.

Emil Grossman Company, Manufacturer

280 West 54th Street, New

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Buffalo Electrics



THREE models constitute the Buffalo Electric 1913 Line. One of the foremost automobile engineers designed the Buffalo Electric chassis and you will find in its make-up such elements as Single Reduction Direct Shaft Drive, Three Point Motor Suspension, Foot Control, as well as many other features which make Buffalo Electrics most efficient and economical in use. Buffalo Electrics develop remarkable speed and give extra long battery mileage. We have adopted wire wheels as optional equipment, because of their wonderful tire economy. Our own tests have proven them equally well adapted to the use of either cushion or pneumatic tires.

Buffalo Electric Pleasure Cars and Commercial Trucks offer a complete equipment for an electric motor sales business. If you are an established dealer, with the proper facilities for handling such business, it will pay you to investigate Buffalo Electrics—see them at the

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PLEASURE CARS

COUPES—Model 30 seats four passengers vis-a-vis. The body is roomy and luxurious with every appointment. 42 cell batteries serve a 20 H. P. motor, giving 25 miles an hour under ordinary conditions. 100-inch wheel base admits of turning in the street, with a single motion. Finish and upholstery are optional with the purchaser.

FORWARD DRIVE BROUGHAM—Model 30-B is the highest development of modern town cars. It readily accommodates five passengers, three on the rear seat and one forward in a companion seat to the driver's. The driver's seat is stationary, of the Pullman chair type, while the companion seat is set on a swivel, permitting the occupant to face forward or turn facing backward. Side lever or wheel steer is optional—on Buffalo Electrics.

RUNABOUT—Model 29 makes the Buffalo Electric line complete. There is a growing demand by business and professional men for an electric, speedy, comfortable and easy to drive. The runabout develops 35 miles an hour, and like all Buffalo Electrics has the Foot Control, Direct Shaft Drive and other features of value in the driving and maintenance of a town and suburban car.

COMMERCIAL CARS

BUFFALO ELECTRIC TRUCKS are built in three sizes from 1500 pounds to two tons. The lighter capacity truck is shaft driven direct from motor to rear axle with the reduction in the differential gears. They have ample battery capacity for a big day's work at a more rapid speed than the larger trucks.

Buffalo Electric trucks of 1½-ton and 2-ton capacity are chain driven.

THE DESIGN of Buffalo Electric Trucks is right. A close study of conditions and attention to problems already worked out by others gave our engineers a clear conception of the ideal truck to meet conditions in its specific field.

With the idea worked out, materials were selected and tested by competent experts, matters of battery equipment were balanced with load requirements and operating costs until each and every Buffalo Electric Truck offers the maximum of service value at a most economical rate per ton mile.

All trucks are sold with chassis and driver's seat complete. Special bodies are built to the order of purchasers.

Buffalo Electric Pleasure Cars and Trucks will be exhibited at prominent shows. The Buffalo Electric Vehicle Company is strong financially and is prepared to push the business aggressively. Dealers who are interested must possess the resources and business responsibility to conduct such an agency in a broad-gauge, up-to-date manner.

BUFFALO ELECTRIC VEHICLE CO.

Special Exhibit
New York Show

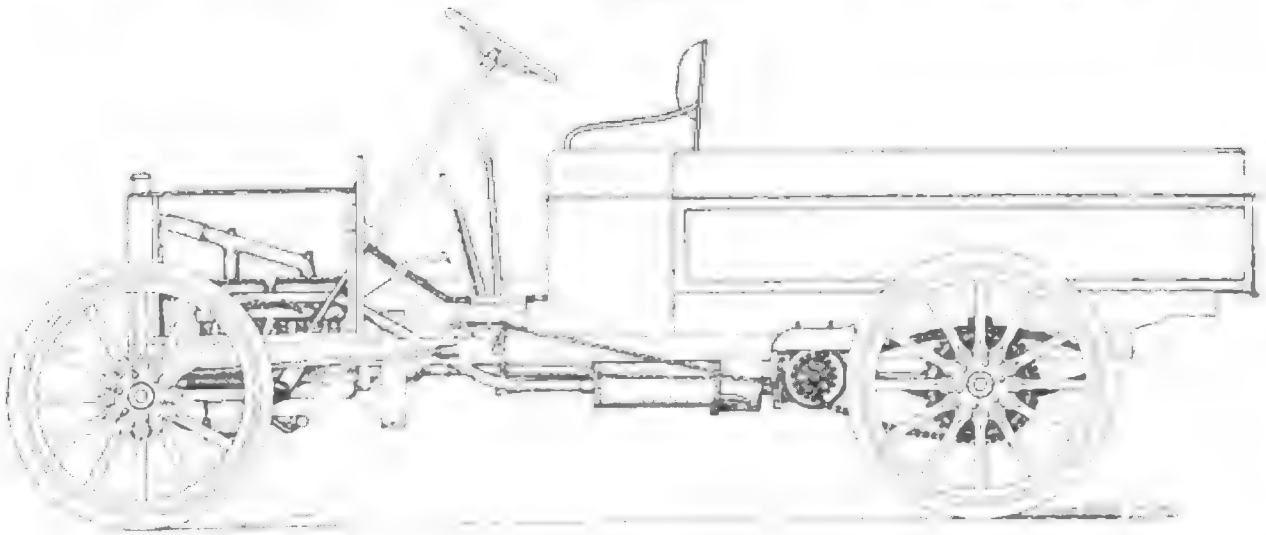
Factory and General Offices:
1219-23 Main Street BUFFALO, N. Y.

Special Exhibit
Chicago Show

BOSTON NEW YORK PHILADELPHIA ROCHESTER MONTREAL TORONTO SPOKANE

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The New MOTOR WAGON DETROIT



4 Cylinder, 4 Cycle Long Stroke Motor, 16-20 h.p.

CHAIN DRIVE—SOLID TIRES—EVERY PART STANDARD

The new Motor-Wagon represents a practical development. It embodies features of construction that are the result of daily service in over thirty-one different lines of business. It is neither freakish nor faddish. Standard truck practice is followed throughout.

Note these Details: Long Stroke Motor, Bosch Magneto with fixed spark, Muncie Transmission and Jackshaft, Whitney Chains, Dead Rear Axle (1 1-2 inch squared), 3-inch Channel Frame, Solid Tires front and rear. This car is designed from start to finish for use with solid tires and gives a reliable economical service that cannot be duplicated.

The Motor-Wagon meets the demand for a strong, serviceable, economical half-ton truck designed from a thorough knowledge of the services required.

Get in immediate touch with us. We have a proposition that makes a hit with every merchant. It has the capacity and the economy of operation buyers want. Write at once for full details.

THE MOTOR WAGON COMPANY OF DETROIT
DETROIT, MICHIGAN

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The rims illustrated and described on the following pages are made and sold only by

The
STANDARD WELDING
COMPANY Cleveland Sixth City

PIONEERS *and*
WORLD'S LARGEST PRODUCERS
of AUTOMOBILE RIMS

OFFICES IN
NEW YORK CHICAGO DETROIT

In their ability to perform various functions essential to a good and satisfactory rim, they surpass anything yet produced.

In workmanship and high quality of material they cannot be excelled



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Safe, certain, easy and quick to operate is the detaching mechanism on the No. 40 and No. 50 series of STANWELD rims.

A little lever with a cam — pry it loose with a screw driver, swing it outward and remove the side ring. Then slip off your tire. No lateral compression of tire is necessary to do this.

The side ring nor the lock can not of themselves come loose.

The side ring can be reversed to accept either straight side or clincher tires.

There are no loose parts to the detaching mechanism other than the removable ring.

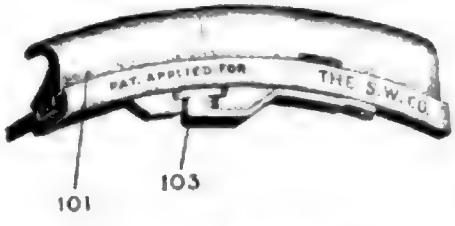
No special tools are necessary to operate STANWELD rims.

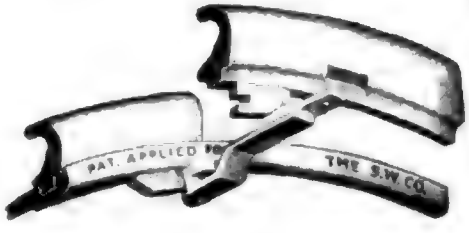
Endorsed by the leading automobile engineers, tire makers and car owners and adopted as standard equipment on many of America's most complete and luxurious cars, STANWELD rims are destined soon to become the universal wheel equipment.

The Standard Welding Co.

Cleveland, Ohio







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STANWELD demountable rims, series No. 40, stand alone in their pre-eminent efficiency.

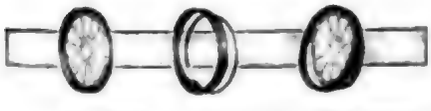
Universal in their acceptance of tires, automatic in their mechanical operation, combining both a quick detaching and demounting feature which operate independently, and positively preventing wobbling of tires, they surmount all the defects of former types of demountable rims.

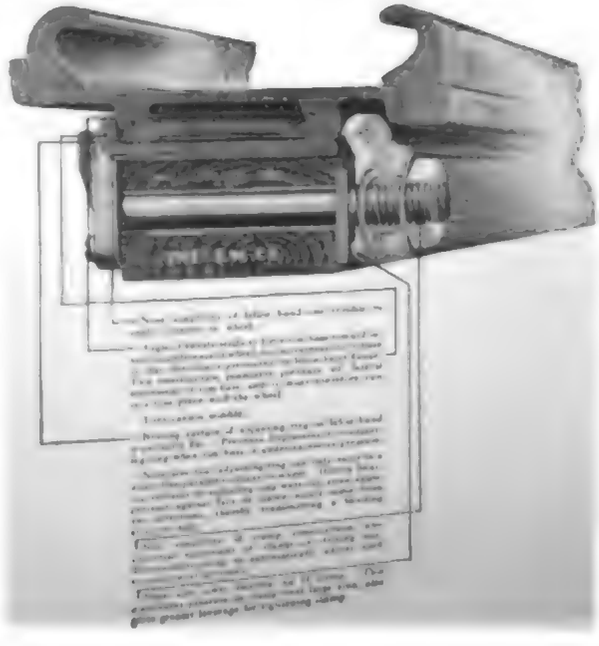
STANWELD rims, No. 40 series have an entirely new feature for the securing of the rim base to the wheel The adjusting ring. This device is an intermediary band that lies under the entire rim base and supports it at all points of the front and rear circumference.

The rim base has the felloe band flange as a guage for its lateral position and must always lie in the same perfect position on the wheel no matter how the clamping devices are tightened. This is the preventive of tire wobbling, one of the prime reasons for excessive tire expense.

Number 40 STANWELD rims are the wheel equipment on all leading makes of cars.

The Standard Welding Co.
Cleveland, Ohio





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STANWELD Rim No. 30 is designed for those who require a demountable rim of minimum weight and extreme simplicity.

It has both the quick detachable and demountable features and is made in two styles, one for straight side tires and one for clincher.

This rim is split circumferentially, the two sections having corresponding lugs that are locked together by two semi-circular rings. One end of each ring is securely rivited to the wider portion of the rim base. The free ends of these rings are secured by a swinging latch which is in turn locked by a cam latch.

No special tools are required to operate this rim and no circumferential movement of either section is necessary to disengage the two parts of the rim base.

The rim base of **STANWELD** Rim No. 30 will fit the felloe band of either the Continental Gilbert type rim or the Standard Universal No. 3 rim, without requiring any special wheel work or additional equipment.

The Standard Welding Co.

Cleveland, Ohio





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Yes they can be broken

BUT NO BLOW IN ACTUAL SERVICE CAN DO IT



SHELDON

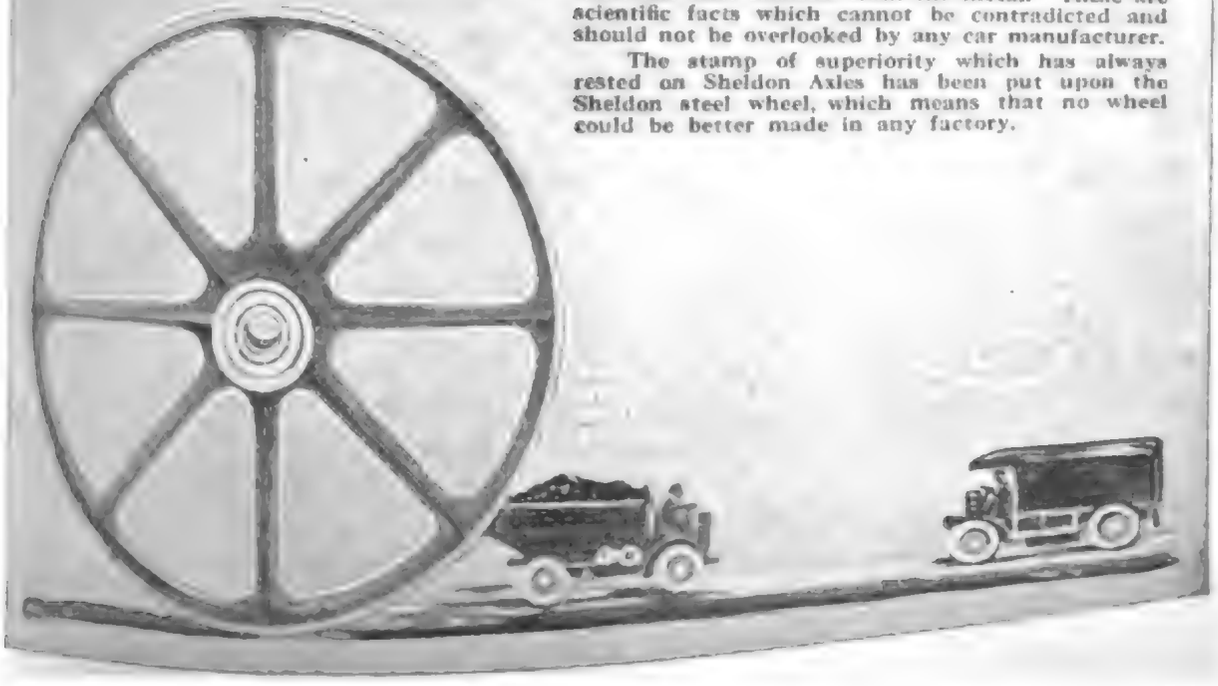
STEEL WHEEL

Here is a wheel that weighs less than the wooden wheel, that is positively unbreakable and that will outlast the best twenty cars that ever were manufactured.

The Sheldon steel wheel is the result of years of study of the wheel problem, the concentration of expert effort on improved design, and the most economic methods of construction known to the industry. It is unbreakable under conditions that would smash a wooden wheel to fragments and make a wire wheel unfit for anything but junk. The superior resiliency of the Sheldon steel wheel adds another advantage which the car owner or car manufacturer cannot overlook—tire economy.

This tire economy results from the light weight at the wheel's periphery and the rapidity with which frictional heat radiates from the metal. These are scientific facts which cannot be contradicted and should not be overlooked by any car manufacturer.

The stamp of superiority which has always rested on Sheldon Axles has been put upon the Sheldon steel wheel, which means that no wheel could be better made in any factory.



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AUTOMOBILE DEALERS

Can Handle Woodworth Treads More Profitably and With Less Risk Than Any Other Auto Accessory

Easy Sales *Repeat Orders*
Guaranteed Service *Small Expense*



"Double Grip" Woodworth Tread, for use on snow and ice. The high rivets are cupped and hardened, and can be renewed.

The Market

Every live dealer has many customers who will gladly pay a good price for freedom from punctures and skidding. To doctors and business men especially, such immunity is invaluable. At present most of them accept the puncture risk, and reluctantly use chains to avoid skidding. When they realize that in Woodworth Treads they can have not only protection against skidding but puncture insurance added without extra cost, they will gladly buy the Treads and use them constantly.

Guarantees

Woodworth Treads do their work so well that we are prepared to guarantee them to the fullest extent. We make good any Treads which do not give the full guaranteed mileage; we support the dealer in selling the Treads on trial, because almost invariably a trial means a sale and a permanent customer; we guarantee the Treads not to damage the tires; and we allow the dealer to return for full credit any goods ordered but not sold.

Dealer Helps

To assist dealers in displaying the goods, we furnish free of charge on request a lithographed metal reproduction, showing the Tread **full size.** Attached to this is a pad of circulars with description and prices. We will also send a small section showing the materials and construction. Thus the dealer can show the goods and take orders with no investment save for the express charges on this outfit. We have also made arrangements by which dealers in all parts of the country can get the goods promptly and with small expense for express charges.

Write us stating you will pay the express charges on our order-taking outfit and we will send it to you free, will enter you as our agent for your territory, and will explain how you can get the goods promptly and without high express charges.

See Us at the New York Show

In spring and summer use the regular style WOODWORTH TREADS. They prevent skidding, abolish punctures and pay more than their cost in the tire life they add.

LEATHER TIRE GOODS COMPANY, Niagara Falls, N. Y.

New York Store, 1608 Broadway

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CUBIT



ELECTRIC HORN

$3.00

A Good Horn at a Low Price.
In Black Enamel, very High Gloss.
Weighs Two Pounds and a Half.
Consumes very little current ($1\frac{1}{2}$ to $2\frac{1}{2}$ amps.).
Emits high toned Musical Blast.
Has no working parts to get out of order.
Has no VIBRATOR, the diaphragm is the Armature.
Requires no Oil. Runs on SIX VOLTS.
Gets better with age as the "Bulging" of the diaphragm which is detrimental to other horns makes the "CUBIT" more efficient.

TO AGENTS
Write to immediately for Exclusive Territory.

Push button and wire that retails for $2.00 packed in separate box, 35 cents extra.

J. R. MACK, Gen. Sales Manager

KOSMAK ELECTRICAL COMPANY

JERSEY CITY, N. J.

Office and Factory, 299 Ocean Ave. Factory, 17 Stevens Ave.
Branch Office, Ford Building, Detroit.

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The Way They Look on European Cars

Rudge Whitworth

DETACHABLE WIRE WHEELS

fitted with

QUICK DETACHABLE HOUK RIMS

WHEN you look at the beauty of the Rudge-Whitworth Detachable Wire Wheel, you wonder how the unsightly artillery wheel has so long held the market. And, when you consider the greater strength, the almost indestructibility of *our famous wire wheels,* your wonder grows.

This combination of strength and beauty is now being offered to the American Motoring Industry by the Standard Roller Bearing Company, of Philadelphia. This Company is making Rudge-Whitworth wheels under Rudge-Whitworth patents, and they are equipped with the Houk Rim—*the only real quick detachable rim on the market.*

Absolutely rustless

GEORGE W. HOUK COMPANY

6003 Lancaster Avenue **Philadelphia, Pa.**

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The Growth & the Sale of Spit-Fire Spark Plugs Has Been One of the Marvels of the Automobile Industry

Present Output Between 19 and 20,000,000

COMPARATIVE SALE 1898

EVERY GOOD DEALER Handles Mosler Spit Fire Plugs



Cure Ignition Trouble

We Guarantee All

MOSLER SPIT-FIRE PLUGS

For Workmanship and Material

Our Mechanical Engineer will be at our BOOTH No. 156 at first elevated platform

AT MADISON SQUARE GARDEN

During Automobile Show--January 11th-25th

If you are having ignition trouble of ANY kind—with ANY plug—we will gladly give you our assistance and advice

For 15 years we have been THE ACKNOWLEDGED LEADERS IN SPARK PLUG IGNITION

A. R. Mosler & Co. P. O. Box M Mt. Vernon, N. Y.

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The Typhoon Electric Horns



ranging in price from $6.00 to $20.00 are models of tone value, durability, and beauty of lines and finish.

Guaranteed One Year

Several of the most popular sellers are shown on this page as part of the most complete assortment to choose from — both vibrating and motor driven types; notably concealed type E, with megaphone projector as noted in the top illustration. This horn gives a mellow but commanding warning and does not break the lines of up-to-date construction of the automobile.

Typhoon Electric Horns will satisfy the most critical judges of signals. They are already used by fourteen of the best automobile manufacturers in the country as standard equipment.

Write for our illustrated literature and commercial proposition to the trade. Both are worth having.

The TYPHOON SIGNAL CO.
1304 Michigan Avenue Chicago, Illinois

THE LARGEST AUTO SUPPLY HOUSE IN AMERICA

Our Name Is Your Guarantee

WHATEVER you buy from the house of CHAS. E. MILLER you may expect the fullest degree of satisfaction in every detail. Quality, quantity, material, workmanship, durability will be just right or we will make it right. Our name is your guarantee.

To buy from a house the size and standing of this one is the safest way to insure complete satisfaction in all your dealings. We handle goods of **standard quality only** and of course stand back of everything we sell.

No matter what you want in the line of automobile accessories or supplies, remember our slogan, "We Either CARRY IT IN STOCK, WILL GET IT—OR IT ISN'T MADE." One of the prize winners in MOTOR'S recent advertising contest selected this as the slogan out of the many shown. His reason was as follows: "This saying is the clearest possible statement of the Miller business policy which I have found to be a fact through several years of satisfactory relations with them."

Our Annual Catalog is the largest, most complete, up-to-date and authoritative dictionary of the auto supply market of any book published. It has come to be recognized as one of the standard reference works of the industry.

The total distribution of one hundred thousand copies of this catalog practically covers the world, at least wherever automobiles are used. Nearly all foreign as well as domestic automobile manufacturers and dealers, the offices of American Consuls, Public Libraries, Universities, Y. M. C. A. Schools, Publishers, Automobile Clubs, Engineers' Offices, Purchasing Departments—in all these places you will find a copy of the Miller catalog on file.

Fifteen branches spread over the United States, located in the principal motoring centers, bring Miller service within the reach of practically every motorist in the United States. Prompt delivery, perfect quality, honest prices—these are the things that distinguish Miller service and explain the marvelous growth of this pioneer establishment since its inception in 1896.

CATALOG MAILED TO ANY ONE ANY PLACE ON REQUEST

Chas. E. Miller Manufacturer, Jobber, Exporter and Importer

ESTABLISHED 1896

Home Office: 97-99-101-103 Reade Street, New York City

ORDER FROM NEAREST BRANCH, ADDRESS CHAS. E. MILLER

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DETROIT, MICH. 227-229 Jefferson Ave.
CLEVELAND, O. 1829 Euclid Avenue
PHILADELPHIA, PA. 318 North Broad St.
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NEWARK, N. J. 274 Halsey Street

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1855
QUALITY WHEELS
for
QUALITY CARS
Since Spokes and Rims Began to Develop into correct Wheel Design We Have Anticipated Progress
There is Sixty-Eight Years of Experience Back of This
PHINEAS JONES & COMPANY
305 Market Street
Newark, N. J.
Branch Factory:
12th Ave. & 55th St., N.Y.
1913

The FACTORIES Back of GRAY & DAVIS



Quality Equipment for Automobiles

A great manufacturing and service organization stands back of the GRAY & DAVIS products, insuring expert workmanship, quality in material and prompt deliveries.

GRAY & DAVIS, Inc., 55 Lansdowne Street, Boston, Mass.


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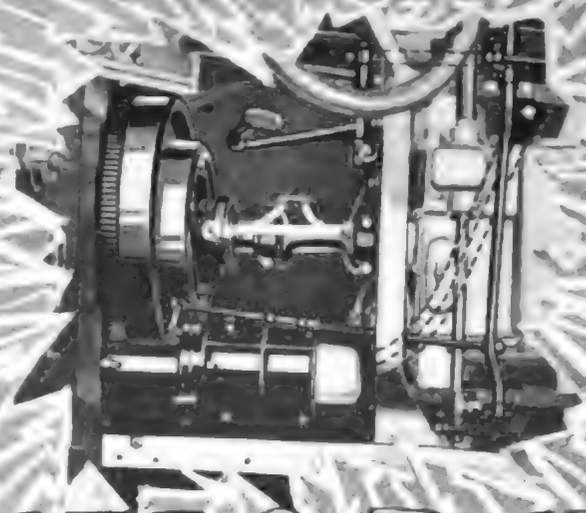
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GRAY & DAVIS, Inc., 55 Lansdowne Street, Boston, Mass.



GRAY & DAVIS

Electric Starter

The Most Powerful of All Starters

The GRAY & DAVIS 6-volt Electric Starter stands pre-eminent among starting devices. No other starter can compare with it for efficiency, power and positive operation. The great big feature is the small 6-volt battery that is part of the system—exactly the same style of battery as you've **always** used for ignition.

The GRAY & DAVIS Electric Starter is a marvel of simplicity. There are no complicated controls—only a simple switch. It starts a car under any conditions even in **zero** weather.

It is a specially designed motor which rotates the fly-wheel—will spin a 6-cylinder car for one and one-half hours—propel it 2 miles. Two minutes after car is started, under gasoline power, the current used for starting is replaced in the battery.

A big factor of safety. If the car is stalled on car tracks or in traffic, you press pedal and the car is propelled by the starter. You don't have to change gears or touch throttles. It is not sold direct to the owner—demand it on the car you purchase.

America's leading manufacturers have adopted the GRAY & DAVIS 6-volt Electric Starter as 1913 equipment—this endorsement by those who know most about starters, substantiates our claim that it is the most efficient starter obtainable.



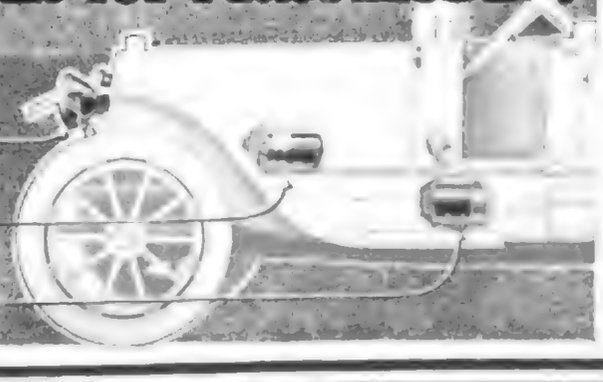
GRAY & DAVIS

Electric Lighting Dynamo

Lights the Automobile World

GRAY & DAVIS Lighting Dynamo System has been in service 5 years. It made possible the great electric movement of today, because it was the **first** practical system. It has the CONSTANT SPEED feature, the voltage will not vary and lights the lamps irrespective of the condition of the battery—this Dynamo is unquestionably better than any other lighting system.

Quality Equipment for Automobiles



Electric Lamps
Lighting Dynamo
Electric Starter



GRAY & DAVIS Electric Lamps





Every Improvement in Lamp Design and Construction Has Emanated from The Gray & Davis Factories

Gray & Davis Are the Pioneer Lamp Builders of America. 17 Years Experience in Lamp Construction

Quality—Efficiency—Style

GRAY & DAVIS Electric Lamps are recognized as the QUALITY lamps of the automobile industry. They are solidly constructed, made of the finest material and possess the beauty in line and finish which we associate with the high-class car. The good cars carry GRAY & DAVIS Lamps. They greatly add to style and appearance, produce the most powerful and penetrating illumination obtainable.



Merry Christmas

Charles Dickens
Robert Louis Stevenson

Clement C. Moore
James Whitcomb Riley
F. Hopkinson Smith

Henry Van Dyke
Eugene Field

"My friends, my very dear friends, I should say, for I omit none of you—befo' I kindle with the torch of my love these little beacons which are to light each one of us on our way until another Christmas season overtakes us; befo', I say, these sparks burst into life, I want you to fill yo' glasses—"—*Col. Carter's Christmas Tree.—F. Hopkinson Smith.*

"I don't know what to do!" cried Scrooge, laughing and crying in the same breath and making a perfect Laocoön of himself with his stockings. "I am as light as a feather. I am as happy as an angel. I am as merry as a schoolboy. I am as giddy as a drunken man. A merry Christmas to everybody! A happy New Year to all the world. Hallo, here! Whoop! Hallo!"

"He had frisked into the sitting room and was now standing there, perfectly winded.

"I don't know what day of the month it is!" said Scrooge. "I don't know how long I've been among the spirits. I don't know anything. I'm quite a baby. Never mind. I don't care. I'd rather be a baby. Hallo! Whoop! Hallo here!"

"He was checked in his transports by the churches ringing out the lustiest peals he had ever heard. Clash, clang, hammer, ding, dong, bell. Oh, glorious, glorious! Running to the window he opened it and put out his head. No fog, no mist; clear, bright, jovial, stirring, cold; cold, piping for the blood to dance to; golden sunlight; heavenly sky; sweet, fresh air, merry bells. Oh, glorious. Glorious!

"'What's to-day?' cried Scrooge, calling downward to a boy in Sunday clothes.

"'To-day?' replied the boy. 'Why, Christmas Day.'

"'It's Christmas Day!' said Scrooge to himself. 'I haven't missed it. The spirits have done it all in one night. They can do anything they like. Of course they can.'"—*Dickens.*

"To be honest, to be kind; to earn a little and spend a little less, to make upon the whole a family happier for his presence; to renounce when that shall be necessary and not be embittered, to keep a few friends, but these without capitulation; above all, on the same grim condition, to keep friends with himself—here is a task for all that a man has of fortitude and delicacy. He has an ambitious soul who would ask more; he has a hopeful spirit who should look in such an enterprise to be successful."—*Robert Louis Stevenson. A Christmas Sermon.*

Probably more grown men and women can repeat to-day: "'Twas the Night Before Christmas" than can remember any other poem of equal length in the language. They may have forgotten the name of the author, Clement C. Moore, but they can reel off the beginning glibly enough.

'Twas the night before Christmas and all through the house
Not a creature was stirring, not even a mouse;
The stockings were hung by the chimney with care
In hopes that St. Nicholas soon would be there;
The children were nestled all snug in their beds,
While visions of sugar plums danced in their heads.

And how these elocutionary lights, as well as the rest of us who are not vocally inclined, have revelled in Eugene Field's delicious "Jes' 'Fore Christmas."

"Father calls me William, sister calls me Will,
Mother calls me Willie—the fellers call me Bill!
* * * * * * *
Most all the time the hull year round there ain't no flies on me,
But jes' 'fore Christmas I'm as good as I kin be!

And the pious smugness with which this interesting imp coordinates in unctuous joy to the soul of the reader:

But Christmas, with its lots and lots uv candies, cakes and toys,
Wun made, they say, fur proper kids and not fur naughty boys!
So wush yer face an' brush yer hair an' mind your p's and q's,
An' don't bust out yer pantaloons an' don't wear out yer shoes.
Say "yessum" to the ladies an' "yessir" to the men,
An' when they's company don't pass yer plate fur pie again;
But, thinkin' uv the things you'd like to see upon that tree,
Jes' 'fore Christmas be as good as you kin be!"

"They's a kind o' feel in the air to me
When the Christmas time sets in
That's about as much of a mystery
As ever I've run ag'in.

Is it the bleat o' the whistle and beat
O' the little toy drums and blare
A' the horn? No! No! It is jest the sweet—
The sad-sweet feel in the air!"
James Whitcomb Riley.

"Hang up the baby's stockings;
Be sure you don't forget;
The dear little dimpled darling,
She ne'er saw Christmas yet."

Henry Van Dyke preaches another pretty good sermon in "The Spirit of Christmas," which was published seven years ago. He says there is something better than keeping Christmas Day, "and that is keeping Christmas. Are you willing to forget what you have done for other people and to remember what other people have done for you; to ignore what the world owes you, and to think what you owe the world, to put your rights in the background, your duties in the middle distance and your chance to do a little more than your duty in the foreground; to see that your fellowmen are just as real as you are, and try to look behind their faces to their hearts, hungry for joy; to own that probably the only good reason for your existence is not what you are going to get out of life, but what you are going to give to life to close your book of complaints against the management of the universe, and look around you for a place where you can sow a few seeds of happiness—are you willing to do these things even for a day? Then you can keep Christmas.

"Are you willing to stoop down and consider the needs and desires of little children; to remember the weakness and loneliness of people who are growing old; to stop asking who much your friends love you, and ask yourself whether you love them enough; to bear in mind the things that other people have to bear in their hearts; to try to understand what those who live in the same house with you really want, without waiting for them to tell you; to trim your lamp so that it will give more light and less smoke, and to carry it in front so that your shadow will fall behind you; to make a grave for your ugly thoughts and a garden for your kindly feelings, with the gate open—are you willing to do these things even for a day? Then you can keep Christmas.

"Are you willing to believe that love is the strongest thing in the world—stronger than hate, stronger than evil, stronger than death—and that the blessed life which began in Bethlehem nineteen hundred years ago is the image and brightness of the Eternal love? Then you can keep Christmas. And if you can keep it for a day, why not always?"

"And so, as Tiny Tim observed, God Bless Us, Every One!"

Says Longfellow:

"I heard the bells on Christmas Day
Their old familiar carols play,
And wild and sweet
The words repeat
Of peace on earth, good will to men!"

BRETZ COMPANY
SOLE IMPORTERS
B & S Ball Bearings
250 West Fifty-fourth, New York

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Prest-O-Starter

Starts your engine (old or new) quickly and easily in coldest weather

For Four Cylinders $20

For Six Cylinders $25

$1.50 extra for two-way valve necessary when the same Prest-O-Lite is used for both starting and lighting.

Here's a starter that adds practically no weight to your car, is perfectly simple and is as durable as the engine itself. Easily applied to any engine, old or new, very economical in the use of gas, and requires no expert repairing.

How Prest-O-Starter Works

The principle of starting a motor with Prest-O-Starter is the same as "starting on compression." A measure of acetylene, at low pressure, is pumped from your Prest-O-Lite into the cylinders

Touch your spark—your engine starts

Unlike "gasoline priming," it is not affected by heat or cold. It is certain.

In cool weather, by opening a valve on the dash, you can feed gas at low pressure into the intake manifold. This allows your engine to run on acetylene until it is warm enough to run on gasoline.

If the Prest-O-Starter did no more than prime your engine in this way during cold weather, this convenience would be well worth the price.

But Prest-O-Starter is more than a primer. When installed properly, it will start your engine, summer or winter, almost invariably without recourse to the crank.

Make Sure Your Starter Is Installed CORRECTLY—Look It Over

The Prest-O-Starter is easy to install correctly. In fact, it's so very easy to install that some good factories and garages install it with utter carelessness, overlooking the one or two simple features vital to success in operation. Fortunately this is an easy matter for the car owner to correct, even if he isn't a mechanic.

Our literature tells you exactly how the Prest-O-Starter is installed, and how to adjust it. Anyone can give it the slight attention it may need or quickly tell a dealer where the trouble lies.

Every Prest-O-Starter is sold with the assurance of satisfactory service. The entire Prest-O-Lite Organization is back of every one. If you have any trouble, report it to us or to our nearest branch. We'll wipe it out quickly.

Insist Upon GETTING the Outfit COMPLETE

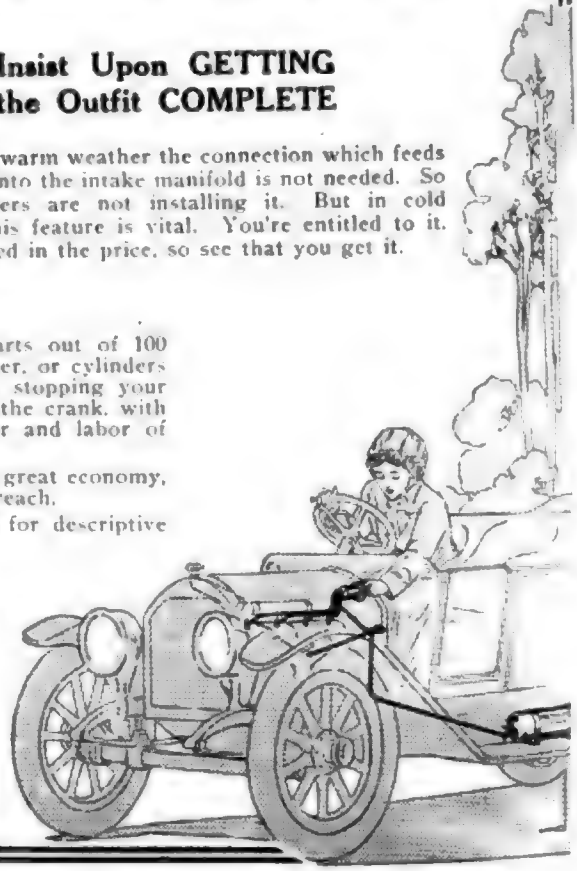
During warm weather the connection which feeds acetylene into the intake manifold is not needed. So some dealers are not installing it. But in cold weather this feature is vital. You're entitled to it. It's included in the price, so see that you get it.

Now—More Than Ever—You Need One

Your Prest-O-Starter, properly installed will average better than 95 starts out of 100 attempts. The few failures are caused by your motor stopping on dead center, or cylinders filled with burnt gas. Both of these conditions can be easily avoided when stopping your motor. But should either or both happen, an eighth or a quarter turn of the crank, with the switch at neutral, will remedy the trouble at once, with all the danger and labor of cranking eliminated.

Rest assured that no other starter can give you as high efficiency with as great economy, durability and freedom from mechanical trouble. The price is within easy reach.

Get in touch with any of our branches—or your dealer—or write us for descriptive literature.



The Prest-O-Lite Co., 287 E. South St. Indianapolis, Ind.

Canadian General Office and Factory, Merritton, Ont.

BRANCHES:

Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Memphis, Tenn.; Milwaukee, Minneapolis, New Orleans, New York, Omaha, Philadelphia, Pittsburgh, Portland, Ore.; Providence, St. Louis, St. Paul, Minn.; San Antonio, San Francisco, Seattle, Syracuse, Merritton, Ont.; Winnipeg, Manitoba.

Exchange Agencies Everywhere

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This book will show you why the Franklin dealership is a profitable one. Send in your application at once.

The dealer who handles the Franklin has a car with six exclusive features, each one of which is a sales clinching fact.

ENTZ ELECTRIC STARTING AND LIGHTING

A real self starter with really original features. Unfailing in action. You throw on the switch and the motor starts—no buttons, levers or pedals. In crowded traffic, if you slow the engine down to where it would ordinarily stall, the starter picks it up and starts it running again without any action on the part of the driver. A permanently connected starter without change gears.

THESE ARGUMENTS SELL FRANKLIN CARS

These are the arguments you can bring to bear upon the prospect when you show him the Franklin: (1) Uses less gasoline; (2) Uses less oil; (3) Wears out fewer tires; (4) Travels faster in the long run; (5) Rides easier; (6) Lasts longer.

Franklin dealers are making money and Franklin sales are increasing steadily every year. The Franklin now stands third in sales among all high-grade cars, and rapidly gaining on second place. The "Franklin Dealer Proposition" shows why this is so.

A PERMANENT BUSINESS CONSTANTLY INCREASING

One of our dealers says: "I could not very well drop the Franklin if I wanted to. Everywhere I have sold them I have created a permanent business. Franklin owners came back year after year."

The Franklin dealer does an all-year-around business. This means a profitable garage business. Franklin cars keep going summer and winter. They keep going because Franklin direct air cooling is not affected by weather conditions. They keep going because the owners can afford to drive them. They do not cost heavily to operate. If you sell Franklin cars in your territory you have a steady year-around demand for gasoline, oil, tires and accessories.

CONTINUOUS PRODUCTION INCREASES BUSINESS

Our continuous production policy makes the Franklin dealership a good proposition for the dealer. You can always offer the very latest model with the newest equipment. There are no "off months" waiting for the so-called yearly announcements. Franklin dealers do a good business every month in the year.

SEND FOR FRANKLIN DEALER PROPOSITION

Chicago has increased sales over last year, 195%; Philadelphia has increased sales 357%; San Francisco has increased sales over last year 200%; New York has increased sales 72%; Boston has increased sales 104%; Cincinnati has increased sales 500%. There is a big increase all along the line.

The Franklin Dealer Proposition will explain how you can get your share of this big increase.

FRANKLIN AUTOMOBILE COMPANY
28 Franklin Square Syracuse, New York

DEALER APPLICATION

FRANKLIN AUTOMOBILE COMPANY
28 Franklin Square Syracuse, New York

Please send "Dealer Proposition" as advertised Motor World, Dec. 26, 1912

Name .....

Address .....

Available Capital .....

Shop Facilities .....

Three references .....

.....

.....

Cars handled now .....

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Now Europe, Too

The Michigan "40" Wins World-Wide Acceptance as Leader of Its Class

Hundreds of dealers have come to this factory to see the new model of the Michigan "40."

In the first 30 days they left with us orders for 6,125 cars.

These men believe that this car is bound to lead the Forties this year.

Then Europe Came

Then came experts from Europe—artists in cars. Men who must compete with the finest cars in the world.

They came from England, Scotland, France, Russia, Germany and China. And these men agreed that no medium-priced "40," either in Europe or here, had so many attractions.

Some of the world's leading dealers, including the German Packard Motor Car Co., took our agencies abroad.

These Men Know

These experts and dealers, some of whose orders approach $1,000,000, don't make mistakes on cars.

Their tests were searching and extreme. Some of these men spent weeks in our factory.

They know the whole market. When they unite in this way on the Michigan "40" their judgment can well be regarded as final.

What Won Them

These men were brought here by the fact that W. H. Cameron is this car's designer. There are 100,000 successful cars which tell what he can do.

This new model results from four years of development. And 5,000 cars have been built in those four years to prove out 300 improvements.

The body is a John A. Campbell creation. It has 14-inch Turkish cushions and 22 coats.

The car has four-forward-speed transmission. It is vastly over-tired. It has center control, left-side drive, electric lights with dynamo.

It represents the last word in comfort, luxury and strength.

There is not another car with so many attractions sold at anywhere near this price.

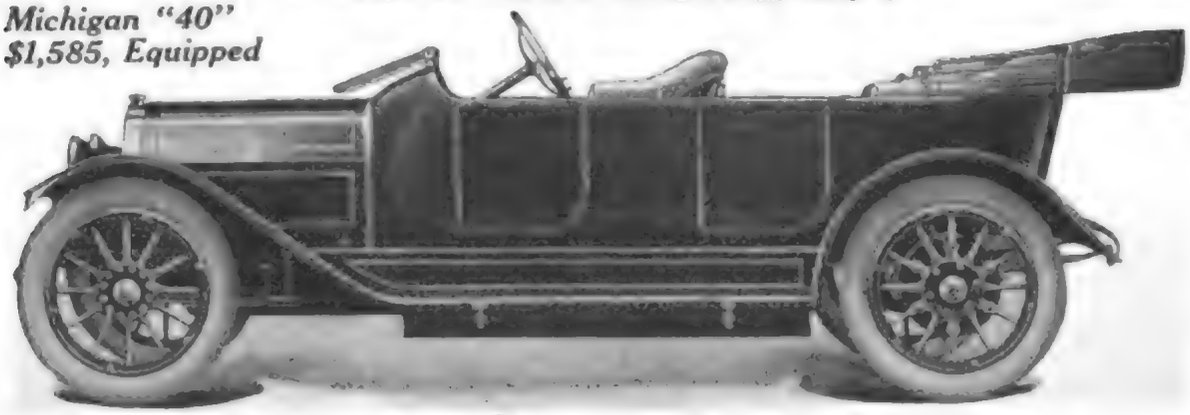
The Michigan "40" is one of the most-talked-of cars in America. You never saw more effective advertising. And our advertising expenditure for the 1913 season is $350,000.

We can take care of a few more dealers in territories not yet closed. Write for our proposition.

MICHIGAN MOTOR CAR CO., Kalamazoo, Michigan

Owned by the Owners of the Michigan Buggy Company

Michigan "40"
$1,585, Equipped



SOME OF THE MICHIGAN FEATURES

Four-forward-speed transmission
Oversize tires—35 x 4½
Electric lights and dynamo
Center control—left-side drive
Motor, 4¼ x 5½
Extra effective brakes—16 x 2¼ ins.
Big, comfortable springs
Adjustable steering post
Adjustable pedals
Firestone Q. D. demountable rims—extra rim

14-inch Turkish cushions
Rear cushion 50 inches long
Hand-buffed leather upholstering
Best curled-hair filling
Wheel base 118 inches
Nickel mountings
Large over-capacity, giving big factors of safety
Pressed steel, full floating rear axle
Axles sufficient for an 80-horse-power car.

Genuine cellular-type radiator
Best mohair top, side curtains and envelope
Windshield built in as part of body
Electric horn
$50 speedometer, 4-inch dial
Special foot rail
Swing robe rail
Rear tire irons
Complete tool equipment
Tool chests under running boards

There is such a difference of opinion about the various types of self-starters that we have not adopted any one type as regular equipment. We prefer to leave this selection to the buyer. We equip with either the gas or a positively efficient electric starter at moderate extra price.

(136)

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The Press Work of this big issue of Motor World was done entirely by the

Mail and Express Job Print

9 and 11 MURRAY STREET, NEW YORK · TELEPHONE 5940 BARCLAY

The facilities of this plant are equal to any requirements and the finest grade of

Automobile Catalogs

can be produced under the direction of men trained in the creation of effective and artistic printing

Nothing Too Large **Nothing Too Small**

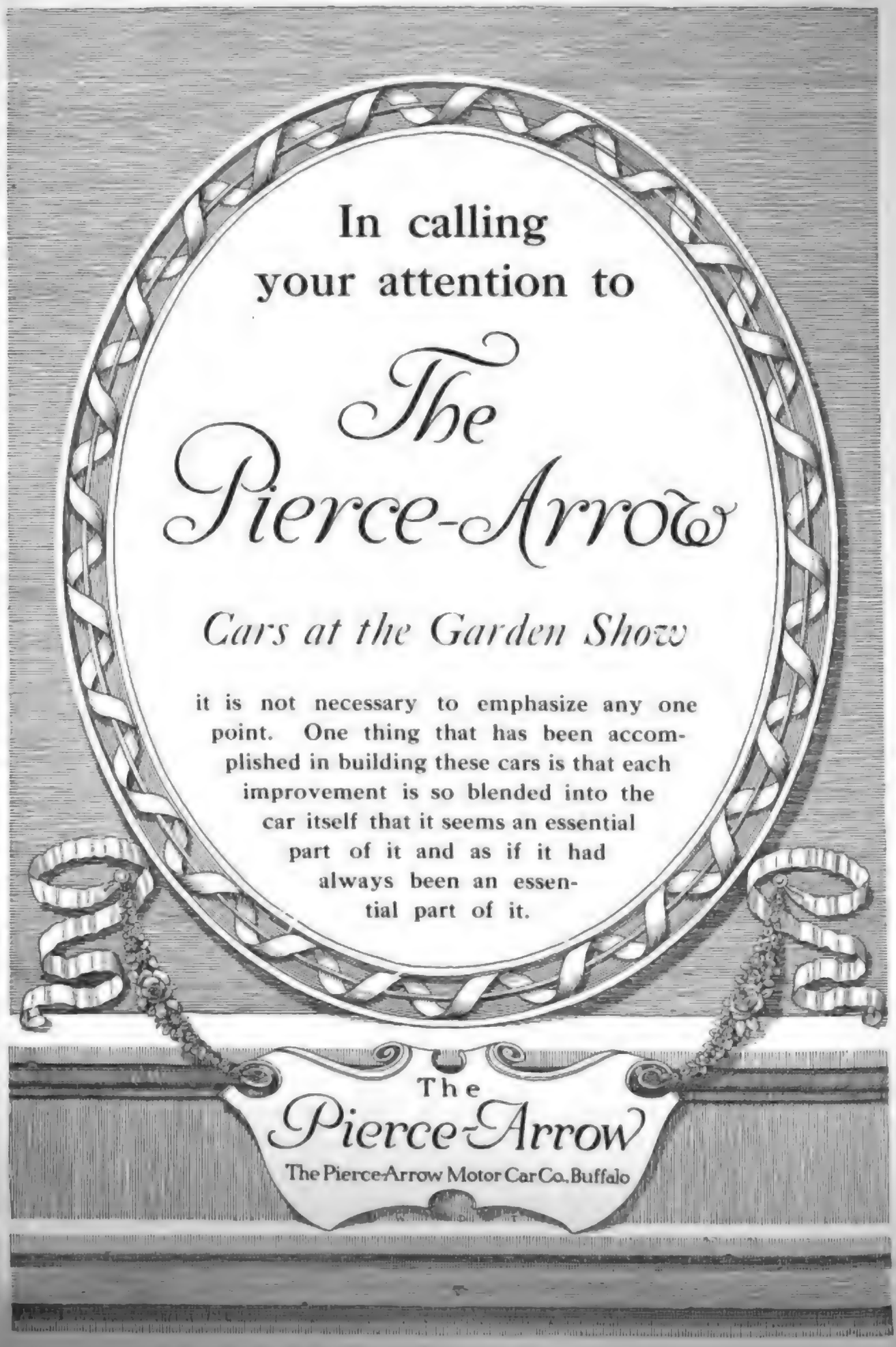
Day and Night Operation

Lithography :: Stationery :: Engraving

Prompt Personal Attention Given to Inquiries by Mail or Telephone

TELEPHONE, BARCLAY 5940

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In calling
your attention to
The
Pierce-Arrow
Cars at the Garden Show
it is not necessary to emphasize any one point. One thing that has been accomplished in building these cars is that each improvement is so blended into the car itself that it seems an essential part of it and as if it had always been an essential part of it.
The
Pierce-Arrow
The Pierce-Arrow Motor Car Co., Buffalo

The truck with the worm gear drive at the Garden Show

The Pierce-Arrow Motor Truck is the only American built heavy service truck using the worm gear drive. This drive is the most direct and efficient means of transmitting the power of the motor to the rear wheels. Its economic value shows in operating cost figures.

The worm gear drive of the Pierce-Arrow Truck saves both power and wear. Its efficiency has been proved by three years of constant service in Pierce-Arrow Trucks —and it is backed by this guarantee:

The worm wheel and worm shaft, generally known as worm gear construction, employed in the Pierce-Arrow Truck, are warranted to fulfill their functions for one year from date of shipment, under normal service.

PIERCE-ARROW
5-TON MOTOR TRUCKS

THE PIERCE-ARROW MOTOR CAR COMPANY, BUFFALO, NEW YORK

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The

Pilot

"The Car Ahead"

Fourth Successful Year—Three Great Models

Pilot 40, four cylinders, famous Teetor motor, 4½" bore, 5" stroke, 53 H. P., 120" wheel base, large New Departure bearings in wheels, double internal expanding brakes, 14" diameter, 36 x 4 tires. Our great four cylinder car with three years of constant, unfailing service to its owners. Roadster or Touring car. PRICE ONLY $2000.

Pilot 50, four cylinders, Teetor motor, 4½" bore, 6" stroke, 59 H. P., 126" wheel base, five or seven passenger Touring car, 11" cushion in tonneau, large New Departure bearings in front hubs, with Hoffman balls, Hess-Bright bearings with D. W. & F. balls in rear hubs, double internal expanding brakes, 16" diameter, 37 x 4½ tires. PRICE ONLY $2250.

Pilot 60, six cylinders, the wonderful new Teetor motor, 4" bore, 6" stroke, 67 H. P., 132" wheel base, five or seven passenger Touring car, 11" cushion in tonneau, large New Departure bearings in front hubs, with Hoffman balls, Hess-Bright bearings, with D. W. & F. balls in rear hubs, double internal expanding brakes, 16" diameter, gasoline pressure feed, 37 x 4½ tires. PRICE ONLY $2500.

Electric Lighting—Electric Starter

The famous GRAY & DAVIS system of lighting and starting. A more expensive system for lighting and starting to buy than others, but more reliable and efficient than any other. POWER TIRE PUMP operating from fly wheel to inflate tires.

Press a Lever to Start Your Motor, to Light Your Lamps and Fill Your Tires With Air

Beautiful upholstered jewel bodies, cushions 11 inches deep and a handsome ventilating windshield of special design are exclusive features.

Every Convenience and Comfort—Every Part of Machinery Accessible Without Soiling a Coat Sleeve

The most beautiful and powerful cars constructed this year. TEETOR "T" HEAD MOTORS in all models, the simplest and most powerful motors built in this country. Not a grease cup on them. MOST PERFECT OILING SYSTEM ever devised—it cannot go wrong. COOLING SYSTEM so efficient that a Pilot has been operated 4,000 miles in the New England hills the past summer WITHOUT a fan.

NICKEL BABBITT BEARINGS in motors (not bronze), the best material for bearings ever found. Motor has 170 LESS PARTS, WEIGHS 150 LBS. LESS and delivers to rear axle straight line drive) far more horsepower than any other motors of similar piston displacement.

SPEED AND ECONOMY RECORDS EVERYWHERE. MOTOR NOTED FOR ITS HILL CLIMBING ABILITY.

Won the Algonquin Hill Climb in Chicago three successive years and cut 25 seconds from the previous record for its class at Dead Horse Hill at Worcester, Mass., in 1910.

The Strongest Built Car in America

With a record for unfailing service in the mountains and deserts which have been the graveyard of so many automobiles and where many manufacturers do not care to send their cars. LET US SEND THE PROOF. If you could visit our factory and see the way we construct Pilots, see the materials we use, you would realize why we have a "no trouble" car and why we are selling so many of them in sections where other cars cannot stand the service.

Guaranteed for One Year

Some manufacturers guarantee their cars for several thousand miles. It is DIFFERENT with the Pilot. You can ride 25,000 MILES if you want in one year, either on the Massachusetts boulevards or the deserts of Arizona and Nevada—it does not matter—the Pilot Guarantee is with you all the time. A LONG LIST OF SATISFIED OWNERS. LET US SEND YOU THEIR OPINION OF THE CAR. There is so little trouble with a Pilot that some of our agents are advertising to take care of the car for their customers the first year FREE OF ALL EXPENSE. HOW MANY AGENTS OF OTHER CARS DARE DO THIS? THIS IS THE PROOF OF RELIABILITY.

Pilots are not thrown together over night. Every car receives individual attention. We could make many more cars than we do if we made them with "hurry-up" and "get-them-out" methods, but THEN they would not be Pilots. The buyer who gets one of these good cars has an absolute assurance of the highest quality of service and the minimum of trouble and expense.

THE CAR WITHOUT A MECHANICAL DEFECT

Built To Wear—Not Just To Sell

Read the Specifications

Full-floating rear axles (absolutely guaranteed), chrome nickel steel shaft, 1⅝ inches in diameter; strongest axle bridge housing on any car; Brown-Lipe differential, famous Natcoal oil tempered springs, wheels of great strength with twelve spokes; double internal expanding brakes, Warner transmission (heavy enough for the strongest motor), cone clutch with auxiliary springs under leather facing, making very easy engagement; large size Mayo type radiator, 3⅜ core (German silver); control in center of car for convenience of driver; absolutely reliable irreversible steering gear. Sub-frame construction with shaft and bevel gear drive, and double universal joints between transmission and differential and V-shaped torsion rod to rear axle. Straight line drive and the strongest automobile construction on any car and found only on the very best and highest priced cars. New Departure bearings (Hoffman balls), Hess-Bright and F. & S. bearings used where best adapted for service. Springs, front half elliptic 36 x 2, rear very long half elliptic, 52 x 2 inches, insures easy riding. Genuine white lead and oil paint, 11 inch cushion and heavy Turkish upholstering on handsome jewel bodies, with entrance from either side—an exclusive feature—add beauty and refinement to these wonderful constructed cars.

Regular Equipment for All Models

Mohair top and hood, ventilating windshield, Warner autometer, Stromberg carburetor, Eisemann magneto, tire power pump, electric lights and electric starter (Gray & Davis system), electric and bulb horns, tool kit, tire repair outfit, jack, robe and toe rails, five electric lamps including lights in dash and large electric headlights, quick detachable, demountable rims, Auto Hind Reflector and Never-Out License Brackets, nickel finish throughout. THE MOST COMPLETELY EQUIPPED CAR EVER SOLD. Compare the above specifications and equipment with cars selling from $500 to $1,000 more in price and see if you can find a better car than the Pilot.

Special Equipment

Westinghouse Air Springs May Be Had as Special Equipment on All Models

Dealers and Agents!

If you have sold cars that have given poor service, the Pilot will redeem your reputation. If you are selling good cars, your competitor with the Pilot will keep you awake nights with his competition, the Pilot having so many good points YOUR car does not possess. You will be on the defensive ALL THE TIME, no matter what car you sell—even the very highest priced car. You will find your car will have to "step lively" to make even a showing with the PILOT in HILL CLIMBING, FLEXIBILITY, GENERAL ROAD WORK or any of the various and special tests which the shrewd car buyer requires to be performed satisfactorily before parting with his money.

Varnish No Longer Sells a Car

The wise car buyer looks under the body. He wants to know how strong are the FRAME and AXLES and what kind of BEARINGS are used. He wants a dependable CLUTCH that takes hold gradually and WILL NOT SLIP and the TRANSMISSION absolutely reliable and the gears of the best alloy steel. He wants TWELVE spokes in the wheels and the spokes must be 1⅜-inch or more or no sale. He must have a DRIVE SHAFT at least 1¼ inch in DIAMETER and material CHROME NICKEL STEEL. He wants his machinery ACCESSIBLE so that adjustments can be easily effected when necessary and without great expense. You can satisfy him on every essential with a Pilot. She is built right. NO COMPLICATED MACHINERY IN A PILOT. Adjustments are so easily made that any owner with but little mechanical knowledge can easily care for his car. And the equipment the FINEST AND MOST COMPLETE ever offered. Everything needed on a car is there, including the famous Gray & Davis system for Lighting and Starting, the finest electric lighting and electric starting system yet devised, and the price—quality considered—the lowest in the land.

AGENTS WANTED

(In Territory Not Taken)

WRITE US AT ONCE for the greatest agency proposition made by any manufacturer or distributor. WE CO-OPERATE with you in your territory and do not require you to tie up a lot of money in deposits. If you have another car agency or desire an agency or are thinking of purchasing a car you cannot afford to neglect this opportunity of knowing more about the Pilot—THE CAR WITHOUT A MECHANICAL DEFECT—but WRITE AT ONCE for beautiful art book showing the Pilot models in colors and a complete and detailed description of the cars. Also get our agency offer for your territory. IT WILL INTEREST YOU.

PILOT CAR SALES COMPANY, Richmond, Indiana

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RHINELAND R.B.F.

FAFNIR

Insurance for Builder & User
Universal Use & Reputation

FACTORIES IN THREE COUNTRIES

Strikes, Fire, Flood or War Cannot Stop Deliveries.

A FEW USERS OF THESE BEARINGS

PEUGEOT
PANHARD & LEVASSOR
DELAHAYE
DELAUNAY-BELLEVILLE
RENAULT
ESTABLIS HOTCHKISS
AUTO-METALLURGIQUE
SCHNEIDER
ISOTTA FRASCHINI
CLEMENT-BAYARD
CADILLAC
MERCER
PEERLESS
KISSEL KAR
LAUTH-JUERGENS
SEAGRAVE
MICHIGAN BUGGY CO.
PULLMAN
NATIONAL
MOON
GRAMM
AMERICAN
DAIMLER CO., COVENTRY
USINES PIPE
GEBRÜDER STOEWER
ADLERWERKE
CIE. D'AUTO FIACRES
NAGANT FRERES
CALTHORPE
MINERVA MOTORS

RHINELAND MACHINE WORKS CO.

140 West 42nd Street, New York



Full Number of Balls

One Piece Wrought Steel Separator

(NO RIVETS OR SCREWS)

OR

Solid Bronze or Aluminum Separator

Vessels of the German Navy have taken nearly half of our production for the past two years

WHY?

Complete stocks at all prominent trade centers *We sell at retail or wholesale*

MASCHINENFABRIK "RHEINLAND," A. G., Duesseldorf, Germany

RHINELAND MACHINE WORKS COMPANY, 140 West 12d Street, New York, N. Y.



Full Number of Balls

One or Two Piece Wrought Steel Separator

NO RIVETS OR SCREWS

The only European bearings made in America. Steel, balls and all methods imported from Europe. The most accurate bearing made. Adopted by General Electric Co. and Westinghouse Electric & Manufacturing Company

WHY?

Complete stocks at all prominent trade centers *We sell at retail and wholesale*

The bearing that is making New Britain famous

RHINELAND MACHINE WORKS COMPANY, 140 West 42d Street, New York, N. Y.
FAFNIR BEARING COMPANY, New Britain, Connecticut

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Full Number of Balls

One or Two Piece Wrought Steel or Bronze Separator

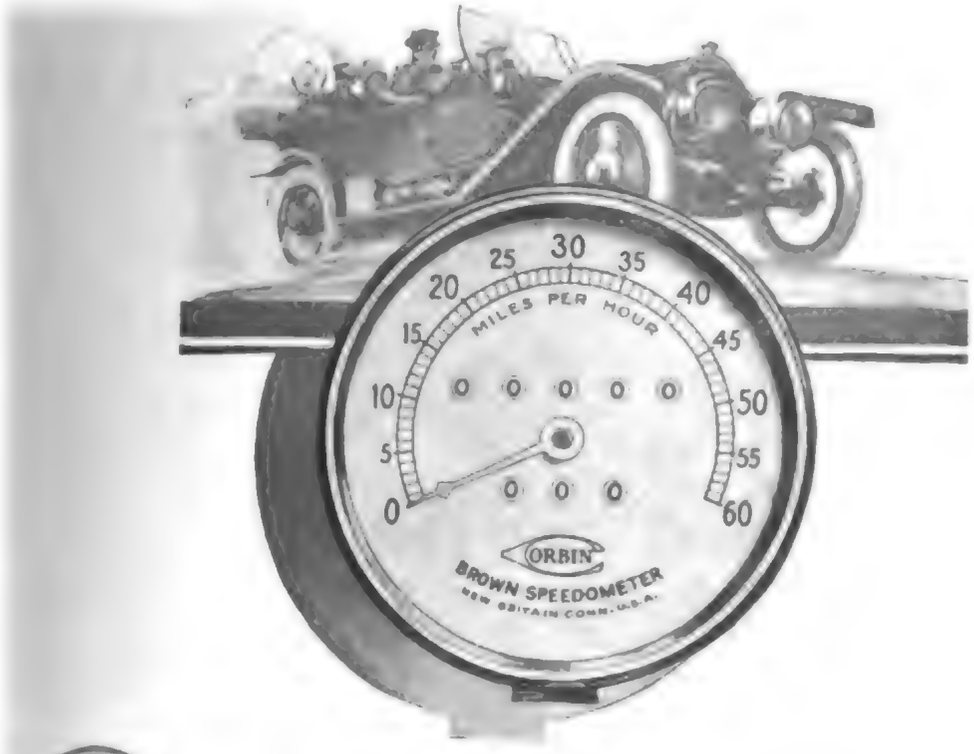
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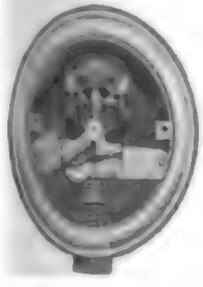
Ninety-five per cent of all French, Swiss and Italian automobiles use this bearing. The Peerless Motor Co. have always used it and still insist on sticking to it

WHY?

Complete stocks at al. prominent trade centers *We sell at retail or wholesale*

SOCIETE FRANCAISE DES ROULEMENTS A BILLES, Ivry (Seine) Paris, France
RHINELAND MACHINE COMPANY, HUDSON EXPORT & IMPORT COMPANY
140 West 42d Street, New York, N. Y.





The CORBIN-BROWN SPEEDOMETER

"The Speedometer of Permanent Accuracy"



Its mechanism is extremely simple.

Its centrifugal governor has four balance weights so sensitive that they respond to the slightest increase of speed.

This centrifugal principle of the Corbin-Brown is the same as that applied to the regulation of engines.

It insures absolute regularity of revolution regardless of temperature.

It is as accurate during the zero of Christmas as during the torridity of July.

Its few parts operate with practically no friction and therefore do not wear.

It records speed accurately from low mileage to high.

Its hand is steady; its odometer absolutely dependable.

The more advanced construction of its flexible shafting is an additional safeguard of accuracy.

This consists of a succession of eye-links and solid links as shown in illustration.

The solid link gives a smooth bearing which minimizes friction and insures smooth running.

The strength of these links makes breaking almost impossible.

However, if perchance one should break, the replacing with a new link is so simple that anyone can do it.

Every Corbin-Brown is calibrated by hand and tested to absolute accuracy before being sent out.

Each is built of specially hardened steel and brass, and with the precision of a high grade watch.

We have an unusually attractive proposition to offer dealers and car manufacturers. Write us today

THE CORBIN SCREW CORPORATION DIVISION
(The American Hardware Corporation)
213 High Street, NEW BRITAIN, CONN.

BRANCHES: NEW YORK CHICAGO PHILADELPHIA

Makers of the celebrated Corbin Coaster Brakes for Bicycles and Motorcycles

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What Shows Don't Show

By R. E. Olds, Designer

You'll see the new model of Reo the Fifth at your local Automobile Show.

It will strike you as beautiful, luxurious, roomy—having every final touch.

But here are things you can't see. And they mean, in the end, more than all that shows.

Tire Mileage

Tires on a car form the chief item in upkeep. Tire-saving means more than all other savings together. Every old motorist knows this.

So this year I add 30 per cent to my tire cost, to add 65 per cent to the average tire mileage. I give you tires 34 x 4. Compare them with rival cars.

The usual tires on this type of car would more than double your tire cost, so tire makers say.

No Possible Flaws

The steel in this car is twice analyzed, to make sure it accords with my costly requirements.

The gears are tested in a crushing machine, to prove that each tooth will stand 75,000 pounds. This test is usually made with light hammers.

The springs are tested in another machine, to stand 100,000 vibrations.

I use in this car 190 drop forgings. The average cost is twice that of steel castings.

But they give me lightness and strength. And hidden flaws can't occur in drop forgings.

The various parts of this car get a thousand inspections. Thus all the uncertainties are completely eradicated in building this Reo the Fifth.

No Broken Bearings

I use in this car 15 roller bearings, 11 of them Timken, 4 Hyatt High Duty.

They cost five times as much as the usual ball bearings. But good roller bearings don't break under strain.

No Overtax

It's the sudden shock which shows up a car's weakness, not the ordinary tests. And sudden shocks will come.

To withstand them, I give to axles and driving parts 50 per cent. over-capacity. I have made them all ample for a 45-horsepower car.

To prove them out, I ran one of these cars for 10,000 miles, at top speed on rough roads. I met at its worst every possible road shock, and not one important part gave out.

I use 14-inch brake drums. I use 2-inch, 7-leaf springs. I use costly steels — chrome nickel, vanadium, manganese—all to ward off an overtax. I place cost below safety in this Reo the Fifth.

No Troubles

That isn't quite true. All machines have their little troubles. But I've gone to the limit to save trouble with this car.

Each engine is tested 20 hours on the blocks, and 28 hours in the chassis. There are five long-continued tests.

My carburetor is doubly heated—with hot air and hot water—to save the troubles with low-grade gasoline.

I use a $75 magneto to save ignition troubles. I use a centrifugal pump, instead of a syphon, to insure the water circulation. That costs about $10 extra.

Cars are built slowly and carefully, parts ground over and over. I limit my output to 50 cars daily, so nothing shall be slighted.

No Skimping

To make the car show my infinite pains, I give equal care to the finish.

The body has 17 coats. The luxurious upholstering is of genuine leather, filled with the best curled hair.

There are three electric lights, and the dashboard lights are flush. And the whole car, even under the hood, is fully nickel-trimmed.

Center Control

Our center control is exclusive to this car. All the gear shifting is done by one small handle, completely out of the way. It is done by moving this handle only three inches in each of four directions.

Both brakes are operated by foot pedals. So no levers at all clog the way of the driver. And this permits of the left side drive.

No other center control will please a man who once discovers this.

Add $200 to My Cost

These extremes, I figure, add $200 to the necessary cost of this car.

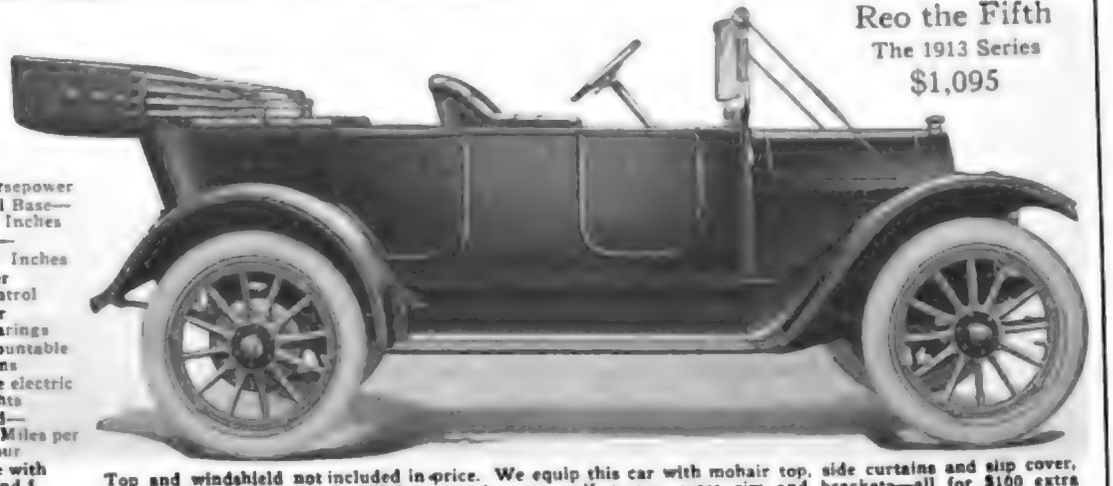
They cut down our profits. They force us to factory efficiency. They compel us to build every part ourselves. And, to minimize cost, we build only one chassis.

But these things save users from three to ten times what it costs me to give them to you.

They insure to you safety, economy, comfort. They insure to me that reputation I have spent 26 years in acquiring.

I find that car users, more and more, are coming to look for this class of car. Our output is always much oversold. And this year, with 60,000 excellent cars to my credit, the demand will be greater than ever.

A thousand dealers are now ready to show this new model of Reo the Fifth. Our 1913 catalog is also ready. Write us for it now.



Reo the Fifth
The 1913 Series
$1,095

30-35 Horsepower
Wheel Base—112 Inches
Tires—34 x 4 Inches
Center Control
Roller Bearings
Demountable Rims
Three electric lights
Speed—45 Miles per Hour
Made with 2 and 5 Passenger Bodies

Top and windshield not included in price. We equip this car with mohair top, side curtains and slip cover, windshield, gas tank for headlights, speedometer, self-starter, extra rim and brackets—all for $100 extra (list price $170).

R. M. Owen & Co. General Sales Agents for **Reo Motor Car Co., Lansing, Mich.**

Canadian Factory, St. Catharines, Ont.

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To Reo Dealers—and Others

We know all the advantage of folderols in a car. And we are giving that advantage to Reo the Fifth.

This year, a wider, longer body—three electric lights—flush dash lights. And a self-starter included in the hundred-dollar equipment.

A 17-coated body, the best of upholstering, every finishing touch, and nickel trimmings even down to the engine.

The coming left-side drive, without any side levers. An exclusive center control, which appeals to users more than any other.

A stunning appearance, remarkable finish, luxuriousness, comfort, convenience and room. Not a car in this class can compete now with the Reo in all of these selling attractions.

But Real Worth Counts

But you know, as we know, that in the long run it is service and economy that count.

All the other attractions diminish in time. What men keep before them is the endurance, the lack of trouble, the low cost of upkeep.

That's where our main effort centers. Any man who knows Mr. R. E. Olds knows him to be an extremist.

He knows what is needed. And 26 years spent in building cars have shown up all the shortcomings, taught him endless precautions.

Reo the Fifth will secure its chief fame, its enduring prestige, through the infinite pains which he takes with this car.

If you are building, as we are, for the years to come, those features will count with you.

Big Tires This Year

How Mr. Olds is working to cut cost of upkeep is shown in this year's tires.

Tires 34x4 will give twice the average mileage of tires 32x3½.

Their adoption this year increases our tire cost about 30 per cent over last year. But this is only one outward example of the countless perfections in every part of this car, all working toward upkeep economy.

Other cars at a glance may look equal to this car. But there isn't a car within range of this price which competes on the points we bring out in our ads.

The Car of the Future

Men are coming, we think, to seek more and more for a car built like Reo the Fifth.

Last year's demand, every month of the year, was far in excess of our output. It ran five times our production at times.

And all those last year's cars will argue for better-built cars than the common.

This demand will grow. Every man knows that it should grow. Every Reo the Fifth, in every community, is proving the value of a car like this.

And you know that sound business, either for makers or dealers, can't be built on a lesser basis.

Our Wonderful Advertising

This year, as last year, we shall constantly go to every car buyer—in country and city—with our telling salesmanship-in-print

It will be, as it has been, the most efficient advertising ever done in the motor car line.

We are doing more than is necessary, perhaps by twice over, to create a lasting impression, to build a firm reputation.

We stand for better cars, and our purpose is to make this stand effective.

Every motor car buyer, wherever he lives, is being all the time told about Reo the Fifth. And the matter and manner make a wondrous impression, you know as well as we.

And the past year has taught you what an overwhelming demand this advertising brings to the dealer.

Now a Larger Output

The factors which last year held back our production are not in existence now. We do not rush cars, whatever the pressure. And we have no desire to compete with others on quantity.

Mr. Olds sets his limit at 50 cars daily. But we run at full headway every month of the year. And our advertising is arranged so that, even in dull months, the demand exceeds our production.

This continuous, unvarying, year-round trade makes Reo the Fifth a very good car to handle. We aim to keep dealers and factory men busy winter and summer, and our advertising so far has done that.

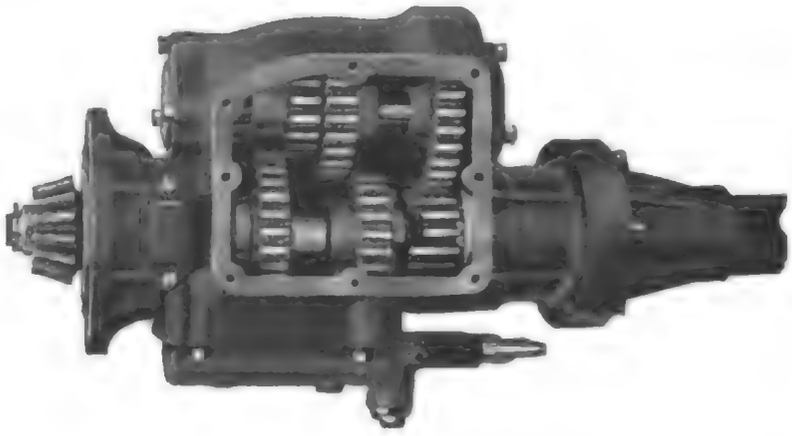
R. M. Owen & Co., General Sales Agents for **Reo Motor Car Co., Lansing, Mich.**

Canadian Factory, St. Catharines Ont.

(127)

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COVERT



Transmission Building Is a Specialty

We believe that Covert Transmissions are the best produced today. They are made of the best materials by men who are transmission specialists. From the drafting room to the final inspection every process of manufacture is most efficient. These are just a few reasons why Covert Transmissions are better.

Now as to why they are more economical. We have a large plant and produce transmissions in great quantities. Every man in our plant thinks of nothing but transmissions. how to make them better—how to make them faster. This assures the highest possible quality at the minimum cost.

Manufacturers with the finest equipped plants are rapidly coming to see that the making of transmissions must be considered on the same plane as speedometers, carburetors, etc.

Let us quote you prices on transmissions for your new models. We can make them better—more economically—which facts have been sufficient to close contracts for a surprisingly large number of 1913 and 1914 pleasure and commercial cars.

Covert Motor Vehicle Company

Sales Office
Ford Building, Detroit, Mich.

Factory
Lockport, N. Y.

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Champion Priming Plugs
End All Winter Starting Trouble

Every car owner is up against the priming question today.

The trouble is greater this winter than ever before because the gasoline is of lower test.

Champion Priming Plugs are indispensable to the many thousands of cars that have not priming cups.

They are even badly needed on cars that have them, because the cups cannot place the gasoline right at the firing points.

Champion Priming Plugs deliver the few drops required just where they are needed.

The gasoline goes direct to the plug's base through an enclosed channel — firing cannot soot-up the porcelain nor burn the firing points.

Priming is done quickly, simply and safely. If you should happen to start without tightening the needle valve top, the hot exhaust could not endanger the porcelain.



Champion Priming Plugs have been given every test, and are strongly recommended to dealers by manufacturers of those cars that are not regularly fitted with priming devices.

These recommendations were not made until the manufacturers were convinced of the thorough reliability of **Champion Priming Plugs** under the most severe conditions.

Champion Priming Plugs are made in the largest factory in the United States devoted exclusively to spark plugs.

They are backed up by the fact that our regular priming plugs are specified by the manufacturers of over 60 per cent. of the cars now running in America.

You run no risk in buying **Champion Priming Plugs**, because, like the rest of our product, they are exchangeable for any other type of spark plug on our list.

Dealers should order **Champion Priming Plugs** in 100 lots in order to get the lowest possible discount.

FOR SALE EVERYWHERE AT $1.25 PER PLUG

Trial Set of Four Champion Priming Plugs, Fully Guaranteed, Prepaid, to Any Car Owner for $5. Give Name of Car and Year of Make—Also Name of Your Dealer.

All jobbers and most dealers are already supplied. Write today. Liberal trade discount to dealers. Be ready to supply your trade while our big campaign is calling the attention of car owners everywhere to these priming plugs.

Champion Spark Plug Company

106 Upton Ave. Toledo, Ohio

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The Triplex Ford Engine Starter



How Are Your Ford Cars Started?

DO YOUR OWNERS STILL STRADDLE THE BUMPER AND CHURN THE CRANK?

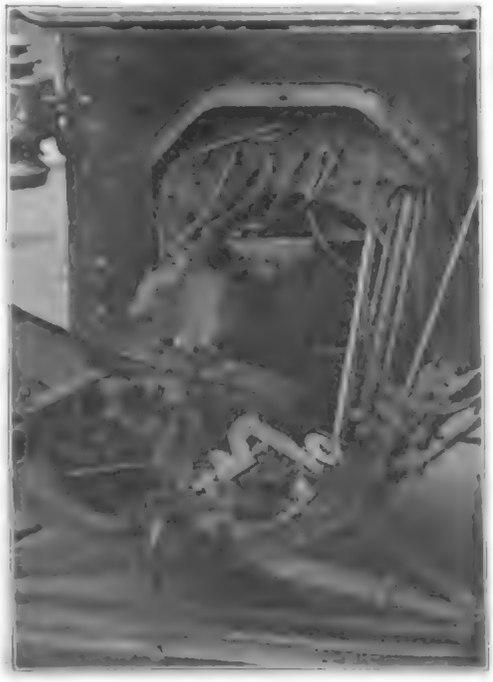
You Will Give Them This Message If You Appreciate the Unequaled Advantages of Starting the Ford Car With the TRIPLEX ENGINE STARTER.

The TRIPLEX FORD ENGINE STARTER is a mechanical starter, which, of all types—compressed air, acetylene gas, electric and spring—is the only one on the market which at all times proves absolutely RELIABLE. In no respect is it a "Hit-or-Miss" proposition—working one minute and short circuiting or blowing out a cylinder head the next. It gives 100 per cent. uninterrupted service from the time it is attached. It comprises so few parts and is so simple and direct in application that it cannot get out of order, and it is as safe and durable as it is simple and effective.

You do not have to leave your seat to start the Ford Motor, WHEN EQUIPPED WITH THE TRIPLEX STARTER.

All that is necessary is to pull the lever. Will absolutely start the Ford 1,000 times out of 1,000.

Can be easily attached in one hour's time. Absolutely no holes to drill or mechanical work necessary to install same. Absolutely guaranteed to outlast the motor.



DEALERS: It doesn't require SALESMANSHIP to sell an ARTICLE for which every FORD OWNER is clamoring. Bring the TRIPLEX FORD ENGINE STARTER AND THE FORD OWNER together and a sale results.

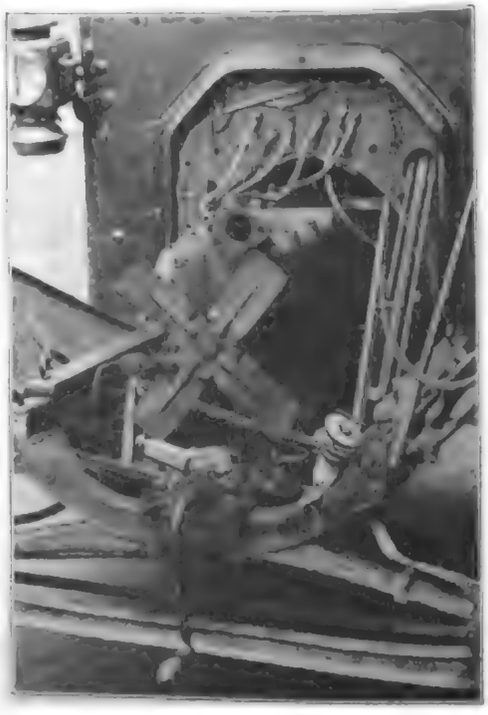
Price $11.50

Your Commissions Are Liberal

BREMER-WILSON MANUFACTURING CO.

1256 Michigan Ave., Chicago, Ills.

Western Representative,
AUSTERMELL & HANSON,
560 Phelan Bldg.,
San Francisco, Cal.





The Triplex GUARANTEE

The Triplex finishes the work the carburetor leaves half done.
The Triplex makes imperfect carburetion a mechanical impossibility.

Sixty Day Trial Proposition.

The Triplex is guaranteed to decrease fuel consumption 25%, increase power, prevent carbonization, prevent Back Firing, effect easy starting.

The Triplex will increase mileage, promote flexibility.

The Triplex will equalize the most uneven mixture that leaves the carburetor—make it uniform throughout.

The Triplex utilizes every drop of gasoline to its full capacity, making a saving of over 25% per gallon. It gives you five gallons of fuel at a cost of four. It makes high-grade gasoline out of low.

INSURE YOUR CAR Against Fire By Using a Triplex.

A back fire is impossible with a TRIPLEX, due to the fact that any flame is cut off before it reaches the raw fuel in the carburetor. Fire cannot pass through a TRIPLEX. The principle is the same as the non-explosive feature of the miner's gauze lamp.

The Triplex makes starting easier regardless of temperature or atmospheric conditions, and stops suction of live gasoline when the motor is cold.

The Triplex increases power proportionately. The full cylinder charge is ignited every time—the maximum power delivered at the point of highest efficiency. Because there is no fuel waste, there is no power waste. A TRIPLEX is a double economy—it INCREASES power at the same time it DECREASES fuel consumption.

The Triplex can be readily attached by anyone in one-half hour's time.

The Triplex is sold with the understanding that if it does not do as we claim we will gladly refund your money at the end of sixty days.

90 %
OF THE AUTOMOBILES DESTROYED BY FIRE ARE CAUSED BY A BACK FIRE IGNITING THE RAW GASOLINE IN THE CARBURETOR

PRICES

1	in., $3.50	1¼	in., $5.00
1¼	in., 4.00	2	in., 5.50
1½	in., 4.50	2½	in., 6.00

In ordering Give MODEL, H. P., and Make of Car.

To be had at all dealers, or direct on receipt of price.

DEALERS—Here is one of the fastest selling devices on the market. Every motorist has got to have one. **Big sales spell big profit. Write or Wire Today for our Sales Proposition.**



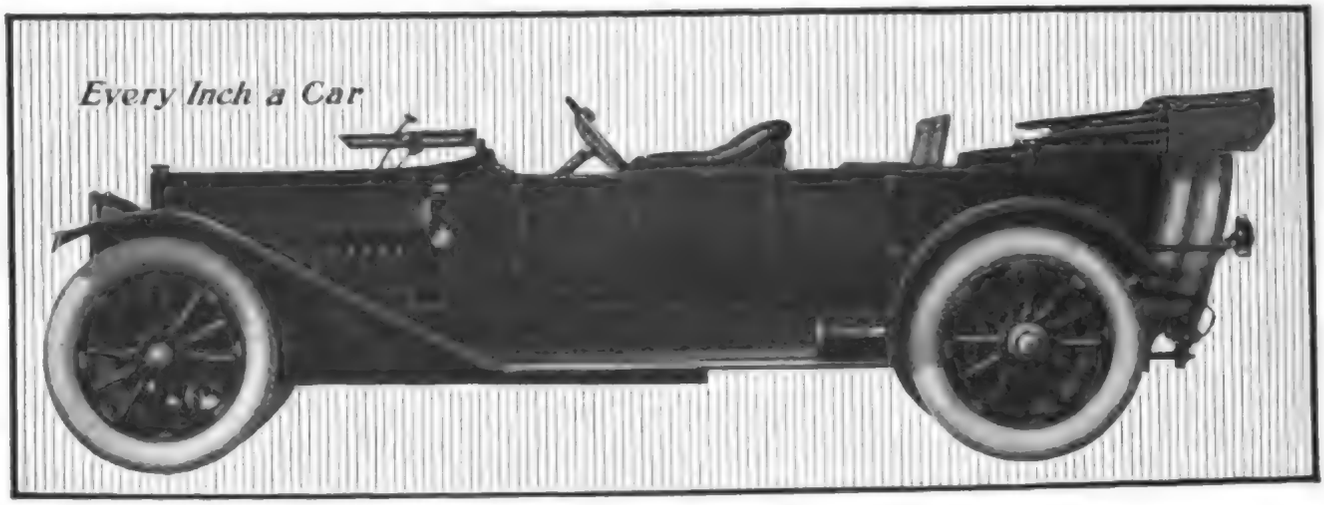
WRITE DEPT. 10.

BREMER-WILSON MANUFACTURING CO.
1256 MICHIGAN BLVD. CHICAGO, ILL.

WESTERN REPRESENTATIVES
AUSTERMELL AND HANSON
560 PHELAN BLDG. SAN FRANCISCO, CAL.

Triplex

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KISSELKAR

Exhibit at New York and Chicago Shows—Pleasure Cars

New York—No. 22 Grand Central Palace
Chicago—No. M1 Coliseum Annex

the car of liberal design

LIBERAL design means greater comfort, greater durability, more impressive appearance, lower up-keep and slower depreciation. It is one of the factors that separates the KisselKar from average automobiles, and makes it a conspicuous value—a distinctive achievement in motor car engineering and manufacturing.

SIT in a KisselKar—immediately you sense the unusual roominess of the tonneau—one factor of the liberal KisselKar design.

Lounge back in the seats—here is another surprise, a result of liberal design. Never before have automobile seats been made so exceptionally deep, encouraging the completest relaxation. This, and the eleven inches of softest upholstery, give you the most luxurious ease.

Ride in the KisselKar—there's a steadiness and softness of motion immeasurably superior to every previous idea of car comfort—it is super-comfort, due to liberal design.

The generous KisselKar wheelbase is the basis of this rare riding comfort. If a car is to be roomy, and at the same time have the "balance" which causes a car to ride with steadiness and handle responsively, it must have a liberal wheelbase in proportion to the roomy body. No car can equal KisselKar roominess, comfort and ease of driving without equaling the wheelbase—and few cars do.

Ride on rough roads—here is where the liberal KisselKar design discloses its comfort value. The generous wheelbase modifies the irregularities of the road—springs built according to the weight of each model—shock absorbers and eleven inches of resilient seat upholstery absorb the road vibration. The unusually deep seats permit you to relax in a way so that side sway or lurches do not disturb you—no tendency to brace yourself.

The one who drives will appreciate the unusual roominess of the front compartment—the "balance" that makes the KisselKar easy steering and lightfooted in picking the road.

Every part of the car shows the liberal KisselKar design—transmission, differential, steering knuckles, brake drums, etc., securing a greater safety margin, minimizing up-keep and depreciation.

Go to a KisselKar dealer. He will afford you every opportunity to convince yourself of KisselKar superiority—the super-comfort, the distinction and the roadability by which the KisselKar gives the owner a pride and satisfaction he can secure in no other way.

"Thirty" . .	**$1700**
"Forty" . .	**$2000**
"Fifty" . .	**$2500**
60 H. P. "Six"	**$3150**

Fully Equipped—Electric Started and Lighted

KisselKar Service doubles every dollar of car value. KisselKar Service cares for your car—and nothing responds to good care more than an automobile. Specially constructed and equipped buildings are maintained by the manufacturers at principal points of America. These are service-centers, carrying complete stock of spare parts, supplying service direct, and through cooperation with sales agencies.

Write for 1913 Catalog—This catalog is a valuable aid in judging automobile values. It illustrates and describes the full line of KisselKar pleasure models.

KisselKar Trucks—1500 lb., 1, 2, 3, 4, 5 ton Trucks—Delivery Wagons, Fire Department Apparatus, Ambulances, etc. **Write for truck catalog.**

Kissel Motor Car Co.

159 Kissel Ave. Hartford, Wis.

BRANCHES AND AGENCIES

Boston New York Chicago Milwaukee
Kansas City Los Angeles Minneapolis
St. Paul Dallas

Philadelphia, Cleveland, Detroit, El Paso, San Antonio, New Orleans, Baltimore, Omaha, Butte, Denver, San Francisco, Seattle, Portland, Duluth, Buffalo, Pittsburgh, Hartford, Conn., New Haven, Albany, Troy, Montreal, Quebec, Toronto, Winnipeg, and 200 other principal points throughout America.

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No-Rim-Cut Tires—10% Oversize

12 Years in 1—and Over

Our fiscal year ended November 1.

We sold in that year 918,687 automobile tires—a gain of 125 per cent over 1911.

Our greatest previous gain was 100 per cent.

Last year's sales by far exceeded all our previous twelve years put together.

They were enough to equip completely 230,000 cars. Yet the demand last year exceeded our output by 400,000 tires.

These are facts to ponder, if you own a car:

Why has this tire so outsold all the others?

Why are sales doubling faster than we can build factories, after seventeen hundred thousand have been tested out?

You know, as we know, that nothing has done it save lessened cost of upkeep.

In this day of odometers, men are making comparisons.. These figures reveal the result.

Next Year—500,000 Cars

The percentage of increase which we are maintaining will next year mean an output of 2,000,000 tires.

That will mean to equip, in a single year, 340,000 cars with Goodyears.

Contracts with car makers seem to ensure that nearly half of next year's new cars will go out with Goodyear tires.

Think what that means—about as many Goodyear tires as all other makes together.

The demand from car users is increasing at an even greater rate.

Major Savings

The flood of demand began with the advent of No-Rim-Cut tires.

This patent tire ended rim-cutting forever. And that, as shown by careful statistics, saved 25 per cent of tire cost.

Men are quitting clincher tires by the tens of thousands to get rid of these rim-cutting troubles.

Then we made these tires—our patent type—10 per cent over the rated size. And that, with the average car, adds 25 per cent to the tire mileage.

These two features of ours cut the average tire bills 48 per cent. They are saving tire users now, we figure, a million dollars monthly.

Mileage Tests

Then we built a machine on which four tires at a time are worn out in our factory under all road conditions.

Year after year we have used that machine to compare fabrics and formulas, methods, materials and ideas. We have also compared rival tires with our own.

The mileage is mastered, and the meter told us when we reached the limit—when we had the best tire in existence.

Then the odometer on thousands of cars told the same story to users. That's the reason for this wondrous Goodyear growth.

1,700,000 Used

Up to November 1st men had put into use 1,700,000 of these tires. They are running now, we figure, on 250,000 cars.

The present sale—918,687 last year—is a simple result of those tests.

You can't for a moment think these men mistaken, after all these years, after all these tests. They are seeking just what you seek—lesser cost per mile.

They are using odometers—keeping records of cost. And a quarter-million such men have come to Goodyear tires.

Doesn't it seem to you reasonably certain that the same tests would win you?

Our Latest Invention

The Winter Tread

The latest service our experts have rendered lies in this Non-Skid tread.

Not a regular tread with short-lived corrugations. But an extra tread made of very tough rubber, giving a double thickness.

This thick extra tread gives us deep-cut blocks. They last for thousands of miles. They present to the road surface countless edges and angles, which grasp with a bulldog grip.

The blocks meet at the base, so the strain is distributed over the fabric, just as with smooth-tread tires. This invention alone, our experts say, will double the life of non-skids.

Please make your comparisons. The advantages here will be obvious to you. You'll see that we have solved the problems.

Write for the Goodyear Tire Book—14th-year edition. It tells all the ways to save on tires.



GOODYEAR

AKRON, OHIO

No-Rim-Cut Tires

With or Without Non-Skid Treads

Note the double-thick tread, to give multiplied endurance.

Note the deep-cut blocks.

Note the sharp edges and angles, facing every direction.

Note how the blocks widen out at the base, so the strain is distributed. It never comes on a small part of the fabric.

Our experts spent three years on this difficult problem. And we think they've solved the skidding question as it never was solved before.

200,000 have been tested out.

THE GOODYEAR TIRE & RUBBER COMPANY, Akron, Ohio

Branches and Agencies in 103 Principal Cities
More Service Stations Than Any Other Tire

We Make All Kinds of Rubber Tires, Tire Accessories and Repair Outfits
Main Canadian Office: Toronto, Ont. Canadian Factory: Bowmanville, Ont. (908)

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WARNER
AUTO-METER
The Dominant Speedometer

These famous cars are now all equipped with the famous Warner

Ahrens-Fox
American
Armleder
Austin
Buffalo Electric
Cadillac
Chalmers
Church-Field Electric
Cino
Columbia
Cunningham
De Launey Belleville
Flanders
Garford
Grand Rapids Truck
Grant
Grinnell Electric
Haynes
Hupp-Yeats
Jenkins
King Truck
Knickerbocker
Lozier
Marion
Marmon
Matheson
McFarlan
Midland
Ohio Electric
Oldsmobile
Overland
Packard
(in combination.)
Paterson
Pierce-Arrow
Pilot
R-C-H
Republic
S. G. V.
Simplex
Stafford
Staver
Stearns
Stevens-Duryea
Stoddard-Dayton
Suburban Truck
Vera Six

¶ Every manufacturer on this list paid *100 per cent. more* for Warner Speedometers than he would have had to pay for other Speedometers.

Draw your own conclusions.

The Warner Instrument Company
Beloit, Wisconsin



Model O-2
Price $145

"Whitney" Chains

The Most Practical for Motor Vehicles



WE call your attention here to "Whitney" Cotter Detachable Chains as the most practical chains ever offered for motor vehicles. They have made a record for themselves which no other Detachable Type has approached.

This Cotter Pin feature is so practical and necessary that it calls for little detailed explanation. The illustrations tell their own story, proving that this form of construction is logical and necessary for chain equipped motor vehicles. This Cotter Detachable Chain can be taken apart at any link and lengthened, shortened or repaired without the use of any special tool, as the Cotter Pin can be removed with pliers, screw driver or any sharp pointed instrument. The use of Whitney Cotter Detachable Chains assures the builder, owner and driver of commercial vehicles uninterrupted service on account of the ease of repair.

"Whitney" Chains are made from steel best adapted for the purpose, carefully hardened and calculated to resist the most wear, while in the matters of machining and assembling the utmost care is exercised and thorough inspections and tests characterize each process of manufacture. Their future service, however, depends entirely upon the care, alignment and adjustment, for the best chain in existence cannot withstand the evil influence of improper adjustment and lack of lubrication.

It will pay you, Mr. Manufacturer and Dealer, to get better acquainted with the "Whitney" Chains which are today standard on the majority of commercial vehicles. Write for our illustrated catalog which shows top and side views of each size of all Roller chains manufactured by us.

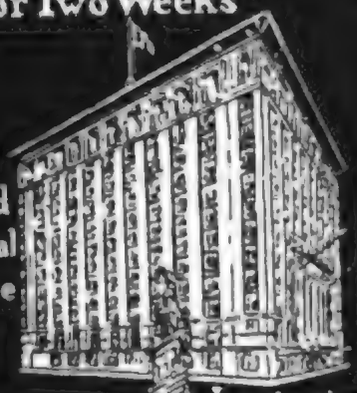
The Whitney Manufacturing Co., Hartford, Conn.

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NATIONAL

AUTOMOBILE SHOW

In Two Buildings For Two Weeks



Grand Central Palace

Lexington Avenue 46th-47th St



Madison Square Garden
Madison Ave, 26th-27th St

January 11 to 18
Pleasure Cars
(Gasoline and Electric)
Motorcycles
Parts and Accessories

January 20 to 25
Commercial Cars
(Gasoline and Electric)
Parts and Accessories



One Admission To Both Buildings

The Car That Has Solved the Delivery Problem



Panel Body $1800
Capacity 1500 lbs.

Lippard-Stewart

The Delivery Car

CHASSIS
List $1650

BODIES
Standard Panel....$150
Standard Express $125

The Lippard-Stewart Model "P" Delivery Car—30 Horsepower

What Will This Car Do for Me? This is the vital question, regardless of whether you consider the Lippard-Stewart Delivery Car from the view point of a probable owner or prospective dealer. Considered from the owner's standpoint, it is a car that assures you a prompt, thorough, efficient and economical delivery system at all times. If you are a dealer, it is a car that will help you build a profitable and constantly increasing business upon the sound platform of satisfied customers.

Here Is an Ideal Delivery Car—built by men who have made this distinctive line of motor car construction a specialty. Men who know the requirements demanded by delivery service, and last but not least—understand how to meet these demands. Transportation experts—men who when they built the Lippard-Stewart Delivery Car designed and built it a delivery car from the ground up. A practical commercial vehicle, not a commercial body on a pleasure car chassis. Strong, dependable and serviceable—a car that will deliver more goods over a wider territory at less cost per package than is possible with horse and wagon. Low in first cost. Economical in upkeep.

Examine Its Perfect Chassis—strong yet simple in construction—with its frame built heavier and wider at the point of greatest stress and reinforced with corner gusset plates. Note the 30 Horsepower Continental Motor. Consider the rugged cone clutch and the transmission strong enough for a 50 H.P. Car. Observe the shaft drive, the differential, the simplicity of construction practiced throughout the entire building of the car and the easy get-at-ability of every important mechanical part even when the car is loaded. Look at the perfect spring suspension that assures easy riding and minimizes wear and tear. Then—

Consider the Price of the Car—its sound dollar for dollar value. Compare it with any delivery car apparently competing with it. Note how the Lippard-Stewart Car actually baffles competition. Then as a dealer form your own conclusions as to the car's value as a business investment—its ready salability and the quick turnover of capital it assures.

Note the Comprehensive Lippard-Stewart Line—the volume of sales it makes possible—a line that offers you a car to meet the specific demands of practically every firm and individual who need a delivery car regardless of their business. A line that knows no dull seasons and a car that practically sells itself and stays sold winter or summer.

Read These Special Features of Lippard-Stewart Construction: Continental 30 H. P. Motor, Eisemann Magneto, Brown-Lipe Selective Transmission, Cone Clutch, Full Floating Timken Rear Axle, Timken Roller Bearing throughout, Left Hand Drive, Pneumatic Tires, 35 x 4½ Front and Rear—full equipment of Lamps and Tools.

We Want Good Dealers Everywhere. We have a splendid opportunity to offer first-class, up-to-date, energetic men—men who can measure up to our standard of integrity and business ability. If we have no dealer in your town and if you are the logical man to represent us—a man who can grasp the big possibilities of our proposition and can handle it in the way it should be handled, write us instantly.

See Our Exhibits at the New York, Boston and Chicago Shows

Lippard-Stewart Motor Car Co. BUFFALO NEW YORK

AUGUST BECKER, President
J. C. MILLAR, Secretary
W. F. REYNOLDS, Sales Manager
E. J. BARCALO, Treasurer
C. S. DAHLQUIST, Chief Engineer

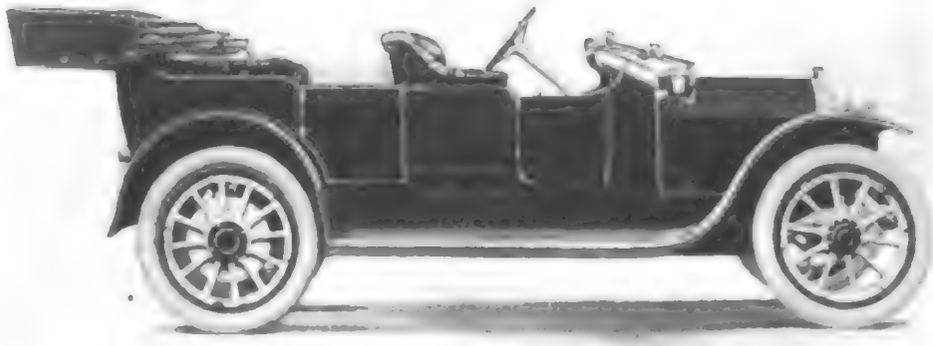
LIPPARD-STEWART MOTOR CAR CO.
Buffalo N. Y. (M. W.)

Please send catalogue and dealers' proposition immediately.

Name .....
Street .....
City ..... State.....

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"The Easiest Riding Car In The World"



The MARMON "32"

The graceful and beautiful lines of the new bodies distinguish the latest series Marmon "32" at a glance. The many refinements in equipment and appointments add to the comfort, luxury and ease of operation. But underlying all the new features is the same high standard of design, materials and construction that has made these cars world-famous in contests and service. No one can question the judgment of the Marmon owner in his choice of this car. The records of its performance are the highest indications of value.

Outline Specifications

Motor—4½" x 5", "T" head, 32-40 h. p. **Oiling**—Marmon system automatic force feed lubrication. **Ignition**—Two spark dual system. **Transmission**—Selective sliding gear, unit with rear axle. **Clutch**—Cone. **Rear Axle**—Floating type, unit with transmission. Pressed steel housing. **Brakes**—Internal expanding, 403 sq. in. surface. **Wheelbase**—120 in. **Rims**—Quick detachable, demountable. **Tires**—35 x 4½ front and rear. **Control**—Left-hand steering, right-hand control in center. **Carburetor**—Improved automatic float feed. **Springs**—Rear, full elliptic; front, semi-elliptic. **Body**—Marmon perfected cast aluminum construction with sheet metal seat backs. Deep cushions. Nickel trimmed. **Equipment**—Electric starting and lighting system with storage battery, Pantasote top, built-in windshield, speedometer and clock, electric light to illuminate entire dash, horn, shock absorbers front and rear, single tire carrier, extra demountable rim, coat rail, foot rest, assortment of tools, oiler, jack, tire repair kit and pump. **Prices**—Five-Passenger Touring Car or Four-Passenger Suburban, $3000.00; Two-Passenger Roadster, $2900.000; Limousine (seats seven) $4000.00; Landaulet (seats seven) $4100.00; prices f. o. b. factory, Indianapolis, Ind.

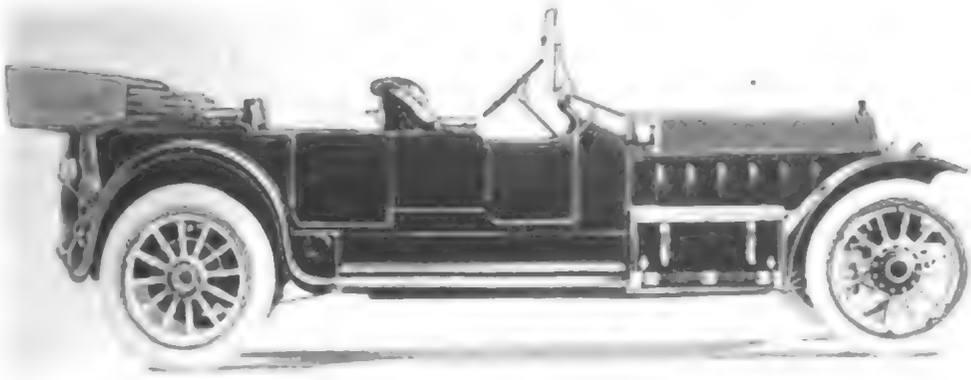
Nordyke & Marmon Company

Indianapolis [illegible] **(Established 1851)** **Indiana**

Sixty Years of Successful Manufacturing

Digitized by Google

"The Easiest-Riding Car In The World"



The MARMON SIX

When it became known there was to be a Marmon Six it was generally believed it would prove a car of surpassing value. During the time the Marmon Six has been under development and test we believe we have overlooked nothing that would add to the quality or capability of the car or that would enhance the safety, the comfort or the convenience of its user. So far as any test can be applied it is a proven car—brought to a place where we can say, "Here is a car that will live up to the Marmon name"

Outline Specifications

Motor—4½" x 6", "T" head, 48-80 h. p. **Oiling**—Marmon system automatic force feed lubrication, delivering oil through hollow crank shaft directly into main bearings, connecting rod bearings and piston pin bearings, also through hollow cam shafts to cam shaft bearings. **Ignition**—Two spark dual system. **Clutch**—Improved dry plate multiple disc. **Rear Axle**—Floating type unit with transmission. Pressed steel housing. **Front Axle**—A new type, an exclusive feature of the Marmon Six. The vertical spindle is placed in the direct center line of the wheel. This construction makes the safest, surest and easiest steering mechanism ever devised. **Brakes**—Internal expanding, 403 sq. in. surface. **Wheelbase**—145 in. **Rims**—Quick detachable, demountable. **Tires**—Front 36 x 4½, rear 37 x 5; front and rear rims and tires interchangeable. **Steering Gear**—Left hand with center control. **Carburetor**—Improved automatic. **Springs**—Front, semi-elliptic; rear, ¾ elliptic. **Body**—Convex curve type Marmon perfected cast aluminum construction with sheet metal seat backs. Deep cushions. Nickel trimmed. **Equipment**—Electric starting and lighting system with storage battery, cape top, windshield designed as part of dash with provision for ventilation, speedometer and clock, electric light to illuminate entire dash, electric step light under tonneau doors, electric emergency lamp with long extension cord, electric horn, power tire pump, shock absorbers front and rear, tire carrier, extra demountable rim, coat rail, foot rest, assortment of tools, oiler, jack, and tire repair kit. **Prices**—Seven, Five, Four or Two-Passenger Body Types, $5000.00; Limousine (seats seven) $6250.00; Berlin Limousine (seats seven) $6450.00; Landaulet (seats seven) $6350.00.

Nordyke & Marmon Company

Indianapolis (Established 1851) **Indiana**

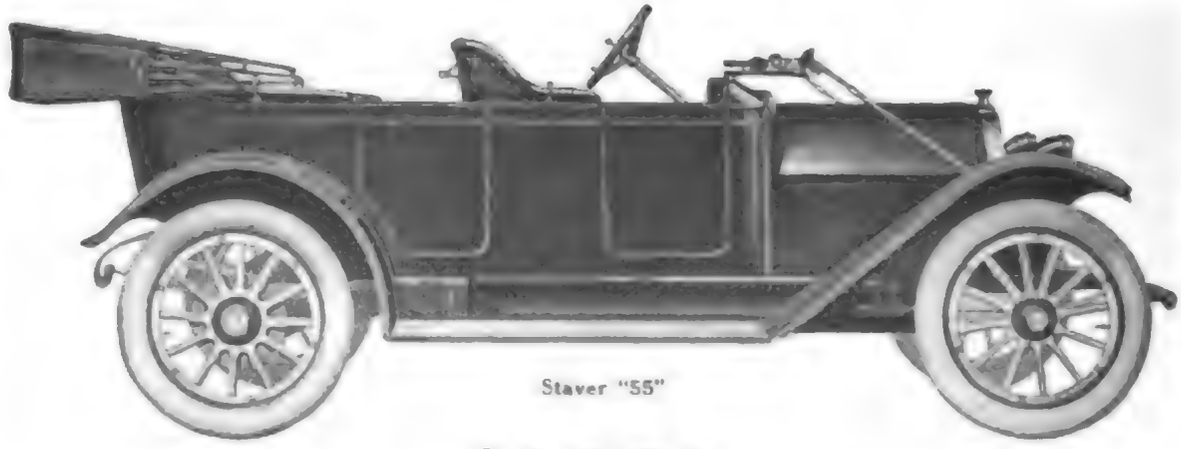
Sixty Years of Successful Manufacturing

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STAVER

The only stock Touring Car to finish with a perfect score in "Round-Lake-Michigan" Endurance Run

1069 Miles



Staver "55"

$2250

The remarkable merits of the Staver car are now being nationally recognized.

The Staver gave another wonderful demonstration recently, of what constitutes a superlatively good automobile. Two years in succession winning one of the most gruelling road tests on record, emphasizes the consistent qualities of Staver cars.

We have been deluged with telegrams from every part of the country, demanding to know our plans for 1913.

2000 CARS

That's the output for this year. Three chasses—cars that have no superior at any price—anywhere. Every improved equipment. Positive starter—electric lights (generator). Bodies made in our own shops—luxury—power—fitness to defeat competition. Backed by a great factory and a name that is a household word.

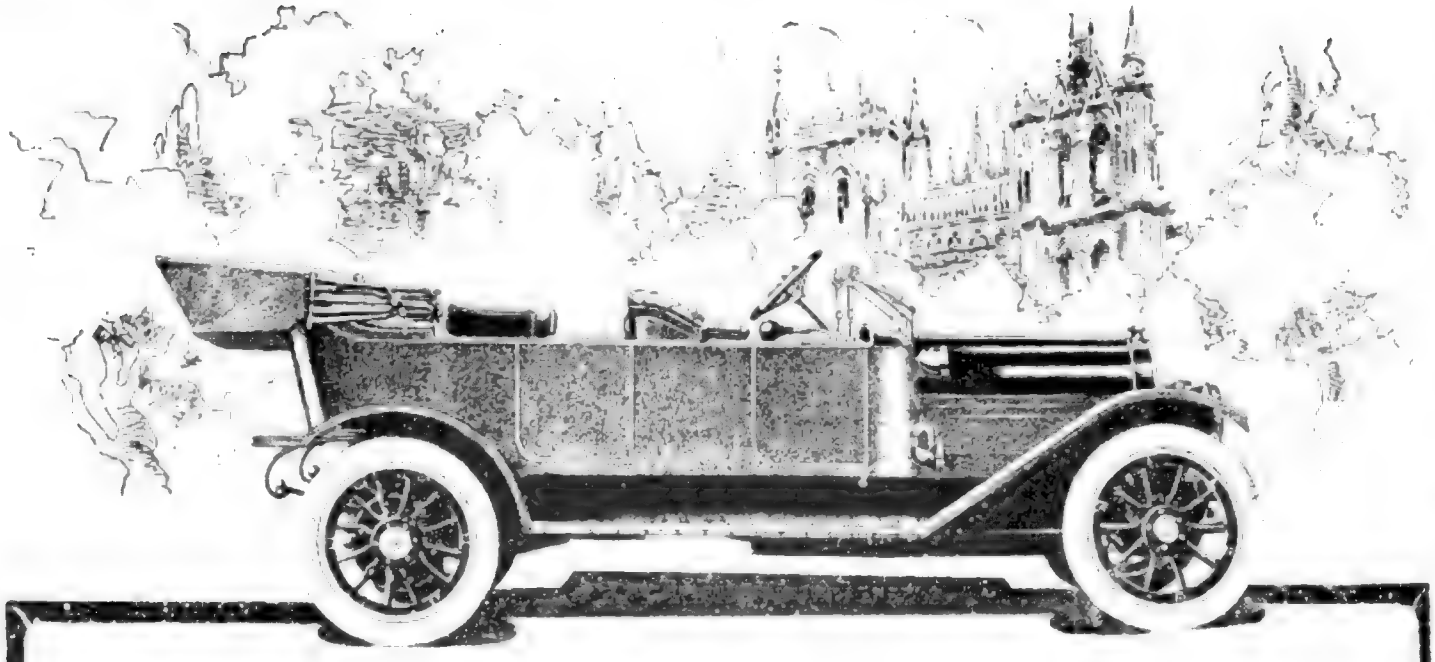
We do business in a liberal manner. Wire or write us.

STAVER CARRIAGE COMPANY, CHICAGO, ILL.

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COMPLETE and modern in every respect the Pullman line for 1913 offers a dealer opportunity unexcelled by any manufacturer.

Not alone in the value the car itself presents to the prospect does the Pullman proposition offer a splendid opportunity but in the co-operation and selling assistance given to the dealer as well. is the Pullman agency a valuable asset.

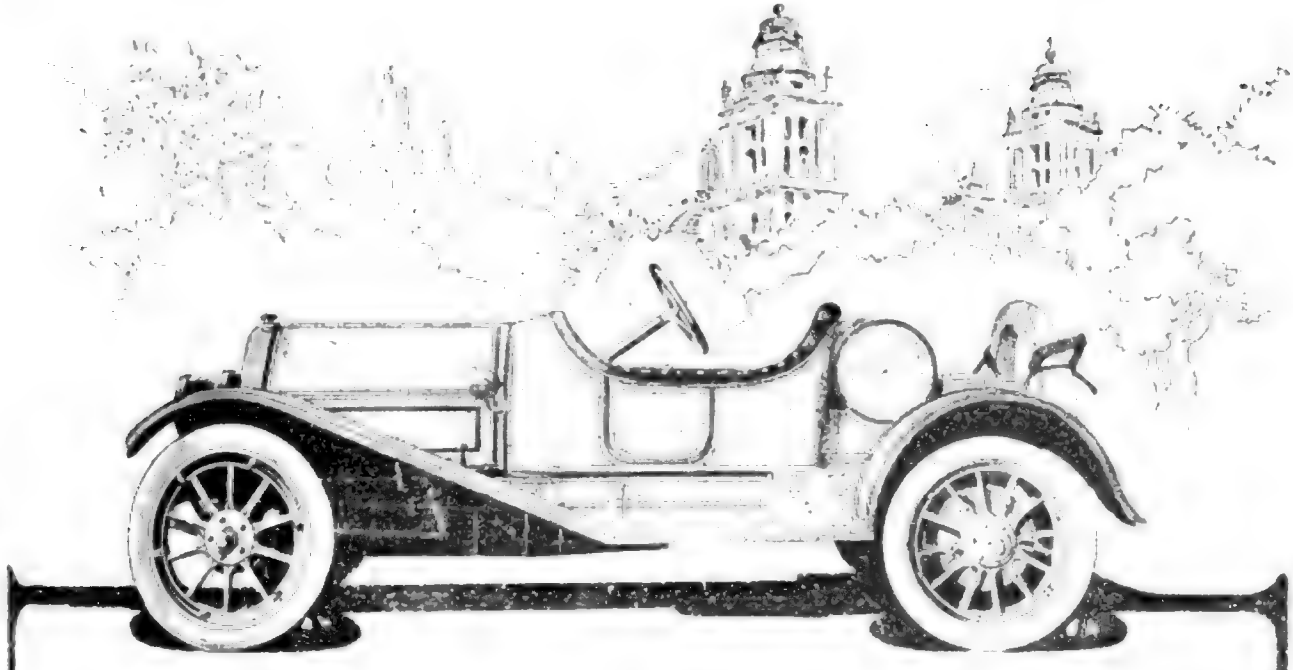
For 1913 three models stand out prominently, the Pullman 4-36; Pullman 4-44, and the Pullman 6-66. These models follow closely the lines and design of the previous year and but very little change has been made. This largely has been in the way of refinement and equipment.

All Pullman models, for example, are electric lighted and equipped with a dependable and well tried electric starter.

All radiators have been enlarged and the oil reservoir has been increased in size on the larger models. The fly wheel and clutch have also been enlarged as has the steering wheel on all models. The springs have been improved and strengthened on all models and where necessary have been lengthened.

From tire to top all models are thoroughly and completely equipped with every device and accessory that adds to the comfort and convenience of the car.

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BACK of every Pullman car stands ten years of experience that makes for the benefit and protection of the car purchaser. For ten years the Pullman Motor Car Company has sought to produce each year the greatest car value on the American market. Our long list of constant satisfied users and money making dealers is fair evidence of the realization of our plans.

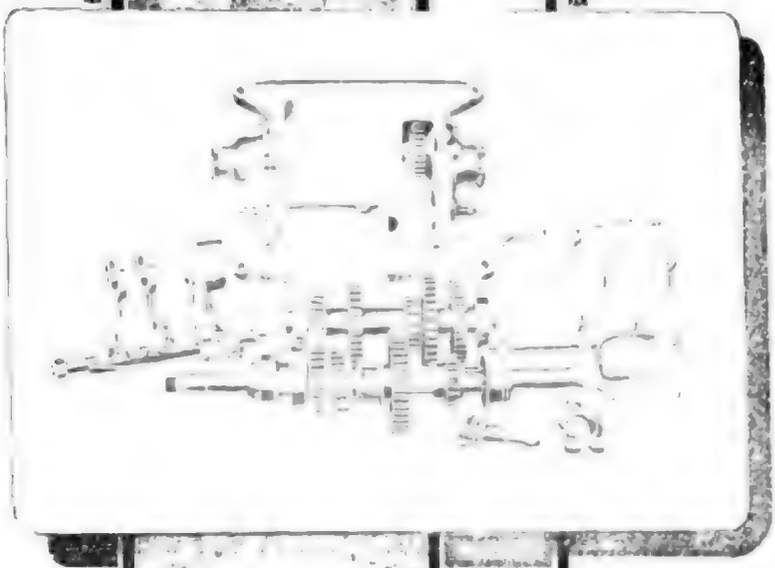
Consequently in our 1913 offering there is nothing of an experimental nature. Basic design and basic construction of all Pullman models has been proved right for several seasons and these correct basic principles have been closely adhered to.

The 4-36, $1675, is a popular five-passenger car of medium horsepower. The motor is 4 1-16 x 5 inches with cylinders cast in pairs and large valves. This same chassis, however, may be equipped with any one of six bodies.

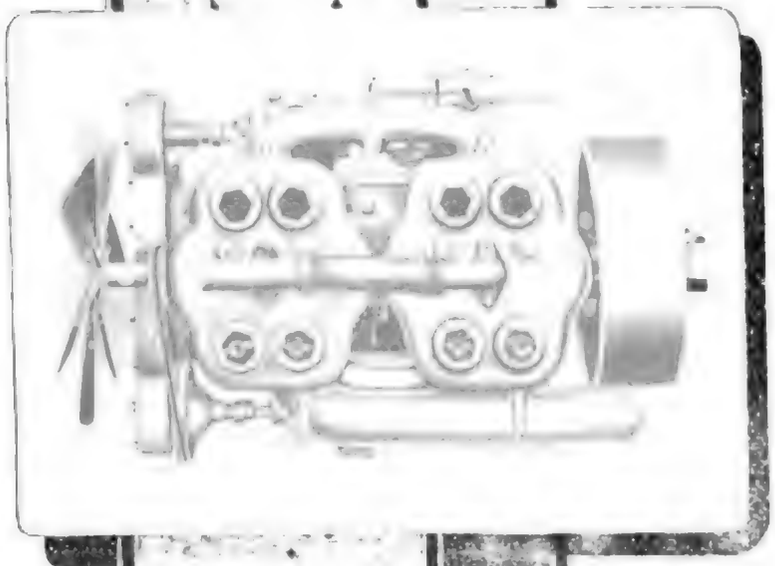
The 4-44, $2150, carries a 4½ x 5½ motor also with large valves. The transmission in this model is four-speed of very compact design. This same chassis may be had equipped with any one of six bodies.

The 6-66, $2750, is a big, powerful car with a 4½ x 5½ motor that develops its rated horsepower at only 1300 r. p. m. This model also carries the four-speed transmission and a wide range of body styles.

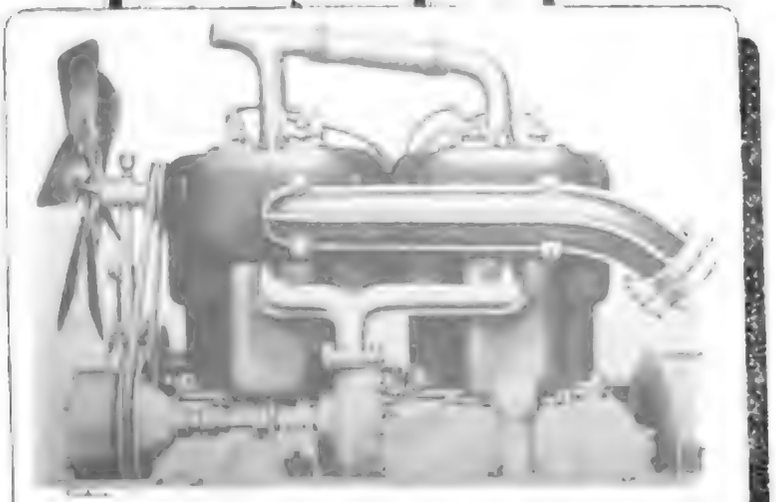
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THIS shows a dissembled Pullman four-speed transmission. The case is cast in one piece assuring rigidity, uniformity and extreme accuracy. The gears are large, which minimizes teeth pressure and insures perfect lubrication. These transmissions are run on a testing bench 20 hours, then taken down, inspected, cleaned and remounted before being finally assembled in the car.



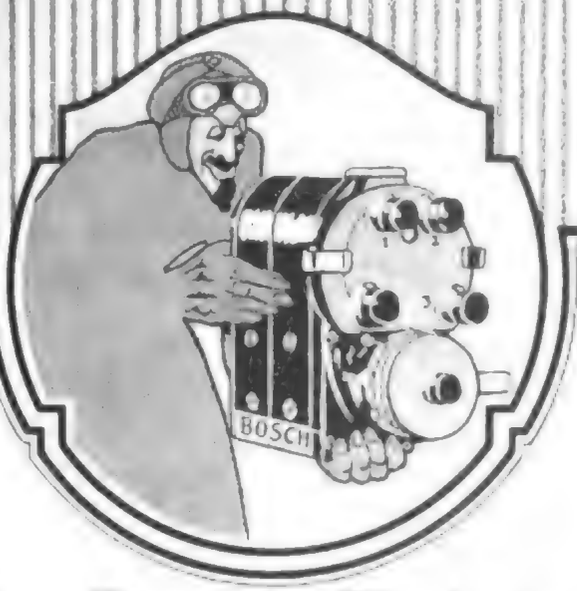
TOP view of a Pullman 4-44 motor. The cylinders of a Pullman motor give excellent example of the careful tests and inspections in the Pullman factory. After being carefully examined and put under water pressure test each cylinder is carefully annealed for ten hours to overcome internal strains. Then it is tested under pressure again and rough bored. They are then allowed to stand for ten days to take final shape before being finish bored.



EXHAUST side of the 4-44 motor. By placing the pump on this side and the magneto on the opposite side the stress on the shafts is more evenly divided. All valves are enclosed and operated by adjustable valve lifters. All bearings are extra large and all parts are very accessible.

THE PULLMAN MOTOR CAR CO.
YORK, PENNSYLVANIA

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No Bosch Exhibit

Insufficient space having been allotted, Bosch Products will not be exhibited at the 1913 Automobile Shows. The Bosch Exhibit will be at our Salesrooms.

BOSCH MAGNETO COMPANY, NEW YORK
DETROIT CHICAGO SAN FRANCISCO TORONTO

Overland

THREE thousand Overland dealers in the world's cities, towns and villages are dominating the local trade with the 1913 Overland.

Overland dealers are equipped with two impregnable values; they possess a car each side of the great automobile dividing line—***$1000.***

When you have examined, inspected and discussed the scores of new models at the National Automobile Shows, remember—

That in twenty-four hours after the first public announcement of the 1913 Overland, the demand was greater than our annual supply.

Literature on request. Please address Dept. 50.

The Willys-Overland Company

Toledo, Ohio

Overland

$985—Completely Equipped

Model 69-T

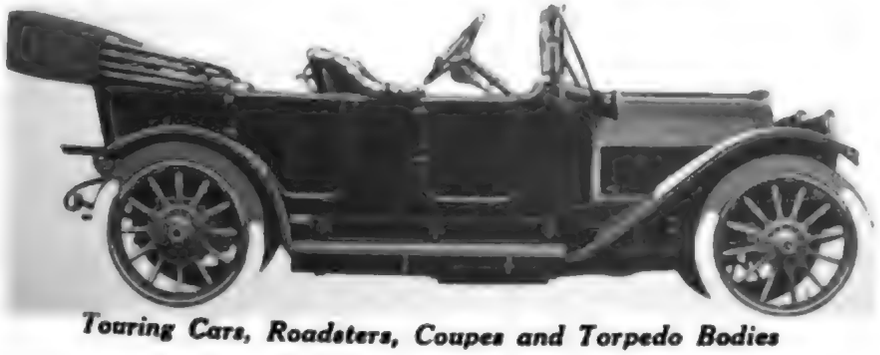
Self-starter
30 Horsepower
5-Passenger Touring Car
110-inch Wheel Base
Timken Bearings
Center Control
Remy Magneto
Warner Speedometer
Mohair Top and Boot
Clear Vision, Rain Vision
Wind Shield
Prest-O-Lite Tank



$1475—Completely Equipped

Model 71-T

Complete Electric Lighting Outfit, Generator and Storage Battery
Self-starter
45 Horsepower
Q. D. Demountable Rims
Timken Bearings
Center Control
Wheel Base 114 inches
Brewster Green Body, ivory striped, nickel plated and dead black trimming
Warner Speedometer
Mohair Top and Boot
Clear Vision, Rain Vision
Wind Shield
Prest-O-Lite Tank
Extra Rim



Touring Cars, Roadsters, Coupes and Torpedo Bodies

The WARD LEONARD Lighting and Starting System

WARD LEONARD

AUTOMATIC SYSTEMS CONTROL

Lighting - Starting

A BRILLIANT ACHIEVEMENT

From New Years to New Years, the constant brilliancy of the lights supplied by the Ward Leonard Lighting System, and the unfailing regularity of the Ward Leonard Starting System go on without supervision and with the admiration of the electrical world.

WARD LEONARD ELECTRIC CO.

BRONXVILLE, N. Y.



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Continental

A Motor That Confers Distinction on Every Car It Drives

A man speaks with pride of the Continental Motor in his car.

A manufacturer installs it, and advertises the fact.

Both are moved by the same impulse, and behind that impulse is the universal recognition of the Continental as a mark of high quality and distinction.

The Continental is so accepted because it long since has proved its right to the fullest confidence of the car owner and the car manufacturer.

Think of a car powered with a Continental Motor.

Recall what you have heard said about it, not only by men who own that particular make, but also by men who own others.

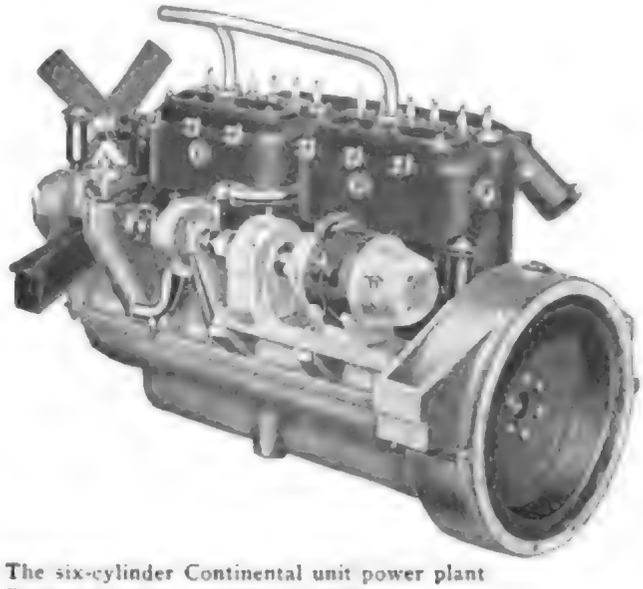
Recollection will tell you that the car's reputation is high—it is regarded as a good car.

This idea, as we have said, is widespread.

A Continental Motor is looked upon as standing sponsor for the quality of the car.

We want you to get acquainted with the Continental—whether you are owner, engineer or manufacturer.

It will not be troublesome to do this, for at both the New York and Chicago shows many of the leading pleasure cars and trucks will be equipped with the Continental



The six-cylinder Continental unit power plant
Bore, 4⅛ inches; stroke, 5¼ inches.
Built to accommodate any type of self-starter now made.
Simple method of mounting shown in illustration.
Suitable for right or left hand drive.
Four cylinder types—20 to 70 H. P.

Note, also, the large percentage and class of these cars; this will be impressive testimony.

Specifications, literature, etc., mailed on request.

CONTINENTAL MOTOR MFG. COMPANY, Detroit, Mich.

FACTORY REPRESENTATIVE: K. F. Peterson, 1225 Michigan Blvd., Chicago, Ill.

Chicago Show Exhibit, February 1-8, Space 56, Coliseum Gallery

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$850—$900

5 models:

Five models—at $850 and $900—afford equipment to suit every preference. Top with side curtains and dust cover; windshield; kits; lamps; generator; horn and jack—with $850 model. In addition—Speedometer; Prest-O-Lite or electric outfit; quick demountable detachable rims; tire irons, etc., with all $900 models.

Nine of the Big Features

1. Ball bearing throughout.
2. Long stroke, high power motor, unit power plant fully enclosed.
3. Full floating rear axle.
4. Left hand drive, center control.
5. Extraordinary braking surface.
6. Multiple disc clutch, running in oil.
7. Extra capacity tubular radiator.
8. Enclosed valves, all on one side.
9. Platform rear spring.

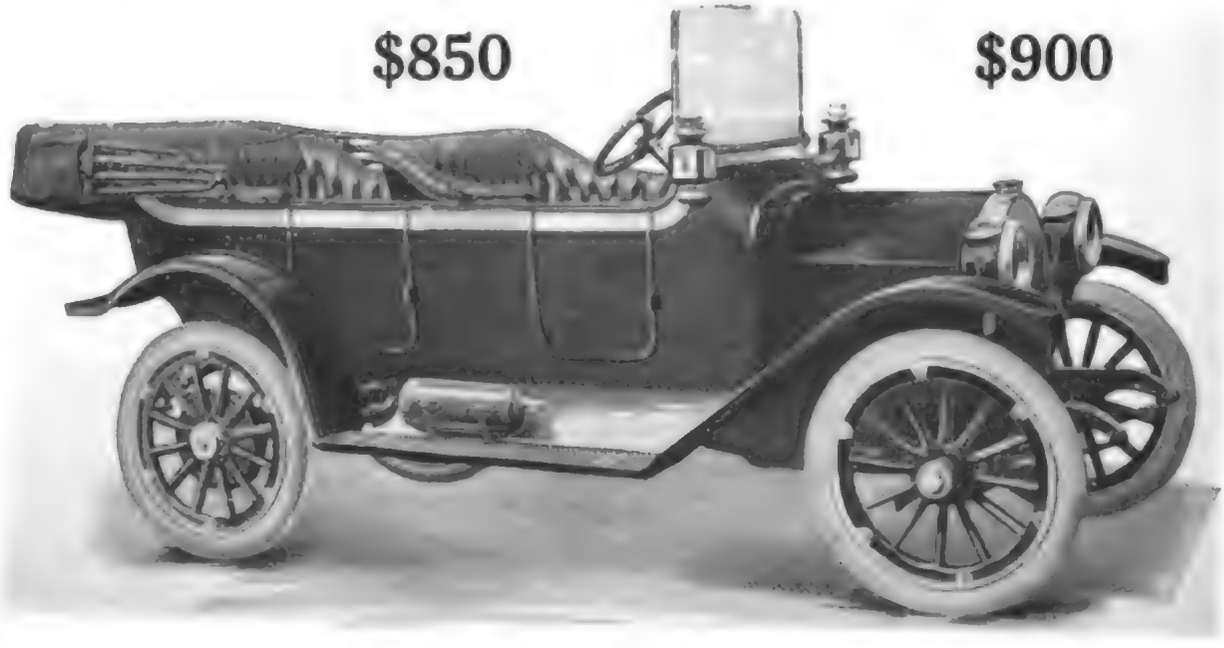
Detroiter

As Notable in Economy as in Cost

Right as the first cost of the Detroiter is—the low after-cost is even a bigger point in its favor. The same nine exclusive features of construction that make this car distinctive in the low-priced field, make it also a marvel of low upkeep. From 20 to 25 miles on a gallon of fuel, and 75 miles on a quart of lubricant is its every day record. Note the superior points of construction in the panel at the left.

The combination of these three—the nine remarkable features of construction, the remarkable first cost and the remarkable after-cost—is the reason why the Detroiter is probably the easiest selling car in America today.

$850 $900



Briggs-Detroiter Company

449 Holbrook Avenue DETROIT

Principal Distributors for the U. S.

BALTIMORE, MD.
Detroiter-Baltimore Company
BOSTON, MASS.
Andrews-Dykeman Company
CHICAGO, ILL.
Illinois Automobile Company
DETROIT, MICH.
Barber Motor Sales Company
FORT WORTH, TEX.
J. R. Overstreet
INDIANAPOLIS, IND.
E. M. Holmes
JACKSONVILLE, FLA.
Dixie-Detroiter Company
KANSAS CITY, MO.
Southwest Motor Company
LOS ANGELES, CAL.
Y. R. Del Valle
LOUISVILLE, KY.
Inter-State Motor Car Co.
MILWAUKEE, WIS.
Oakland-Wisconsin Motor Company
MINNEAPOLIS, MINN.
Brice Auto Company
NEW YORK CITY
K. C. Pardee
OMAHA, NEB.
T. G. Northwall Company
PHILADELPHIA, PA.
Detroiter-Philadelphia Company.
PORTLAND, MAINE
Spear Auto Company
PORTLAND, ORE.
H. L. Keats Auto Company
ROCHESTER, N. Y.
F. R. Loescher, Inc.
ST. LOUIS, MO.
Brown Automobile Company
SAN FRANCISCO, CAL.
Carl Christensen
SHREVEPORT, LA.
Wray-Dickinson Sales & Garage Co.
WEBSTER, S. D.
South Dakota Motor Car Company

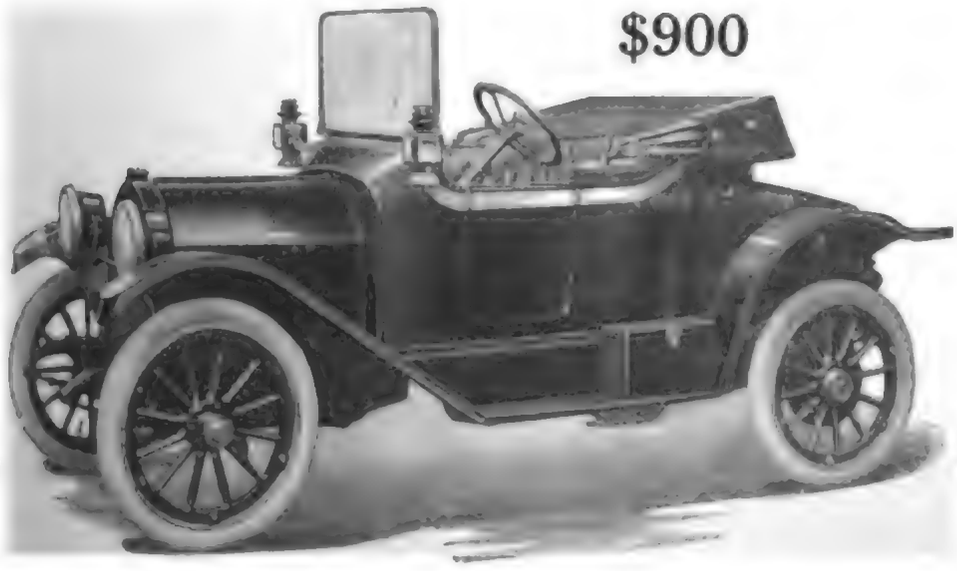
Detroiter

One of the Handsomest of Cars at Any Price

The Detroiter is represented by a list of the best distributors in the country, supplemented by over 500 live agents. The policy of the Briggs-Detroiter Company is fair and square. The car itself was the sensation of last year's Shows—and will be of this year's. What territory remains will go with a rush and the keen dealers—keen enough to decide quickly—will take it.

All five models will be on display at 120B, Palace Show, New York

$900



Write for Catalog and Dealers' Proposition

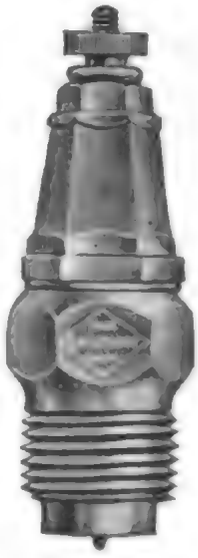
Briggs-Detroiter Company

449 Holbrook Avenue **DETROIT**

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SPLITDORF

"Always There"

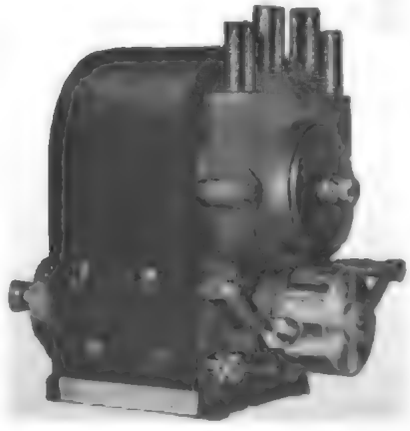


SPLITDORF ignition devices are making rapid headway in the choice of owners and drivers of the automobile, the motor truck, the motor boat, the motorcycle, the aeroplane and the motor driven farm implement. Sheer merit has brought them to the front in the face of the closest competition.

SPLITDORF PLUGS are not experimental—they are STANDARD. Known since their first appearance as the "common sense plug," they are exactly that—no more and no less. SPLITDORF PLUGS will outlast your motor. There is nothing fanciful about them—they are made to endure any and every strain of ignition put upon them.

Four magnetos of the well-known SPLITDORF low tension type are making their appearance for the first time, minor structural changes on the older styles giving the latest models a smoother and more compact appearance. Models "W" and "Z" are of the 3-pair magnet type, designed for heavy, low speed 4 and 6 cylinder motors respectively, while the "X" and "Y" are of the 2-pair magnet type for 4 and 6-cylinder motors respectively, in which efficiency has been raised to the highest standard.

If interested in any form of ignition for gasoline motors, just write in for our free literature. Our new catalog, our "Racing Record" or our "New Lights for Old" is yours for the asking. Do it TODAY.



Splitdorf Electrical Co.

98 Warren Street
NEWARK, N. J.

BRANCHES

NEW YORK.....18-20 West 63rd Street
BOSTON.....180-82 Massachusetts Avenue
PHILADELPHIA.....Juniper and Cherry Streets
CHICAGO.....1110 S. Michigan Avenue
DETROIT.....368 Woodward Avenue
KANSAS CITY.....1823 Grand Avenue
SEATTLE.....1628 Broadway
LOS ANGELES.....1226 South Olive Street
SAN FRANCISCO.....430-36 Van Ness Avenue

LONDON BUENOS AIRES

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PROFITS

The goods you want to handle, Mr. Jobber, are those which make you money



This illustration in your catalog will bring you more business than any other article you carry.

The START-LITE Junior Gas Lighter is widely advertised, well known, and absolutely satisfactory.

The START-LITE Junior Gas Lighter is guaranteed on a "Money Back" basis.

The START-LITE Junior Gas Lighter is the first lighter embodying the two essential features to the success of a device of this kind

POSITIVE PRESSURE REDUCTION—
SINGLE OPERATION

THE START-LITE COMPANY
1502-B Michigan Ave. Chicago

TEAR THIS OFF AND MAIL IT.
Send us your complete jobbing proposition on above without obligation.
Name.....
Address.....
Buyer.....

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TELEPHONE CONNECTIONS
DR. O. G. FREYERMUTH
PHYSICIAN AND SURGEON
1120 GUERRERO STREET

SAN FRANCISCO, October 21, 1912.

The START -LITE Company,
1502 Michigan Ave.,
Chicago, Ill.

Gentlemen:

Replying to yours of July 3rd, I will answer the questions as follows:

The appealing feature of your system was its reasonable cost and the economy of operation, for the acetylene bill is reduced over one half, as when the lights are not needed they are instantly put out.

I have had my equipment now five months and can say that it is a pleasure to have the lighting control at my finger tips. I am more than pleased with it.

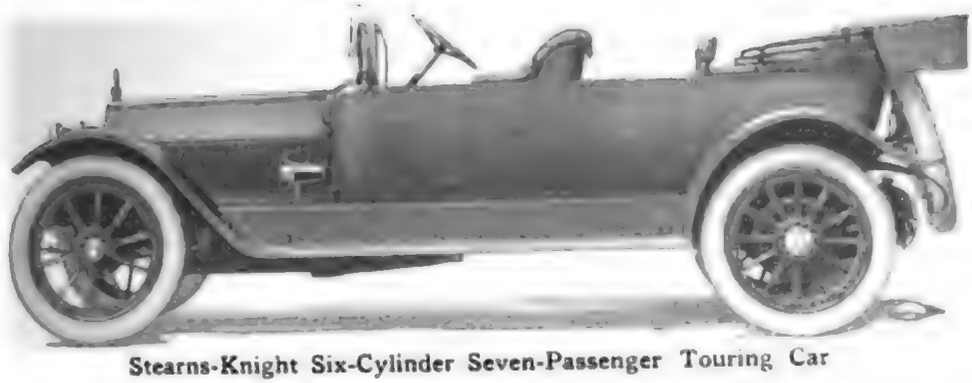
I preferred this system to the electric system because it was cheaper to install, cheaper to operate, more reliable and the light more effective.

I am

Yours very truly,

O G Freyermuth

Announcing the New Six-Cylinder STEARNS-KNIGHT



Stearns-Knight Six-Cylinder Seven-Passenger Touring Car

THE new six-cylinder Stearns-Knight is pre-eminently a class car—built for those who demand the utmost in motor car luxury. This of necessity means limited production, and emphasizes the importance of placing orders early if delivery is to be assured.

Chassis in Lead . . .	$4400 and $4500
Seven-Passenger Touring Car . .	5000
Five-Passenger Touring Car . . .	4850
Four-Passenger Light Touring Car .	4850
Three-Passenger Roadster . . .	4850
Limousine	6100
Landaulet	6200

All six-cylinder Stearns-Knight models are completely equipped with Gray & Davis electric starting and lighting system, Warner Autometer, Mea magneto, windshield, Klaxon and bulb horns, silk mohair top with side curtains and slip cover, Q. D. demountable rims (two extra rims), muffler cut-out, robe-rail, foot-rest, tire-carrier, complete tool and tire repair equipment, etc.

Stearns

THE ULTIMATE CAR
(Knight Type Motor)



THE F. B. STEARNS COMPANY

12963 Euclid Avenue

CLEVELAND, OHIO

Branches and Dealers in 125 Cities



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Choose Your Car *Now*

NOW is the time to decide what car you are going to buy. The automobile shows bring all of the cars before you. You have a chance to study them—to compare them point by point.

We do not expect you to buy a Chalmers car simply on our word that it is the best value at the money. You will want to see all the cars and to compare them as to quality and price.

Let Us Prove Chalmers

We believe, however, that Chalmers cars possess qualities that make them the best cars for you to buy. And all we ask is an opportunity to prove to you that the things we say about Chalmers cars are true.

They of course have all the "features" that modern motorists demand—self-starter, electric lights, long stroke motor, demountable rims, four-forward speed transmission, speedometer, power tire inflater, etc.

How to Judge Motor Cars

But in addition they have certain other ***qualities*** which you should look for in all the cars you consider.

As you study the cars at the National shows or in the dealer's salesrooms compare them not only as to comfort, beauty, convenience and mechanical excellence, but also as to the following points:

1. **Stability of the company marketing the car.**
2. **How long have they been in business?**
3. **Do they manufacture their parts or merely assemble?**
4. **What do the owners say about the car?**
5. **Has the car itself merely features or is real quality built into it?**
6. **Will it command a good price in case you care to sell it two or three seasons hence?**

Consider the prices of cars ***only in relation to their quality.*** You can pay too little to make a wise investment. You can also pay too much.

Here are some specific facts showing why it is to your interest to pay the Chalmers price rather than lower prices. These same facts show why it is not necessary to pay more than the Chalmers price to get the maximum in motor car service and comfort:

Chalmers transmission gears are ground to an accuracy of ½ of 1/1000 of an inch, at a cost of $8 more than unground gears. But grinding means quietness, smoothness, long wear.

The Chalmers crank shaft cost $6 more than a crank shaft which "would do." But one fact that we are proud of is that we have never had a case of broken crank shaft.

We spend an extra $15 on each Chalmers body in order to use the best material and the full flush-sided bell-backed design.

None Better than Chalmers

To make Chalmers radiators the best in use we spend $5 more per radiator than the ordinary type costs.

We could "save" $10 per car in top material alone but the costlier quality tells in longer wear and better looks. Would require a chemical analysis to tell the difference.

We could buy leather for upholstering $12 per car cheaper than we actually pay. We spend this difference to secure a high grade, genuine, long-lasting leather.

Compare Chalmers with Others

The Turkish springs in the luxurious Chalmers cushions cost $3.50 per car more than the ordinary spiral springs used in most medium priced cars.

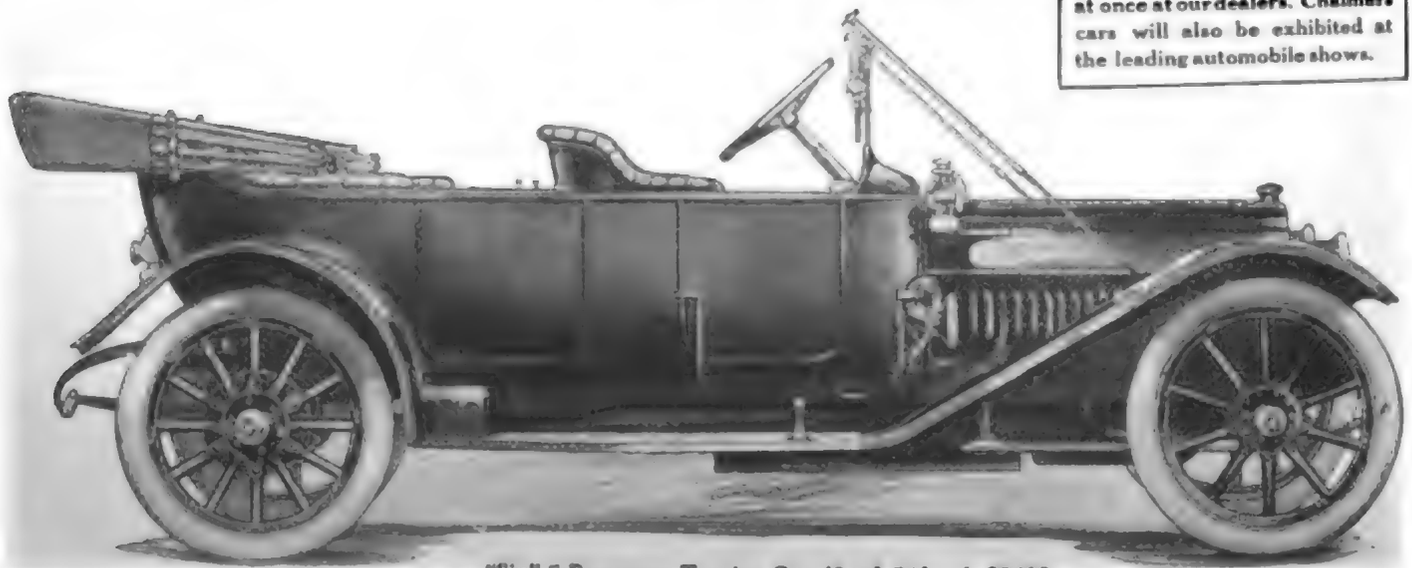
We mention these few items just to show you that we are making no exorbitant claims when we say that Chalmers cars are genuine quality cars at medium prices. We ask you to remember these things in making comparisons.

See the other cars, but do not buy until you have seen the Chalmers. Compare other cars in the Chalmers price class on the points we have named. We are willing to accept your decision after you have made such a comparison.

Our book "Story of the Chalmers Car" sent free on request, will help you in making your choice.

Chalmers Motor Company, Detroit

We urge you to see these cars at once at our dealers. Chalmers cars will also be exhibited at the leading automobile shows.



"Six" 5-Passenger Touring Car, (6 cyl. 54 h. p.) $2400

"Thirty-Six" (4 cyl. 36 h. p.) 4 or 5 Passenger $1950 **"Six" (6 cyl. 54 h. p.) 7 Passenger $2600** **"30" (4 cyl. 30 h. p.) 4 or 5 Passenger $1600**

(Prices include full equipment and are f. o. b. Detroit.)

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Marion

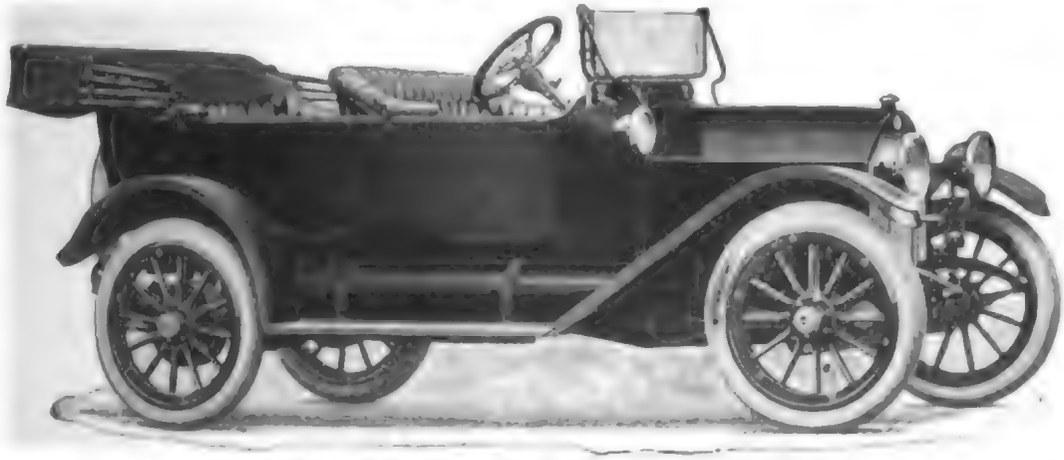
You Can Buy a Duplicate Of Any Marion Show Car

1913 Marion show cars are typical of the entire Marion product. You can purchase any Marion car on exhibition or get a duplicate of any model from any Marion dealer.

Every show in the 1913 circuit will have stock Marion cars, but in beauty of line and finish and in completeness of equipment, they equal any cars which are especially prepared for the show season.

This accords with the Marion policy of giving to purchasers and dealers the very best workmanship, attention and finish attainable. These cars are made in the largest automobile factory in Indianapolis, they have been built successfully for 10 years, and they are better now than ever.

Do not miss seeing Marion cars at the show—or see ones just like them in our dealers' show rooms. At New York they appear in the Grand Central Palace. In Chicago at 2450 Michigan Avenue.



Marion 37-A, Completely Equipped, $1475

1913 Marion cars are pre-eminent because of their graceful appearance, beautiful finish, class and luxury. They are powerful, sturdy and strong. The completeness of their equipment alone would make them notable.

There are four body models: 37-A, 30-40 h.p. five-passenger touring car, $1,475; 48-A, 48 h.p. five-passenger touring car, the Marion "de luxe," with electric self starter, $1,850; the famous Marion "Bobcat" speedster, 30-40 h.p., $1,425, and the latest Marion 38-A, 30-40 h.p. fore door roadster, $1,475.

These cars are built expressly for those who require reliability, comfort, style and full value for the money. Their position in the 1913 line-up is unique. For ten years they have been manufactured with unusual quality. In equipment they have no superiors. As to their standardization and success, there has never been a question. To produce and market the 1913 series, we have increased our capitalization one million dollars and have recruited experts from the oldest and biggest factories in the industry.

We cannot begin to enumerate all the points you will note and immediately like about the 1913 Marion. See them at the shows, or let us send you illustrated literature. We offer the fairest sales agreement ever written. If you are a dealer do not allow this opportunity to pass.

Big Features, Marion 37-A

Disco Self Starter.
Prest-O-Lite Tank.
Warner Speedometer
Nickled Trimmings
Tools, Tire Iron.
Center Control.
Dynamo Electric Lighting System.
Q. D. Demountable Rims, One Extra.
Mohair Top, Boot, Storm Curtains.
Brewster Green or Deep Wine Color.
Plate Glass Windshield.
Concealed Tool Boxes.
Ample Power.
Long Easy Springs.
Comfort, Dependability.
Quietness, Simplicity.
Deep Upholstering.
Plenty of Room.

THE MARION MOTOR CAR COMPANY, 918 Oliver Avenue, Indianapolis

J. I. HANDLEY, President

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CHICAGO ELECTRIC



The Chicago Electric

¶ The most advanced achievement in the electric pleasure car field.

¶ The big climax in the life experience of a great engineer. Mr. Frederick J. Newman has surpassed in the Chicago Electric all existing efforts to excel.

¶ Correspondence invited.

Chicago Electric Motor Car Co.

3606 South Morgan Street
Chicago

18

A Revolutionary Low Price

For the Most Efficient, Classic Electric!



$1885

The Standard Electrique

HERE IS AN electric pleasure car equipped with the ***same*** batteries, motor, control, frame, wheels, tires and make of body found in cars selling at $2,800 to $3,000.

THE STANDARD ELECTRIQUE is the only high-grade Electric built and sold for less than $2,000. The market for a car of this supreme quality and low cost is limitless. Thousands have waited for an opportunity to purchase an electric vehicle at a price which was not exorbitant.

LOOK INTO THE MERITS of this artistic and efficient car. The Standard chassis has at least thirteen points of constructional superiority over the high-price cars. The body design, by its grace and beauty, will instantly appeal to you.

AN INVESTIGATION will prove to you why we had an average of one new dealer every third day during 1912. Our production and sales for 1913 will set an Electric record.

See the Car Write Us Prove These Facts

Standard Electric Car Company

Factories—Jackson, Michigan

(17)



Cole "50" four cylinder, five passenger convertible to seven passenger, touring car, Delco electric self-cranking, ***price, completely equipped, $1985***

WOULDN'T you feel that as a dealer you were a success if you had this car on your floor?

Wouldn't it mean more than mere dollars and cents to you to represent a car which is writing gasoline history?

Just think what it would mean to you to have the entire magnificent Cole organization at your back to a man!

There is a way — the page opposite tells you how.

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You know—

that from this minute on automobiles will be *sold*, not *bought*. This means that in your fight for business you must be fortified with the best possible connection.

There are all kinds of motor cars—most of them are good. We admit it. On the other hand, you will admit that it's mighty hard to find any one line which offers you all the advantages, that you, as a dealer, have a right to demand.

Time and again you have said: "When I make my next change I propose to 'get in' right. Give me an organization which will take me into the family—I'm done talking through any factory's keyhole.

"First of all, give me *standard* construction, so that my time and the time of my salesmen won't be wasted trying to convince people that things which are wrong are right.

"I will not even consider any line that does not give me a a real proven self-starter—*it must be electric* and combined with electric lighting and ignition—such as the Delco. No more gravity feeds for me, either—give me a pressure feed with service tank in the rear. Give me three-point suspension, unit power plant, enclosed valves, a silent motor that *is* silent, automatic lubrication, long wheel base and elliptic springs in the rear. Put everything the driver needs to touch right on the dash, within her or his easy reach—where it belongs.

"And, I'm through with stingy upholstering—give me real, hand-buffed leather and upholstering at least eleven inches deep. This means that when Mrs. Smith sits down in my car—she's sold. And, by the way, Mrs. Smith, and every other prospect, is through being cramped for room. Give me a tonneau with plenty of sprawl room, and a safe, clean running board not cluttered up with traps. No cheap materials, either. Don't think I'm trying to tell you how to build your car, but if you'll give me this line-up, I'll put it over."

All right, Mr. Dealer, we've listened to you—now won't you listen to us? It's to your advantage. We actually have combined everything you specify in the Series Eight

COLE

THREE CHASSIS—THREE PRICES

No difference in quality—merely diamonds of varying karat

Cole "40", 116-inch wheel base, Delco Electric Starter, completely equipped...	$1685
Cole "50", 122-inch wheel base, Delco Electric Starter, completely equipped...	$1985
The new Cole six-cylinder "60", 132-inch wheel base, Delco Electric Starter, completely equipped.....	$2485

With this line-up you need never let a live prospect get away.

Hook up with COLE

Opportunity knocks but once—and she wears thick mittens. Maybe this is your chance. There's still some good territory open. Possibly you're located right in it.

Fill out the coupon opposite. It will cost you no effort—It may make you money. After you get the Cole Blue Book and the Series Eight Technical Bulletin—conceded to be the most comprehensive description of a motor car ever written—you'll be in postion to judge for yourself.

The live dealer is the dealer who does the right thing at the ripe time. We're expecting your coupon by return mail.

THIS IS YOUR COUPON—FILL IT OUT *NOW*

COLE MOTOR CAR CO., INDIANAPOLIS, INDIANA

I am one of those dealers who never believes in overlooking a prospect. Maybe we won't get together, but let's get down to cases. I would like to know more of your proposition and if my territory is open. Understand, this request carries with it no obligation on my part. Come on with your COLE BLUE BOOK and your SERIES EIGHT TECHNICAL BULLETIN—I am ready to look them over.

Name _____

Address _____

COLE MOTOR CAR CO.
INDIANAPOLIS

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Right Here is a Crucial Point of Your Car

The front axle of your car must not give way.

It's the part that protects your life and the lives of your friends.

Head on, it meets all the shocks from rough roads and withstands the constant vibration.

Human safety demands the utmost in good axle and bearing construction.

TIMKEN
AXLES & BEARINGS
ARE MEETING THE TEST

They are found at the front of a majority of the leading makes of motor cars—pleasure and commercial.

Doing valiant service. Protecting thousands of lives.

Giving comfort and satisfaction in driving.

Why Timken Axles and Bearings are Meeting the Test

Timken-Detroit Axles are made by an organization of men absolutely, and wholly devoted to *one idea*—good axle building.

Men who work together—in unison—who have worked together for years—whose experience goes way back into the era of horse-drawn vehicles.

Men who built successful axles for the earliest motor cars—both pleasure and commercial.

Men who have added to their own the experience of all the thousands of users of Timken-Detroit Axles.

Men who make a special study of axle design in the light of all domestic and foreign practice.

Men who care so much for the reputation of Timken-Detroit Axles that they do not neglect the least element of design nor risk imperfection in the smallest part.

The integrity and ideals of such an organization are the best guarantee to the builder and owner of a motor car.

Materials, methods—the finished product are but the expression of that integrity and those ideals.

Timken Tapered Roller Bearings owe their superiority to the principles of their design.

They are correct in theory—proven in practice.

The ideal motor-car bearing must do four things:

1. *It must reduce friction loss to the minimum.* Timken Bearings do reduce it to a negligible quantity.

2. *It must carry the heaviest possible load in proportion to its size.* Timken Bearings do this because they carry the load on the *whole length* of rollers, instead of the points of balls.

3. *It must meet side pressure or end thrust.* The rollers in a Timken Bearing carry end thrust, too, along their whole length—because they are tapered and revolve at an angle to the shaft.

4. *It must be adjustable for wear.* The Timken Bearing is the one bearing that can be adjusted to take up the minute wear *without sacrificing any of its other accessories.*

You can get the whole story of axle and bearing importance and construction by writing to either address below for the "Timken Primer, T-3 "On the Care and Character of Bearings," and T-4 "On the Anatomy of Automobile Axles."

THE TIMKEN-DETROIT AXLE CO., DETROIT, MICH.
THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

HOFFECKER SPEEDOMETER

WALTHAM TIME PIECES

Hoffecker is to a Speedometer what Waltham is to a Timepiece.



HOFFECKER SPEEDOMETERS

A car of quality is only possible when its parts and accessories (made on the outside) are also embodiments of quality—you, as a dealer, know this—your customers know it—and the 1913 prospective buyer is car-wise.

The Hoffecker-Waltham combination ought to be standard equipment on the cars you sell, simply because they are mechanically perfect, sold within reason and advertised to owners and prospective buyers in a convincing, effective way.

Now, when you recommend the Hoffecker-Waltham combination to buyers—when you ask the car manufacturer to so equip—then you are taking *a real interest* in your patron—one he will appreciate because he knows the nation-wide reputation of these instruments from their self advertised prestige and through our intelligently placed advertising.

Hoffecker speedometers and Waltham time pieces are made in factories where materials are selected and mechanical intelligence is paid for without regard to cost. These instruments in their durability and accuracy represent highest cost of production. *This means quality.*



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WALTHAM
TIME PIECES

Your manufacturer, Mr. Dealer, can buy them at a most moderate cost—but he cannot buy more quality at *any* price. The reason is obvious.

Hoffecker speedometers and Waltham time pieces are not extravagently and wastefully advertised. Our advertising gets the attention of the biggest group of men who read, reason, advise and buy on substantial advertised claims and the cost to us is small. Your customer does not help pay our publicity bills through *quality subtracted* to meet tremendous advertising bills.

One of the double-page spreads, advertising these products, is shown here. These appear regularly in The Automobile, Motor Age and Motor, these three publications covering the motoring field with their enormous circulations. This is our best advertising—and yours.

Here is the whole story of manufacturing and advertising methods that will put the best instruments in the world on the cars you sell—if you investigate and then act. Your manufacturer will co-operate. It's to his interest also.

NEW YORK SHOW
Space No. 243
Madison Sq. Garden Balcony

CHICAGO SHOW
Space No. 159
Coliseum Annex, 2d Floor





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Dealers: It's Business Wisdom

For their sterling worth in service and accuracy—

For the prestige they lend to the car—

For their moderate prices which fit the ideas of the square manufacturer—

In the interests of prospective car owners—

Specify—Insist Upon

HOFFECKER SPEEDOMETERS

WALTHAM TIME PIECES

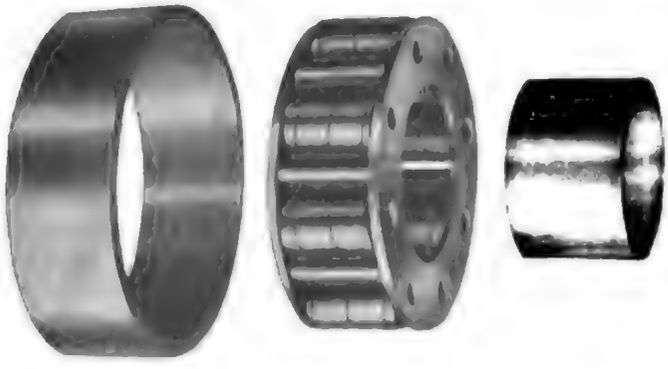


They Make a Good Car Better

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Hyatt Quiet Bearings



HYATT High Duty Type Bearings are best for transmissions because: They have never failed in transmission service. Once adopted for use in transmissions, they have never been replaced by any other make; they have, in many instances, replaced other bearings. They reduce noise. They possess superior lubricating qualities found in no other bearings. Their cushioning effect relieves gears and shafts of undue strains, reducing excessive and unnecessary wear.

High efficiency, first cost, dependability—each and all of which make bearing value—are not claimed as exclusive Hyatt features—but in practical value—the proper proportioning of all these factors and in ability to enable the Motor Car Builder to meet present conditions—the Hyatt Roller Bearing is claimed superior.

HYATT ROLLER BEARING CO.
DETROIT, MICHIGAN

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At the New

The Sensationa

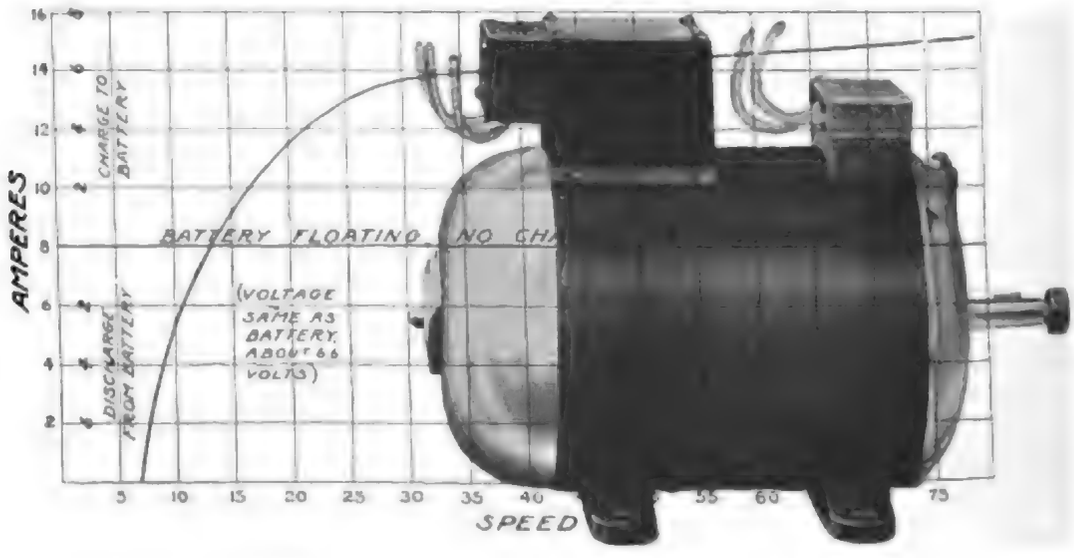
The Lighting and Startin

RUSHMORE LIGHTING DYNAMO

Complex Mechanism Eliminated

No solenoid regulator
No slipping clutch
No vibrating contacts

A ten-inch strand of wire (the ballast coil) performs all the functions heretofore dependent on complicated and delicate regulators.



No. 1 Dynamo and Output Curve

High output—16 to 18 amperes
Low weight; low cost

The most reliable variable-speed dynamo system ever invented, and declared by electrical engineers to be the true solution of the problem.

Get a full technical explanation of it at our exhibit. Space No. 224, west end of balcony, Madison Square Garden.

CHICAGO, ILL.
1330 Michigan Avenue

RUSHMORE DYNAM

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December 26, 1912

'ork Show!

ccesses of the Year
oblems Scientifically Solved

RUSHMORE ELECTRIC STARTER

Brand New! Press a Button—That's All!

No hand levers

No ratchet clutch

No friction clutch

No mechanism of any sort beyond the motor itself, its pinion and the flywheel gear!

Noiseless — Powerful
Instantaneous in Action

Pinion **automatically** engages flywheel gear, and **automatically** lets go the instant the engine perks up.

Cannot be damaged by careless manipulation—e. g., holding switch closed, or starting with advanced spark.

See this wonderful new starter at our exhibit, No. 224, west end of balcony, Madison Square Garden Show. Or you can see it on the Simplex, Mercer and Kline cars, both at their exhibits and on their demonstrating cars outside.

ORKS, Plainfield, N. J.

LONDON, 46 Brewer St., Piccadilly Circus W.
PARIS, - - - 116 Boulevard Pereire
BERLIN, - - W. 66 Mauerstrasse 66/68

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No adjustments—no moving parts—make

ZENITH

Carburetion standard carburetion

That the Zenith Carburetor and its principle of simplicity are successful is proved by its record in Europe, its birthplace.

There it has been in use for six years; and on some of the leading cars of the Continent.

At the recent Olympia Show in London, Zenith was the equipment of more than 29 per cent. of the cars displayed. Its closest competitor had a percentage of 13.

Zenith Sets Brooklands Record

At Brooklands recently a Zenith-equipped Vauxhall, four cylinders, 3½ x 4⅝, broke the track records set by a Sunbeam six-cylinder car, as follows:—

97.15 miles per hour in 50 laps; and one mile at a speed of 99.61 miles per hour.

Previous record: 93.75 miles per hour for 50 laps; 99.45 miles per hour for the mile.

We attribute the success of the Zenith entirely to its simplicity.

It has no moving parts but the float—not a spring, a ball or anything else.

It has not a single adjustment.

As it is made for a motor, so it remains forever—always supplying the correct mixture at high speed and low speed, under load and light, by means of its multiple jets.

To the manufacturer it is a standardized part. It is fitted in place; and there is no adjusting to do, no tuning up.

It requires no more attention in assembly or test than the finished cylinder block.

To the user, it is a boon. . . . its work perfectly under any condition and all conditions.

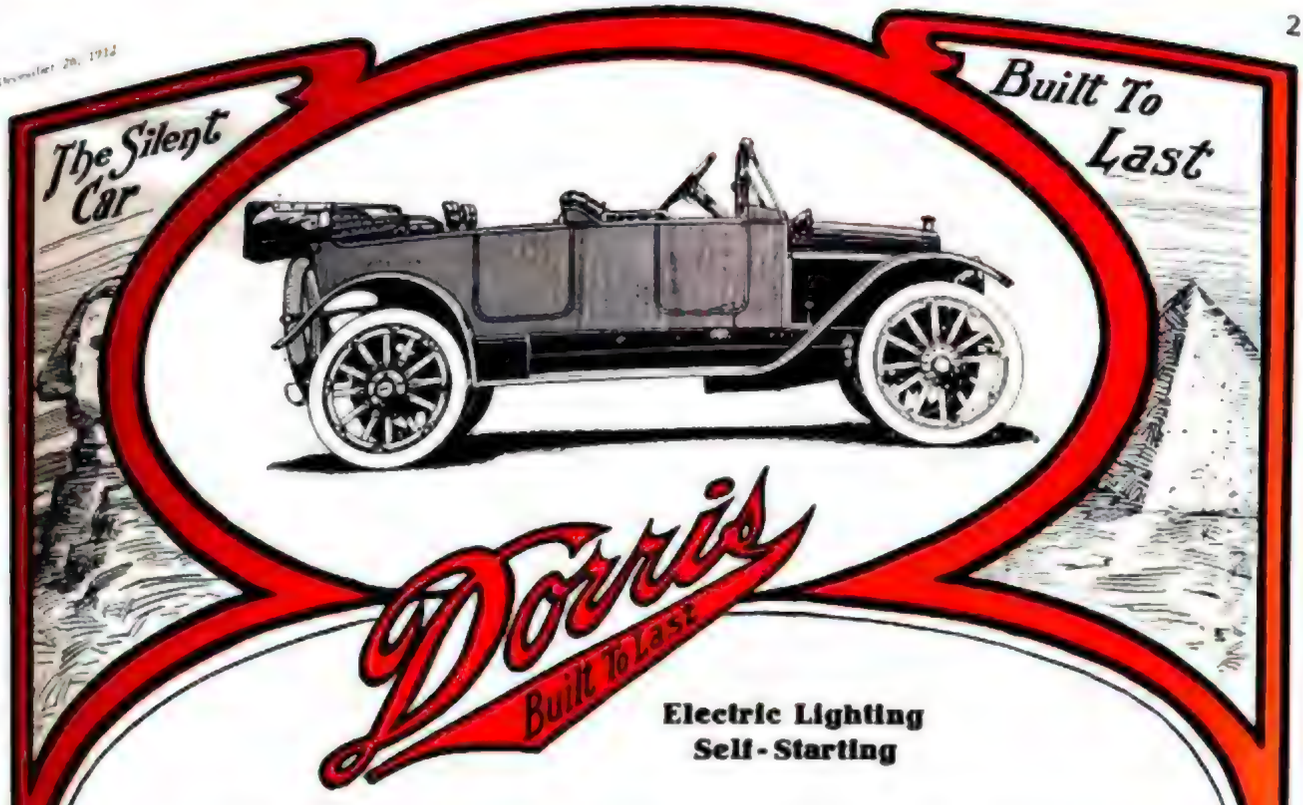
It is flexible to the last degree; economical, efficient; and for the first time it gives the word "automatic" its true meaning as applied to carburetors.

ZENITH CARBURETOR COMPANY, Detroit, Michigan

NEW YORK
Mercedes Repair Co.,
159 E. 54th St.

PHILADELPHIA
United States Motor Tire Co.,
818 N. Broad St.

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Electric Lighting
Self-Starting

On a solid foundation of make good quality and in-built power of performance, the Dorris is "Built to Last" in the truest sense of the word—

A car with the ruggedness and strength of construction to stand the hardest continuous service with minimum repairs—

And the modern refinements, luxurious ease of riding, and perfection of detail which give maximum comfort and satisfaction.

A car to out-live and displace anything else within hundreds of dollars of its price.

If you want a business that is "built to last"—a conservative, solid business that will grow steadily, surely and continuously, independent of passing fads and fancies, and indifferent to competition—then investigate the Dorris.

We manufacture a full line of Pleasure and Commercial cars.

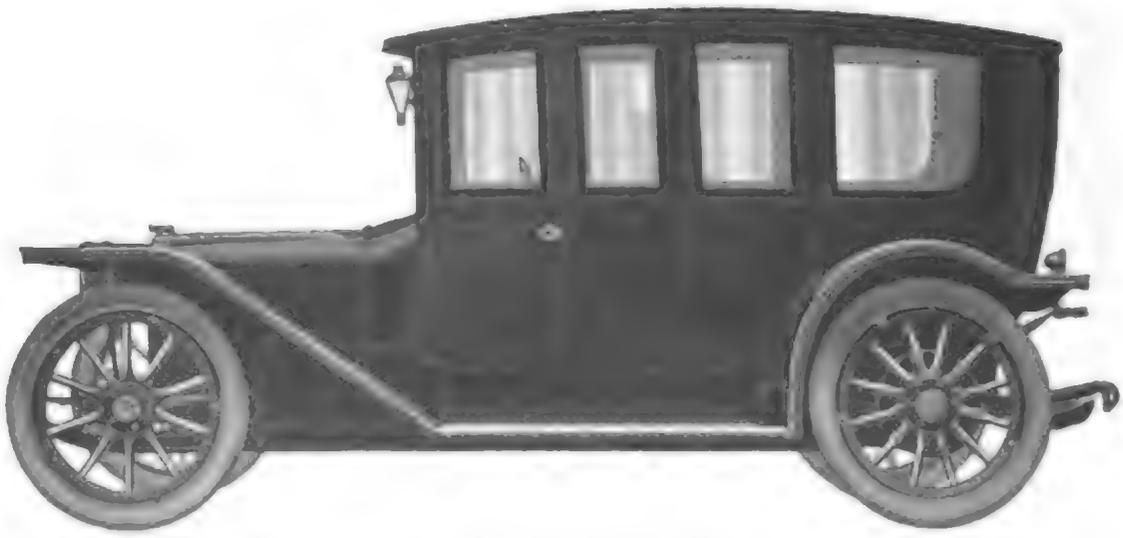
PLEASURE CARS	COMMERCIAL CAR CHASSIS
$2500 to $3600	**1500 Lb. Delivery Wagon, $2100**
Electrically Self-Started and Lighted	**¾ Ton Truck $2500**

We have the soundest proposition in the field today. You can't afford not to know about it whether we do business or not.

Write today.

DORRIS MOTOR CAR COMPANY, 100 S. Sarah St., St. Louis, Mo.

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Electrically Started

AMERICAN UNDERSLUNG

Electrically Lighted

A Convertible Limousine—Coupe

¶ The "American Tourist Limousine" is rapidly being adopted as a family closed car. A chauffeur may be dispensed with merely by dropping the glass partition at the back of the driver's seat. This unusual convenience means much to the prospective buyer of a closed car who does not wish to incur the expense of chauffeur hire.

¶ In the "American Tourist Limousine" our designers have incorporated as never before the sweeping, ease suggesting lines of the famous old Colonial coaches. "American Underslung" construction alone permitted this.

¶ The usual high overhung limousine must appear awkward and clumsy in comparison with this latest limousine type.

¶ The convertible limousine-coupe seats five with comfort—a fifth auxiliary seat fits into the upholstering. The interior is handsomely finished in the most expensive gray whipcord. The car is priced at $3500—complete.

¶ We will be glad to forward an artistically prepared booklet on closed cars.

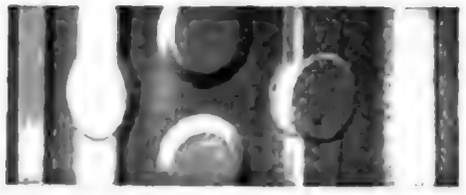
The "American Traveler Limousine"	-	*$6000*
The "American Scout Coupe"	- -	*$2000*

Please Address Department E

American Motors Company, Indianapolis, Indiana

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The HEAVY CAR TYPE Town Car Tread FISK TIRE



SECTION OF FISK TOWN CAR TREAD
Showing arrangement of rubber knobs and ridges. Note the clean-cut, substantial appearance.

COMPLETES a line which holds its peculiar place in the Tire Industry today.

The FISK HEAVY CAR TYPE construction is recognized by dealers and consumers as unusually strong and satisfactory—as remarkable in its mileage returns.

Fisk service to dealers and consumers is unrivaled. It is impossible for any manufacturer to have a greater interest in customers or to make a more sincere effort to see that every tire user gets the full value from every dollar that he spends for his equipment.

We have built and are building our business strictly on a quality basis. We are steadily and rapidly forging ahead in the one really legitimate way—solely on the merit of our product. It is the one safe policy on which to build and those dealers who are far-sighted are joining us in greater numbers every season.



CROSS SECTION OF FISK TOWN CAR TREAD TIRE
Showing inward construction not revealed in exterior view of complete casing. Note thickness of tread, reinforcement of side walls, arrangement of fabric, etc.

If you want to enjoy freedom from that bugbear ADJUSTMENTS you should sell Fisk Tires. Investigate the experience of Fisk dealers in that direction.

FISK HEAVY CAR TYPE Tires—Plain, Bailey and Town Car Tread—are made to fit any rim.

FIND OUT WHAT OUR PROPOSITION IS

Exhibiting at the Madison Square Garden Show



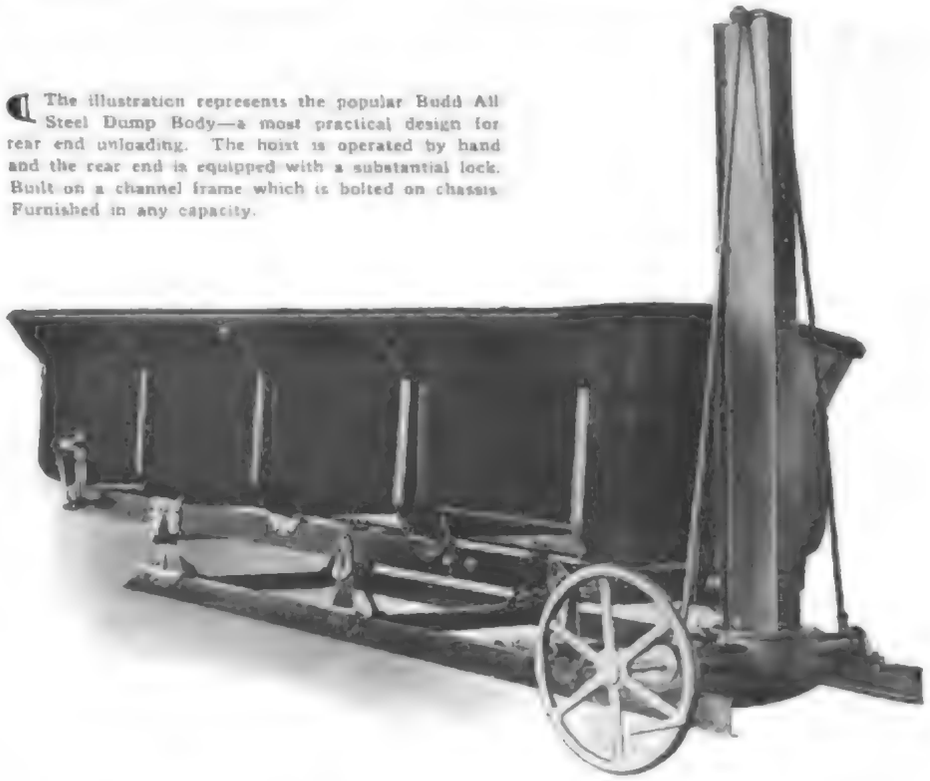
A Real Non-Skid Tire of True Fisk Quality.
Why Not Try One?

THE FISK RUBBER COMPANY

Department 23 **OF N. Y.** **Chicopee Falls, Mass.**

Branches in Forty Cities

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The illustration represents the popular Budd All Steel Dump Body—a most practical design for rear end unloading. The hoist is operated by hand and the rear end is equipped with a substantial lock. Built on a channel frame which is bolted on chassis. Furnished in any capacity.

Put an All Steel Body on *Your* Truck

Progress is marked by improvement. Evolution is the order of the day. Just as the motor truck is demonstrating its supremacy over the horse drawn vehicle so are Budd's All Steel vehicle bodies superceding the ordinary body of wood. The answer lies in two words—Proven Superiority.

The Budd All Steel Vehicle Body is a revelation in truck body building. Made of special open hearth steel and worked by the exclusive Budd process, innumerable designs in any style body are possible and the maximum of serviceability, stability and strength is assured.

BUDD All Steel Motor Vehicle BODIES

are practically indestructible. They are proof against the elements—immune from the ravages of time, wear and tear. They will not warp or crack. They cannot rot or split. Light in weight they are easy on tires.

By use of special machinery each body is worked into shape. All joints are carefully welded. Thus each body becomes a single unit—a perfect surface is assured which in turn guarantees the highest quality of "oven baked" enamel finish. A finish that practically becomes an integral portion of the steel and eliminates frequent repaintings.

From a sanitary standpoint alone, Budd All Steel Bodies demand your attention. All corners are made round. There is no chance for the accumulation of dirt. The steel will not absorb moisture, therefore perfect sanitation is possible.

When you stop to consider the fact that Budd's All Steel Bodies represent the height of efficiency in service and durability—that they give you every advantage of the wooden body yet none of its faults, and practically **cost no more than a first-class body of wood,** it is but justice to yourself that you give them a thorough investigation.

Whether you are a manufacturer of commercial vehicles or a prospective buyer of a motor truck, it will pay you to look into this matter now. We have some facts upon All Steel Bodies that will prove of vital interest to you. Write for them today.

We Will Exhibit at the New York Automobile Show

Edward G. Budd Manufacturing Company

ORIGINATORS OF THE ALL STEEL BODY FOR AUTOMOBILES AND COMMERCIAL VEHICLES

Ontario and I Streets D 4 **Philadelphia, Pa.**

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HAYNES

announces

Model 24, $1785

Electric Starting—Electric Lighting

AN EVENT which will interest every live dealer. With this new car—Haynes Standard throughout—added to our Model 22, the dealer has a complete proposition to meet every demand of his customers and need fear no competition.

This announcement is a fitting event with which to celebrate the twentieth anniversary of America's first successful automobile. It heralds a car that for design, quality and SERVICE will continue to keep the standard of Haynes Merit in the front rank where twenty years of effort have held it. An announcement that means many more Haynes owners, a broader field and increased sales for Haynes dealers.



HAYNES MODEL 24

NOW is the time of ALL TIMES to be a HAYNES dealer

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Here's the New Haynes—look at it—see what a car it is—figure out for yourself what this new price means in SALES



THIS new Haynes is marketed at a sensational price. Some big men in the industry have said it is a daring step for us to take, to "put a famous Haynes in the $1800 class."

Perhaps it is a daring step, but our factory efficiency and our increased production in the new plant *justify* this step. And if we are putting the Haynes in "the $1800 class" then this car marks the establishment of *new standards of value* among $1800 cars.

For Model 24 is *Haynes* standard. And Haynes standards are new to the $1800 class.

There's twenty years of motor car experience and standardization built into the Haynes, and you *cannot* supply your trade with such *certainty* of *service* in any other car.

Ever since that day two decades ago when Elwood Haynes gave his little horseless carriage—America's first automobile—its successful road test, the Haynes car has set the pace most of the time and *kept* the pace *all* the time.

Mr. Haynes never scored a greater achievement—aside from the production of his *first* car—than this new Haynes Model 24. The fact that we can offer this car at the sensational price of $1785—sensational for a Haynes—makes the achievement all the greater.

There are no better sales opportunities—from the dealer's viewpoint—than this new 1913 Haynes.



Left-Side Drive
Center Control
Luxurious Upholstery

The accompanying illustration gives just a hint of the luxurious upholstery which is but one of the many splendid features of Model 24. It also shows, in a degree at least, the roominess of both compartments and the especially convenient arrangement of Haynes center control.

This Big Haynes, Model 22, is continued as a Haynes Leader—a powerful, complete car and a popular seller with our dealers



WE ANNOUNCED the Complete Car—with *perfected* electric starting system—last July. This was Haynes Model 22. We said at that time that we had adopted the *type* of starter which was bound to become the standard starting construction on high-grade cars—the separate unit electrical system, embracing a dynamo for starting the motor, with gearing direct to fly-wheel, a generator and storage battery for lighting and standard magneto for ignition.

In the face of all the self-starter failures of the 1912 season this was a bold statement. But were we right?

Since that announcement, practically all high grade cars have adopted the separate unit system, the highest priced cars are using it, and automobile engineers everywhere declare it is now the *standard*.

The Haynes starting system is so simple in its wiring, so free from complications of every sort as to insure its constant operation.

Just another example of Haynes being *out in front*.

This big Model 22, full 40-horse power, marks the very highest development of the Haynes car. In New York, Chicago, San Francisco and other markets where competition is most keen and the car-buying public most discriminating, Model 22 has found great favor.

Model 22, Detail Specifications

Motor, 4½ in. x 5½ in., 40 h. p.; wheel base 120 in.; fine hair upholstery, 12 in. deep; tires 36x4½ in.; absolutely 100% efficient electric starting equipment of utmost simplicity; Eisemann dual magneto, Stromberg carburetor, Warner autometer, demountable rims, top, windshield, electric signal horn, electric cowl lamp, standard bumper, etc., etc. Touring car models $2250; Roadster $2250; Coupe $2750; Limousine $3400; Berlin $3500; f. o. b. factory.

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You Want the Haynes Now Even More Than You Ever Wanted It Before. And You Need It Now

Many dealers have built up splendid, permanently established businesses with America's pioneer car. And think how much greater the Haynes Line is today than ever before, with this new model at less than $1800 added to our present Model 22.

You must recognize how much Haynes *character*, Haynes history and Haynes high standard of construction mean as a *guarantee* of motor car service. The Haynes car is an *institution*,—always a known quantity in its *efficiency*. The twenty years' experience that is built into every Haynes means more to the discriminating purchaser than all loud-sounding claims could possibly mean.

Wouldn't you, as a dealer, build a profit on this foundation already laid? Wouldn't you find great satisfaction—and big business—as a distributor of America's *first* car and still its *foremost?*

And doesn't the addition of this new Haynes Model 24 to the splendid Haynes Line make it almost *imperative* —from your own viewpoint—that you should know *all* about the Haynes, and all about Model 24 especially, *at once?*

If your territory is still open, this is the car you want

Write or wire us today. Don't put the matter off to "think it over." Someone else will get into action while you are thinking. If you want this car, *act*. There is no better proposition for 1913. Write or wire today.

Haynes Automobile Company

499 Union Street, Kokomo, Indiana



All-Year-Around Service

TO GET full value from your motor car, you should select one which is **suitable for all-the-year-round service.**

Abbott-Detroit automobiles are.

In the first place, they are **driven by powerful** Continental motors which have **sufficient reserve** power to meet all emergencies.

By applying the power from the fly wheel the wheels in an equally efficient mechanical manner. Practically no power is lost.

THE CLUTCH

The clutch which is of dry, multiple disc type is composed of 17 steel discs, each alternate one faced with a combination of copper wire mesh and asbestos which will not burn.



Diagram of Clutch Construction Showing How the Cloth Faced Discs Engage

When this clutch is operated, there is a **total absence of all gripping, jarring and jumping,** the motor taking hold gradually but firmly.

Owing to the **large amount of friction surface,** this clutch is very efficient and **may be slipped without harm or excessive wear.**

Those who have driven cars through heavy mud and winter snow know how valuable is this ability.

Another thing on the cone clutch, the revolving parts attached to the transmission is so large as to keep the inertia of such a mass of metal enough to keep the clutch in motion and renders it almost impossible to shift the gears readily, without producing that clashing and rasping noise so disagreeable to the occupant of the car and others nearby.



Transmission and Clutch Case with Transmission Cover off

In the multiple disc clutch, however, this inertia is reduced to a minimum and the gears may be shifted while the speed of the car is being reduced or accelerated, without the attendant disagreeable and detersurating effects.

It wears very little and seldom requires adjustment.

Abbott-Detroit advertising for 1913 is being printed in serial form. This is the sixth of the series. The seventh will appear in Saturday Evening Post January 18, 1913, Collier's Weekly January 11, Life January 9, Literary Digest January 4. Copies of previous advertisements sent on request.

THE TRANSMISSION

The transmission, which is of the three speed forward and reverse sliding gear type, is situated just behind the clutch and its case is bolted direct to the engine crank case, so that the whole power plant forms one unit.

The main shaft and counter shaft gears, the faces of which are 1 inch in width, ¼ of an inch wider than those usually used in other cars of this class, are made of 3½ per cent nickel steel, very accurately machined, ground and mounted upon Timken roller bearings.

The transmission and clutch case is oil and dust proof and the gears and shafts run in a specially prepared lubricating compound.

If desired, the interior of the transmission case may be easily inspected, by the removal of the top cover plate.

The Abbott-Detroit transmission is one of the most compact and efficient change speed gears that has ever been placed in a motor car.

It has been **built for severe service** and for that reason will be found to be particularly adapted for hard winter use, when, on account of the changing character of the road it is necessary to shift gears often.

Abbott-Detroit

Built for Permanence and Guaranteed for Life

OTHER MODELS

Some other things should be mentioned as important for your consideration when buying a car which you expect to drive the year round.

There should be ample road clearance, an absence of projecting parts below the frame, a protected steering gear, wide flaring fenders, snug fitted to the body so that no water or slush can get through, provision for entirely enclosing all moving parts including brakes, well finished and upholstered bodies, close fitting wind shields and tops equipped with Jiffy Curtains, well fitted doors of clean cut design, free from places in which mud and slush can collect.



Rear Axle with Cover removed from Differential Case. Note also Underslung ¾ Elliptic semi Springs

Abbott-Detroit cars are admirably suited to give all the year-round service.

Remember — Electric Self-Starter
Electric Lighting
Standard Equipment
on all Models

"The demand of the day is that an organization shall be judged by its product and not by what is claimed for itself."

This is our slogan. Apply it when inspecting the 1913 Abbott-Detroit Cars.

MODELS AND PRICES

44-40	Fore Door Roadster, 116-inch wheel base	$1700
34-40	5-Passenger, Fore-Door Touring Car, 116-inch wheel base	$1700
44-50	5-Passenger, Fore Door Demi-Tonneau, 121-inch wheel base	$1975
44-50	7-Passenger, Fore Door Touring Car, 121-inch wheel base	$2000
44-50	Battleship Roadster, 121-inch wheel base	$2150
44-50	7-Passenger, Fore Door Limousine, 121-inch wheel base	$3050

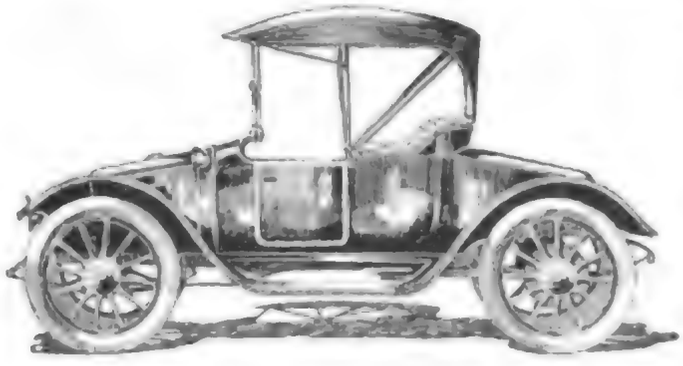
Advanced Catalog on request

ABBOTT MOTOR CO.
607 Waterloo Street, Detroit, Mich.

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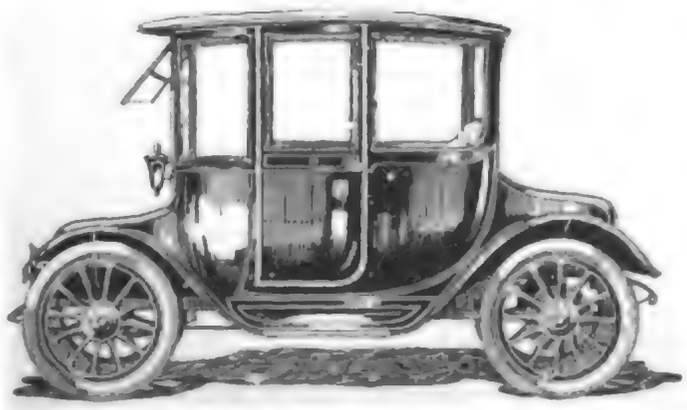
Mr. Dealer: The Borland is the Electric to satisfy the owner and profit the agent. Secure your territory now for 1913.

The secret of Borland superiority is *construction*. Mechanical perfection only can constitute an electric which does what the Borland does. For instance: *the run from Chicago to Milwaukee* (104 miles), under adverse conditions, on *one battery charge*, is conclusive evidence of the fact that the Borland owner gets plus-service on his battery equipment.



The Borland 1913 Roadster—It will be a great Business and Professional Men's car $2850

Specifications: General Electric motor, especially built for us to withstand a 500% overload. General Electric non-arcing controller with 6 speeds forward and 3 reverse. Interlocking device attached to brakes to cut off current when brakes are applied. Current is still cut off until Control Lever is returned to neutral position. Control lever horizontal type. Wheel base, 96 inches. **Batteries:** 42 cells, 11 plate Exide. **Speed:** 35 miles per hour. **Equipment:** Skid chains, hydrometer, odometer, pneumatic tires, 34 x 4.



The Borland 1913 Regular Coupe—A beautiful and elegant production $2900

Specifications: General Electric motor, especially built for us to withstand a 500% overload. General Electric non-arcing controller with 6 speeds forward and 3 reverse. Interlocking device attached to brakes to cut off current when brakes are applied. Current is still cut off until Control Lever is returned to neutral position. Control lever horizontal type. Wheel base, 96 inches. Extra large aluminum 5-passenger body, revolving front seats, either front or rear drive. **Batteries:** 40 cells, 9 plate Exide. **Speed:** 22 miles per hour. **Equipment:** Skid chains, hydrometer, odometer, toilet case and flower vase. Solid or pneumatic tires, optional, 34 x 4.

For appearance, satisfaction, comfort, safety, convenience and mileage the Borland is the most convincing electric known.

Our 1913 electrics recognize and cater to the advanced ideals and demands of the public.

These beautiful Borlands, 1913 models, will delight every woman who sees them and will sell themselves to the men.

The agent who sells a Borland to a man or woman is creating a continuing business for himself. The absolutely perfect construction of the Borland eliminates the necessity for repairs due to defective material or workmanship, and insures the dealer the greatest final profit on each sale.

With our increased factory facilities we have trebled our output, and are now in position to make very attractive propositions to dealers throughout the country.

Besides the models illustrated we are making: Brougham, $2500; Coupe, $2700, either front or rear drive; Limousine, $5500; 1500 pound delivery truck, open body, $2100; 1500 pound truck, with closed body, $2250. These models make a complete line for dealers to handle.

Write us today if you want territory. Better wire, for already the far-seeing dealers are negotiating for choice reservations. Catalogue and other literature sent immediately on request. Protect yourself and be the Borland man in your locality.

During the New York Show Mr. U. B. Grannis, Vice-President, will be at the Waldorf Hotel. Mr. Grannis will be pleased to talk with dealers who desire information regarding the Borland.

Our complete line of models will be demonstrated at the Chicago Show—Space A-1, First Regiment Armory.

The Borland-Grannis Co.

Salesrooms: 2638 Michigan Avenue, Chicago

Factory: E. Huron Street

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The One Certain Way To Obtain Tire Quality

USE

AJAX TIRES

Guaranteed for 5000 Miles

It's the easiest thing to claim Tire Quality
But We Guarantee It.

Ajax Tires mean—

—30 per cent more mileage than other standard tires at no greater cost

—5000 miles (written guarantee) vs. 3500 miles (verbal guarantee) a saving of from $4 to $20 on each tire

—Value and satisfaction that come with decreased tire cost and increased tire service.

Thousands of Motorists are Practising True Tire Economy. Are you?



Dealers Everywhere

have found the Ajax Proposition an unfailing trade winner. Our literature is an education in tire making and selling. Send for it today.

AJAX-GRIEB RUBBER COMPANY

General Offices: 1796 Broadway, New York City

Factory: Trenton, N. J. Branches in All Principal Cities

Safeguard Your Winter Motoring With AJAX Extra-Heavy Non-Skid Tire. The Only Non-Skid Guaranteed for 5000 Miles.

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Introducing a Device of Remarkable Merit



(FRONT VIEW)

THE BOYCE MOTOMETER

PAT'S PEND'G

Every sensible owner will buy—

Every live dealer will handle—

Buyers of new cars will request—

And the more progressive manufacturers, for 1913, will regularly equip with—THE MOTOMETER.

A watchlike instrument, fitted to any radiator cap, protecting the motor from damage caused by improper lubrication, overheating, defective cooling, etc.

The MOTOMETER is the only instrument ever invented to indicate, while driving, the **exac heat** of your motor, and in so doing warns you by means of a red fluid indicator,



(VIEW FROM SEAT ½ Actual Size)

When the Radiator Needs Water
When the Oil Supply Is Insufficient

In short it tells whatever excessive heat tells—a broken water pump, a clogged pipe, a broken fan belt, etc., and tells **before the damage is done.**

Attached the same as an ornament, readily visible from the seat day or night, the MOTOMETER registers the inside temperature of the radiator. It gives a feeling of security to know when the car is operating correctly—carburetor right, water right, lubrication right, everything right. Nothing can go wrong without the Motometer forewarning.

The constant rise and fall of the indicating fluid under varying road conditions, is more interesting and instructive to watch than a speed indicator. It will prevent frozen radiators in winter and cracked cylinders in summer.

And the Price Is

$10.

Finished in black enamel with gold plated or nickel rims. If your dealer cannot supply you, send check or money order and we will express an instrument prepaid. Sooner or later you will drive a Motometer equipped car. Why not enjoy it now.

DEALERS—The MOTOMETER is the handsomest and most meritorious accessory offered for 1913, selling at a price that means no dead stock. Act at once! Be the first to handle the MOTOMETER in your town.

THE MOTOMETER COMPANY, Inc., 904 U. S. Rubber Bldg. Broadway at 58th St. New York City

Exhibiting—Madison Square Garden—Space 540, Basement

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HAVERS SIX

The HAVERS "Six"
AT THE
New York Show.

HAVERS SIX

Of course you will read our announcement "that was withheld for three years" in Saturday Evening Post of January 4th. It will tell you what we have been doing in the past three years—what we are going to do in the future. It will also tell you that we will be at the New York Show. It is the first of a series of advertisements to appear in the Post and other periodicals and newspapers. For we want to drive home to the public the fact that ***this is the year of the Six and the Havers the Six of the year.***

We are going to exhibit our entire line of Havers Sixes at the New York Show, January 11-18. We will be on the mezzanine floor, Space 127,

GRAND CENTRAL PALACE

and cordially invite you to inspect these cars.

Whether you represent a six or not, we want you to make a careful, thorough investigation of both the finished car and the open chassis for the Havers Six will stand comparison with the most expensive automobile manufactured.

Beautiful in line, perfect in action, exquisite in appointment, it compels your very first consideration. For a thousand dollars less than you expect, it gives you everything that can be asked in six-cylinder luxury and service. Come and make us prove it.

To the worth while dealer who does not represent a Six, we extend a special invitation which may prove mutually profitable.

We have greatly increased our production by the purchase of the large E-M-F plant at Port Huron and in certain territory where we are not represented we have an attractive proposition. If you are not going to New York, write us today for particulars.

HAVERS MOTOR CAR CO.

1515 Elmwood Avenue

Port Huron,

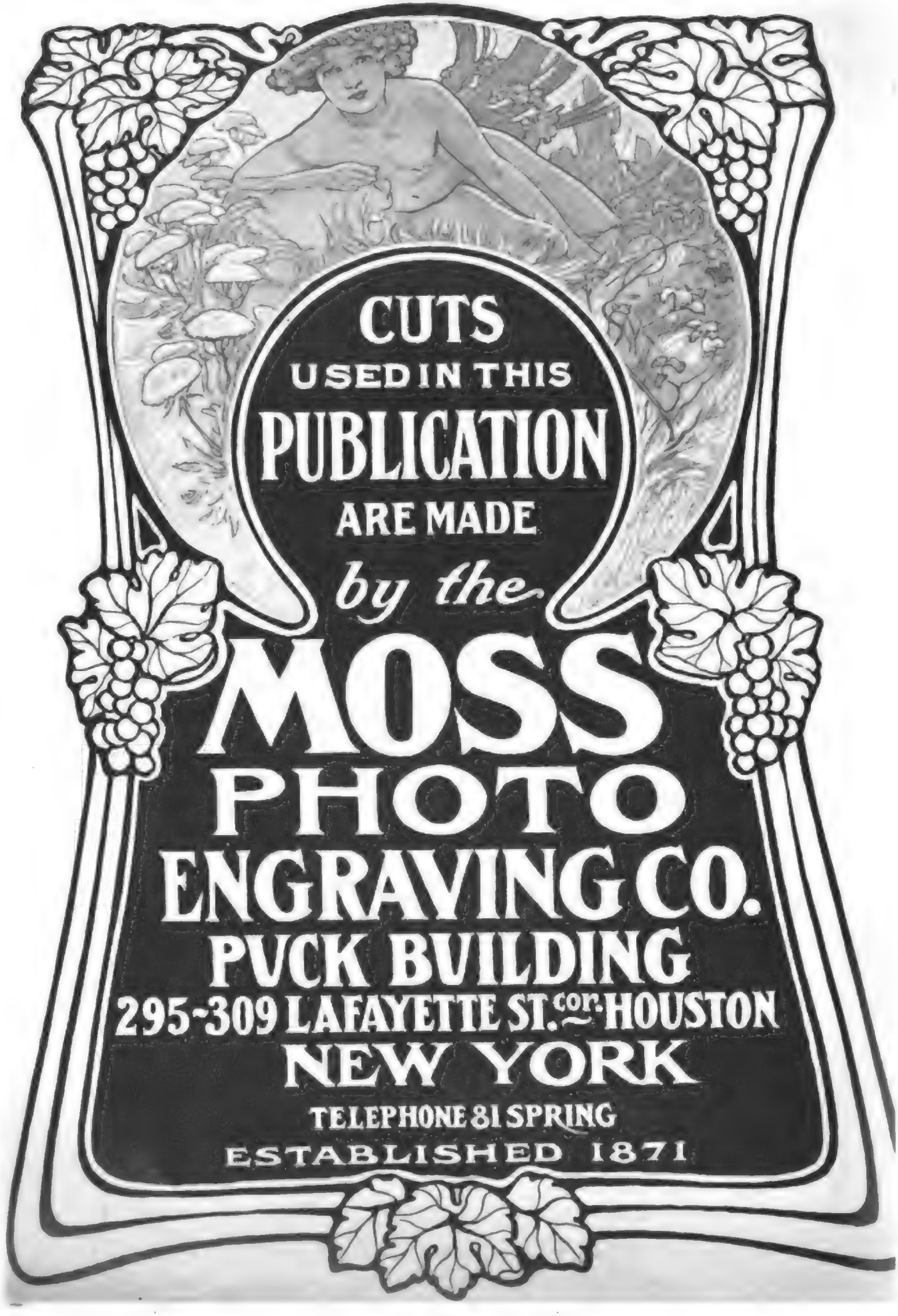
Mich.

HAVERS "SIX-55" Electric Lighting and Starting $2250

HAVERS "SIX-44" with Standard Equipment $1850



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CUTS
USED IN THIS
PUBLICATION
ARE MADE
by the
MOSS
PHOTO
ENGRAVING CO.
PUCK BUILDING
295-309 LAFAYETTE ST. cor. HOUSTON
NEW YORK
TELEPHONE 81 SPRING
ESTABLISHED 1871

Google

One Look Tells Everything

The JEFFERY-DEWITT CO. DETROIT, MICH. Visible Spark Plug lays bare all ignition troubles

The "visible gap" is an open "window" giving you a full view of the internal workings of your spark plug.

If the spark is seen jumping the gap, look for your trouble between the gap and sparking point.

If there is no spark in the gap, your trouble is behind the plug—in Magneto, or batteries, or coil, or wiring.

But for the "visible gap" it would take you many precious minutes—often hours—to locate the seat of trouble.



$1.00 Buys this great new Spark Plug

- Indicates in which direction trouble lies.
- Facilitates timing of engine.
- Intensifies spark in cylinders.
- Consumes only minimum current.
- Gap adjustable—can be closed entirely.
- By widening gap plug cleans itself.
- Permits regulating spark for any cylinder.
- Costs same as any good plug—$1.00.

Dealers will find J. D. Visible in greatest demand

Visible Idea Worked Out Perfectly for the First Time

The "visible gap" feature, so far as being incorporated in a plug, has always seemed as far away as perpetual motion. The visible feature has been marketed in a separate device for years, but this is the only plug in which this important visible feature is actually embodied.

It is simple. Merely a hole in the porcelain and a spiral action to regulate width of the gap in the central electrode which carries the current.

The hole in no way lessens the strength of the plug, and the current in jumping the "visible gap" loses none of its efficiency. On the other hand it intensifies the spark at the gap in the cylinder.

Additional prestige is lent the J. D. Visible Spark Plug by the fact that it is being introduced by the largest manufacturers of spark plugs in the world. We are exclusively manufacturers of spark plugs; we make millions of them each year.

The J. D. Spark Plug was a famous plug before it was improved by the visible feature. It combines finest workmanship, best materials and simplest designs.

Every part of this plug is made in our factory—even the porcelain being produced in our own potteries from clays and other ingredients imported from Europe.

This unequivocal guarantee goes with all our spark plugs:

"Your money back or a new plug if you are not satisfied."

If your dealer hasn't the J. D. Visible yet, send your money direct to us for a set, specifying size wanted and make of car, and we will ship them postpaid. Remember, the J. D. Visible Plug is $1.00. Our literature on ignition free for the asking.

JEFFERY-DEWITT COMPANY, 565 Butler Ave., Detroit, Mich.

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Double Your Box Business in 1913



In 1912 Globe Steel Boxes outsold every other automobile box on the market. Sales exceeded 100,000 boxes.

In 1913 Globe Boxes will lead again. Several new sizes for which there is big demand make the Globe line the most complete and most profitable line for the dealer and jobber.

GLOBE STEEL Tool and Battery Boxes

Their selling points are obvious – heavy steel, water-tight construction, electrically welded back, one piece covers, wood linings, beautiful design and finish, brass, nickel plated or oxidized trimmings and many other features.

Forty-seven of the leading makers of automobiles are featuring Globe Boxes as standard equip nent on their cars. And these cars range in price from the Luxurious Lozier to the Vanadium built Ford.

Globe Boxes are now made in thirty different styles and sizes. Each style is made to meet a particular requirement of the car owner or manufacturer. And every box is stamped with the Globe trade mark which means that the dealer or jobber selling this box is offering the buyer the most box value that money can buy.

If you are not already carrying the Globe line, contract now and cash in on the 1913 business.

GLOBE STEEL BOXES

Write for 1913 catalog today

THE GLOBE MACHINE & STAMPING COMPANY
Cleveland, Ohio

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DEALERS!

Answer these Questions

Why can a man buy a house

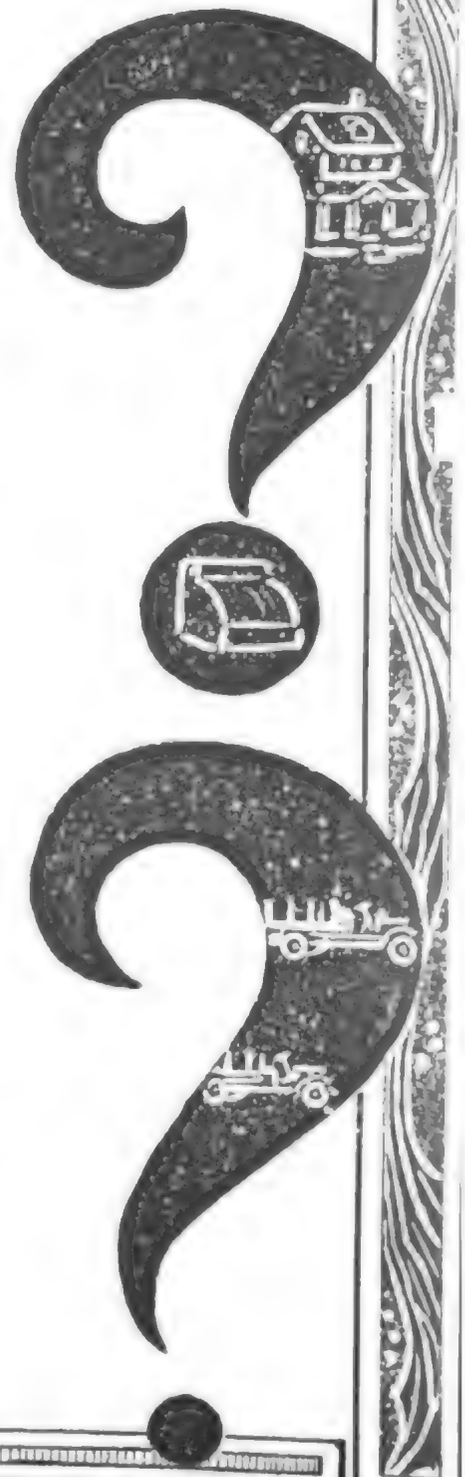
Or equip his plant with machinery

Or buy a Cash Register

Or almost any other commodity—all on the Installment plan

and

Why shouldn't a truck manufacturer furnish you with Commercial Cars on this plan to sell on the same basis

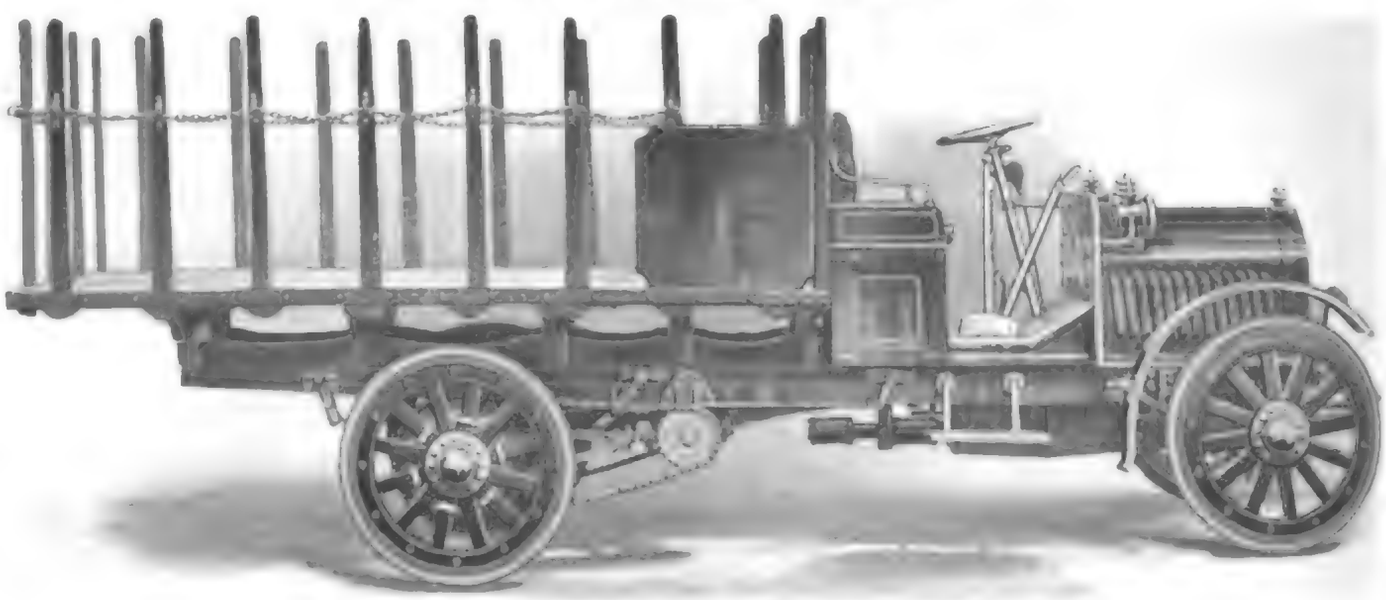


THE LATTER QUESTION IS ANSWERED ON NEXT THREE PAGES

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It Can Be Easily Done

You, Mr DEALER, Can Sell THE SELDEN TRUCK Shown Here



On a Time Payment Basis That Will Enable You To Handle Legitimate Business Which Cannot Be Handled In Any Other Way

And It's Strange that the Plan

and We Are Doing It

Why We Do It — How We Do It

There isn't a dealer anywhere who does not realize that the greatest obstacle in the way of increasing automobile sales lies in the LACK OF READY CAPITAL—and this is emphasized in the commercial field, where trucks are greatly needed by merchants and light manufacturers who cannot afford to take enough money out of their business to purchase the machine outright.

And there are dealers a-plenty who lack capital sufficient to carry the accounts of firms that WOULD buy from the dealer on a credit basis, even if the dealer could stand the strain. This condition furnishes the motive back of the Selden plan presented on the opposite page. This plan is just as simple as the advertisement covering it and just as practical and commercial as any installment selling agreement in the whole wide field of partial payment business.

We Are the Pioneers in the Plan of Selling Motor Trucks on the Partial Payment Basis

We make it easy for you to sell, and for your prospective customers to buy the very best one ton truck on the market on easy terms and at a rational price.

This is the most progressive step ever taken in the history of the automobile industry. We are the pioneers in the movement and we guarantee that the Selden method of selling trucks will prove a big stimulus to your business, in the placing of Selden trucks with those who need them and ought to have them.

You may ask "How can your company lay out so much money without demanding an unusual rate of interest?" The answer is simple.

The Selden Factory is one with ample facilities for purchasing and manufacturing on a scale that materially reduces the cost of production. These savings go back into quality of production and they reduce our interest charges to a nominal and perfectly legal rate, and on the other hand our company is backed by unlimited resources which enable us to handle this business on practically a cash basis so far as our net income is concerned.

DEALERS CONSIDER THIS CAREFULLY

Think it over—look at it from every viewpoint, remembering always that the Selden business is built on square dealing and honesty in policy and manufacturing methods—then granting that you CAN sell the best one ton truck at a cash deal price and on the installment basis, isn't the opportunity too big to let slip?

This proposition is of vital interest to you. It is worth your investigation. We are prepared to present facts and figures strong enough to prove that you, as our representative, have the biggest selling opportunity ever offered an automobile dealer.

Now read the next page of this insert, giving in brief the features of the SELDEN ONE TON TRUCK—Then write for full information and get your territory first.

Was Never Thought of Before

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Quality Simplicity **SELDEN** One Ton **TRUCKS** Service Economy

GENERAL SPECIFICATIONS
OF THE
SELDEN 1-TON TRUCK

AXLES. Front, I-beam forging 1⅛" x 3" x ⅜" web. Rear, solid forging 2" x 2¾". Both heat treated.

BRAKES. Foot pedal operates internal brakes on jackshaft. Emergency lever operates 16" internal brakes on rear wheels.

CAPACITY. 2000 lbs.

CLUTCH. Multiple disc, dry plate. Integral with transmission.

COOLING. Vertical tube radiator; circulation by positive driven centrifugal pump and fan mounted on Motor.

DRIVE. The drive from Unit Power Plant is through universal joint to jackshaft; then by side chains to rear axle.

EQUIPMENT. Three oil lamps, horn, jack and set of tools; driver's seat.

FRAME. Pressed steel channel section 5⅛" deep. Bumper in rear. Front cross member detachable so as to facilitate removal of Unit Power Plant.

GASOLINE TANK. Drawn seamless steel tank, tinned inside and out. Capacity 20 gallons.

HEIGHT OF FRAME. Frame 29½" from ground when loaded.

HORSE POWER. 23 H. P. (S. A. E.)

IGNITION. Dual. Magneto driven at crankshaft speed.

JACKSHAFT. The jackshaft is fastened to frame by spherical bearings, so that distortion of frame under extreme road conditions does not affect jackshaft. The drive shafts are 1⅜" diameter of alloy steel, and heat treated. Bevel gear type and differential. Five Pitch Driving Gears, Hyatt Roller Bearings throughout.

LOADING SPACE. The available space back of driver's seat is 8 ft. 6" on the short wheelbase and 10 ft. 2" on the long wheelbase. The frame width is 32". The extreme outside width of body, without using bolsters, is 46½". Using a 3" bolster or sub sill a body 52½" outside will clear sprocket chains. A bolster 10½" high will raise the body over the rear wheels, give necessary clearance for jounce and allow any width of body to be built. Where light bulky merchandise is carried, it is permissible to let the body extend eight to ten inches beyond the frame.

MOTOR. Four cylinder vertical, cast "en bloc," Unit Power Plant type. Bore 3¼" x stroke 5¼". Maximum motor speed 1150 controlled by sealed governor.

SPEED. Sixteen miles per hour maximum allowed by governor.

SPRINGS. Front 42" long, 2¼" wide. Rear 48" long, 2½" wide. Semi-elliptic both front and rear.

SPEED CHANGE. The control levers are placed in the center and steering gear on the left. This arrangement gives easy access in and out of the driver's seat from the right-hand curb.

STEERING GEAR. Worm and nut type. 18" wheel.

TRANSMISSION. Transmission is bolted to, and is supported by the motor, according to the best practice in Unit Power Plant construction. This construction keeps the transmission and motor in alignment regardless of strains produced by faulty loading of the truck. It is of the selective sliding gear type, having three speeds forward and one reverse. The gears and shafts are of ample proportions, and are made from heat treated nickel steel. Timken bearings are used throughout the transmission.

TREAD. 56" front, 60" rear.

TIRES. Solid rubber front 36 x 3½, solid rubber rear 30 x 4. S. A. E. demountable.

WHEELS. Wheels are artillery type, hickory, twelve 2" spokes. S. A. E. rims are furnished as standard, allowing detachable tire rims to be used.

WHEELBASE. Optional. 125" or 145".

WEIGHT OF CHASSIS. Less tires and rims, 3100 pounds.

PRICE. Chassis, $2000. F. O. B. Rochester, N. Y. We can furnish several types of bodies and will quote prices upon application.

SELDEN TRUCK SALES CO.
210 East Avenue, —— Rochester, N.Y.

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Kelly-Springfield Automobile Tires at the Garden Show

If you've got an automobile we want you to stop and let us show you how Kelly-Springfield Tires are built up. There is just one thing we can't show you—and that is the quality of endurance in these tires which only months of road wear can bring out.

KELLY-SPRINGFIELD TIRE COMPANY, 20 Vesey Street, New York

Branch offices in New York, Chicago, Philadelphia, Boston, St. Louis, Detroit, Cincinnati, San Francisco, Los Angeles, Cleveland, Baltimore, Seattle, Atlanta, Akron, O., Buffalo

The Hearn Tire & Rubber Co., Columbus, Ohio
Boss Rubber Co., Denver, Colo.
Southern Hdwe. & Woodstock Co., Ltd., New Orleans, La.
Savell Davis Rubber Works, Augusta and Savannah, Ga.
Betsing Tire & Rubber Co., Houston, Texas
Todd Rubber Co., New Haven Conn.
Atkinson Tire & Supply Co., Jacksonville, Fla.
L. D. Franke & Co., Charleston, S. C.

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WESTON-MOTT CO. FACTORIES AT FLINT, MICH.

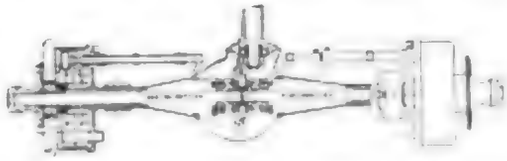
WESTON MOTT CO

FLINT, MICH.

The unequalled success of the Weston-Mott Co. in the manufacture of automobile

AXLES
HUBS
RIMS

Is the result of many years of actual experience combined with the efforts of engineering ability of the highest order and mechanical skill that has no superior.





PART OF FRONT AXLE PLANT



PORTION OF FRONT AXLE PLANT



LARGEST MAKERS OF AUTOMOBILE AXLES, HUBS AND RIMS IN THE WORLD

WESTON MOTT CO

FLINT, MICH.

VISIT OUR EXHIBIT AT THE NEW YORK SHOW

There you will find the latest products of our mammoth plant. At least one big surprise awaits you.





PART OF HUB DEPARTMENT



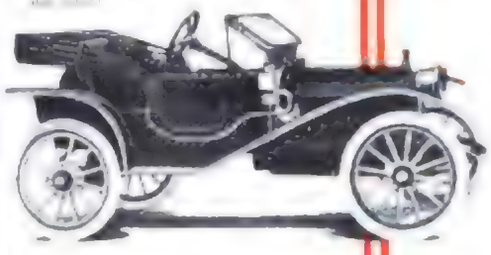
ANOTHER PART OF FRONT AXLE PLANT

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Six Passenger "32"

$1175 F. O. B. Detroit, top equipped of two folding and reversible seats in tonneau and rear standard metallic top with envelope, lifts, quick detachable rims, rear shock absorber, gas headlights. Prest-O-Lite tank, oil lamps, tools and horn. Wheelbase 132 inches, 32 x 4 inch tires. 135 inch wheelbase. 32 x 4 inch tires.



"20" Runabout, Fully Equipped

$550 F. O. B. Detroit. Four cylinders, 20 H. P., sliding gear, Bosch magneto, windshield, gas lamps and generator, oil lamps, tools and horn.

32" Touring Car is Roadster, seats 2 adults and 2 children, fully equipped. $975 F. O. B. Detroit.

Hupmobile

The "32" Coupe

A distinguished addition to a distinguished line

First View, New York Motor Show, Jan. 11-18

In exterior appearance the Hupmobile Coupe is as unobtrusively unique and as well-balanced as the other models of the "32" type.

In interior finish and appointment, it is rich and luxurious—imported Bedford Cord upholstery, with side walls to match and ceiling done in heavy satin; with right-hand control and room for three adults in comfort.

The coupe rounds out the line of Hupmobile pleasure cars, which now includes two touring models and a roadster, all built on the same sturdy "32" chassis, and the well-known "20" Runabout.

The entire line will be displayed at the New York and Chicago shows.

Inspect the cars there, at any other shows or at the dealer's; and you will see why we believe the Hupmobile to be, in its class, the best car in the world.

Hupp Motor Car Company

1254 Milwaukee Ave. Detroit, Mich.



Three Passenger "32" Coupe

$1250 F. O. B. Detroit, including equipment of electric lights and 100 ampere battery, electric horn, speedometer with clock, extra wide seat for three passengers, 54 x 22 inches; quick detachable rims, 33 x 4-inch tires, rear shock absorber, 106-inch wheelbase. Standard color, black. Trimmings, black and nickel.

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MERCER

ANNOUNCING

Type 35, Series G, Four-Passenger
Type 35, Series H, Five-Passenger
Type 35, Series J, Raceabout
Type 35, Series K, Runabout

A NEW series of Mercer cars that appeal directly to the Motorist who realizes that bulk and weight are no longer essential in a motor car of the highest type. The Mercer is the "happy medium" car—neither too heavy nor too light.

Power, strength, durability, consistency of performance, comfortable riding qualities, graceful appearance, up-to-the-minute appointments, and real legitimate dollars-and-cents value, are what influence wise buyers in their choice of a car. Measured by this standard the Mercer is recognized as leader of the medium-weight class.

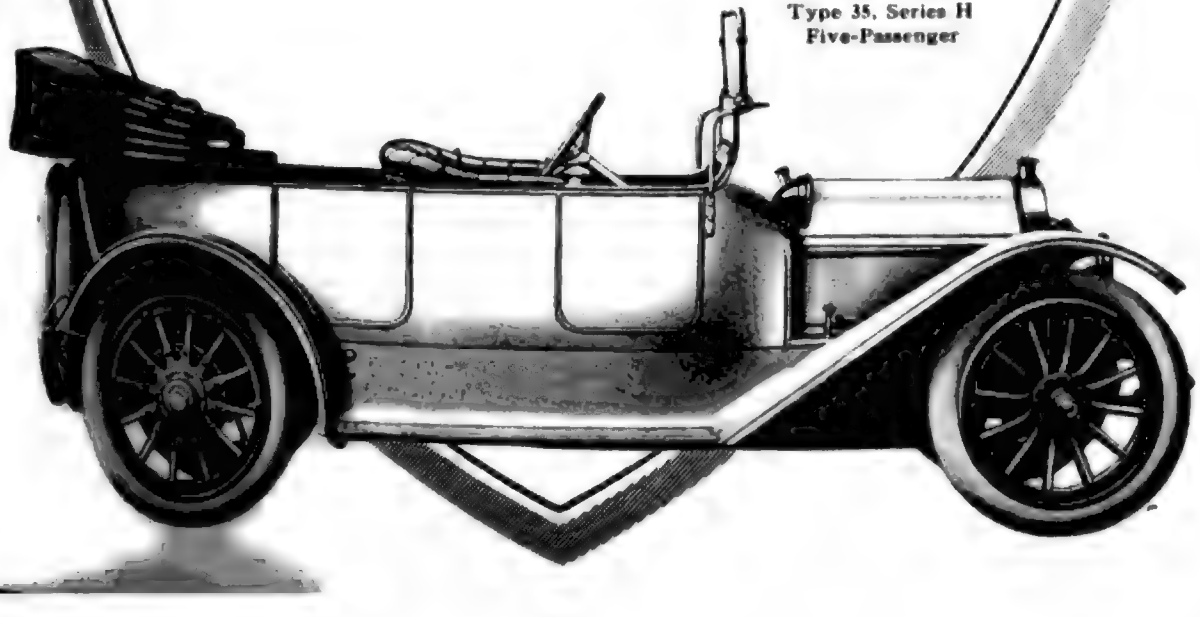
Pronounced features are high efficiency motor, perfect lubricating system, reliable steering gear, large and perfectly balanced crank shaft, four-speed transmission, foot brake operating on transmission, springs that give real riding comfort, two-spark Bosch magneto of enclosed type, Rushmore electric lighting and starting systems, both separate units and operating independently of ignition, distinctive and exclusive body designs.

Prices: $2600 to $2900

Descriptive Literature Sent on Request

MERCER AUTOMOBILE COMPANY

700 WHITEHEAD ROAD, TRENTON, N. J.



Type 35, Series H
Five-Passenger

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THE LONG HORN

As Effective As The Lion's Roar

Announcing the "Junior Long" Horn

The greatest automobile horn value ever offered—

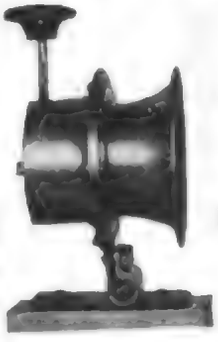
$11.00

It differs from the original Long Horn in size only, its construction is just as perfect.

Here is the Model "J. S." Junior



OUR JUNIOR LONG HORNS



Here is the Model "J. M." Motorcycle

And remember, please, that $11.00 represents the total and final expenditure your customer makes when he purchases a Long Horn. After that the Long Horn costs him nothing—for the Long Horn is an absolutely dependable, never-failing, mechanically operated horn—louder than most electric horns—requires only a push of the button to issue a warning. There are no batteries to wear out—no motor to break down—no bulb to rot or crack—nothing to get out of order at all.



The addition of this $11.00 Junior, Model "J. S."; of the Model "D," which has a cable and dash board attachment, and the motorcycle Model "J. M." make the Long Horn line the most complete warning signal line manufactured.

No dealer can afford not to carry them for there is a marked demand for the Long Horn which is increasing rapidly.



This shows our Model "D" type attached to a car. This model admits of the installation of the horn as shown some distance away from the driver. The operation is by means of a Bowden wire cable.

The G. Piel Company

13th Street and Boulevard

LONG ISLAND CITY, N. Y.

Sales and Attaching Rooms:
51 West 63rd St., corner Broadway,
NEW YORK CITY.

Boston: 109 Massachusetts Ave.
Buffalo: 20 Goodrich St.
Chicago: 1461 Michigan Blvd.
Denver: 15th and Curtis Sts.
Philadelphia: 1427 Vine St.
San Francisco: 530 Golden Gate Ave.
Seattle: 1229 So. Olive St.
Portland: 329 Ankany St.
Detroit: 510 Majestic Bldg.

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INTERLOCKS

Double Your Mileage

INTERLOCK INNER-TIRE

Prevent
Blow-Outs and Punctures
Save Half Your Tire Expense

If you really believed this you would order a set of Interlocks for your car at once. We can prove our statements if you will give us the opportunity. Thousands of car owners are discarding inner shoes, reliners, fillers, extra treads and other makeshifts for Interlock Inner Tires with the most satisfactory results. A set of new tires equipped with Interlocks will carry your car an entire season without tire trouble. That's a big statement, but we can prove it.

What Interlocks Are Interlock Inner Tires are complete endless inner tires (not inner shoes) quickly and easily placed between the outer casing and the inner tube. They strengthen the outer case and protect the inner tube from punctures. The patented Interlock Flaps lock the Interlock securely making it an integral part of the whole tire that flexes perfectly and cannot chafe, creep or heat. Interlock Inner Tires will hold even if the outer casing is broken, and can be used in old or new tires. They double the mileage of new tires and add 1,000 to 5,000 extra miles to old ones. Interlocks have a fine gray rubber finish, are smooth outside and inside and have no troublesome ends, joints or edges to cement. Interlocks do not affect the resilience of your tires, are easy to insert and can easily be removed from one tire and replaced in another.

Proved Best by Road Tests Interlock Inner Tires are the only tire reinforcement that has stood the severest test of hard road work. Interlock tires equipped with Interlocks have made over 7,000 miles each, a total of 56,000 miles, without a blow-out or any tire trouble. Interlocks used in tires that have gone 10,000 miles with the outer casings worn clear through have kept up with fast cars equipped with new tires and carrying extra tires. Interlocks have made a 4,500 mile cross country run—the last 1,000 miles over 20 mountain ranges without a blow-out or even carrying an extra tire. In the Four States Run Interlocks stood the test of hard fast road work under the critical observation of tire experts, without tire trouble. These and other hard public tests have proved the efficiency of Interlock Inner Tires beyond question.

90% Of All Tires Are Scrapped Before The Rubber Tread is Half Worn Out

because the fabric is not strong enough to resist hard road work, resulting in blow-outs, punctures, rim cuts, etc. The liberal excess fabric strength of tires equipped with Interlocks prevents blow-outs, punctures, etc., gives extreme long mileage, safety, and that freedom from tire trouble which every car owner desires.

Are You Open to Conviction?

Send us your address on a post card and let us mail you our booklets, data and testimonials of users which are very convincing. Interlocks are sold by the best dealers everywhere. Ask your dealer about them. See our exhibits at New York, Chicago and Boston Shows.

Double Fabric Tire Co.
600 W. 9th Street Auburn, Ind.



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And it Delivered the Goods

4145 Miles

Over boulevarded highways in the East it sped; through sand two feet deep in Ohio; across trackless prairies in Illinois, with the heat of a sizzling sun beating down. It crashed through weak bridges in Iowa and conquered roads of gumbo. The alkali mud of Colorado was no barrier; its progress was not checked by cloudbursts in Wyoming, by steep-sided gullies, by deep ruts, by roads submerged.

It cut a new roadway over the broad expanse in Utah; it crossed the Great Salt Lake Desert, often 150 miles from habitation; battled with hailstorms, rainstorms and snowstorms in Nevada; climbed the tall peaks of the Sierras that seemed to mount to the skies.

At last into California!

It pressed onward to San Francisco; then 35 miles to the north. And the first load of goods ever delivered across the continent by motor truck had reached its destination.



It completed the journey of 4,145 miles in 412 hours of actual running time.

Across 15 states it hauled a 3-ton load of Parrot Brand Olive Silk Soap, the product of its owners, Charles W. Young & Company, from Philadelphia to a customer in Petaluma, Cal. It faced the most terrific conditions ever forced upon a motor truck; received the most gruelling tests yet supplied in business service. But it delivered the goods!

ALCO
Motor Trucks
6½ ton 5 ton 3½ ton 2 ton

The achievement of this Alco truck simply punctuates the strongest claim we have ever made.

Simply demonstrates why other Alco trucks are serving and saving for leaders in more than a hundred lines of business in America, in the tropics, in Alaska, in Canada, in the Philipine Islands and so on.

Write for information about Alco trucks in your line of business.

Address Department E

AMERICAN LOCOMOTIVE COMPANY, 1886 Broadway, NEW YORK

Builders of Alco Motor Cars and Alco Taxicabs

Movers of the World's Goods since 1835. Capital, $50,000,000





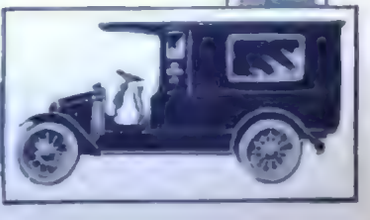
A Message to Dealers

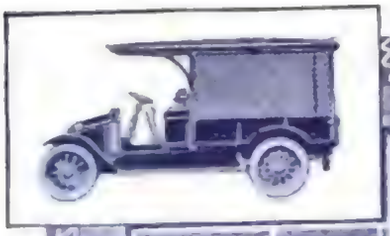
Stewart Delivery Cars



Reliable Economical Profitable







FEATURES WHIC

CONTINENTAL MOTOR, 30 H

TIMKEN AXLES, BOTH FRONT AND REAR BOSCH MAGNE

MULTIPLE DISC DRY-PLATE CLUTCH

BIG TIRES, 4 1-2 INCH FRONT AND REAR

BODIES OF NEW DESIGN, 7 FOOT LOADING SPACE

OUR SHOW SPACE
NEW YORK
Space A-23
GRAND CENTRAL PALACE

It is simply impossible to convey by words the far-beyond - your - expectation - value we are building into Stewart Delivery Cars.

Dozens of dealers to whom we have painted our picture most vividly have been amazed when finally they have seen a Stewart Delivery Car.

Why?

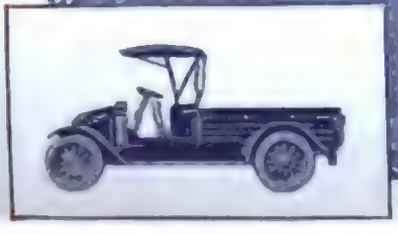
Because no delivery proposition that has ever been offered before is in any way comparable to ours.

There are cheaper cars and more costly cars—

Higher powered and with bigger capacity—

But none of ***our*** capacity and efficiency at anything like ***our*** price.





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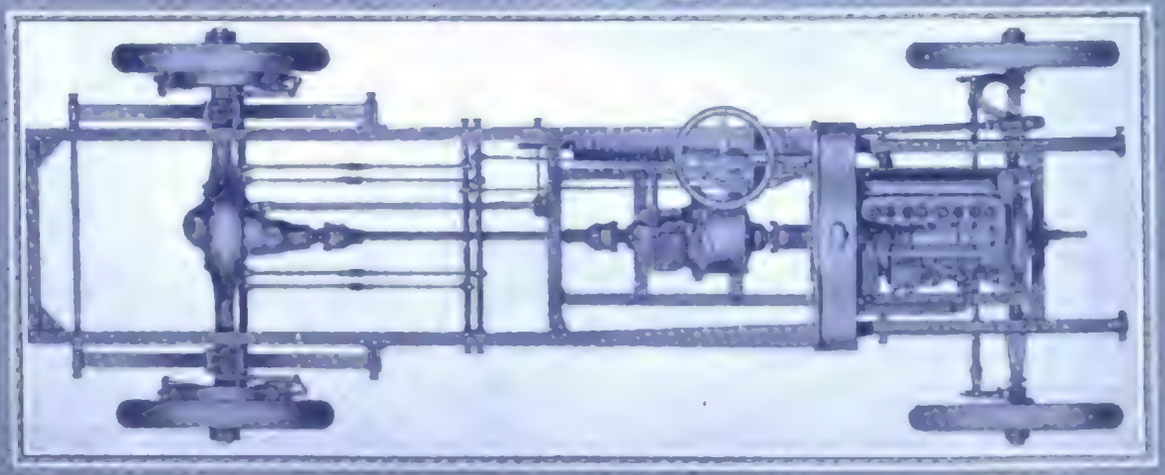




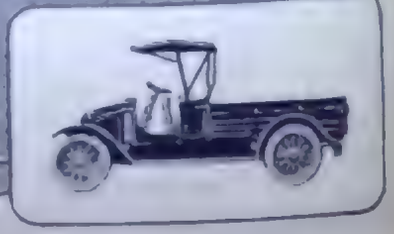


Stewart

Delivery Cars







Stewart Motor Corporation.

Buffalo, N.Y.

T. R. Lippard, *Pres. and Gen'l Mgr.*
R. G. Stewart, *Vice Pres. and Chief Eng.*
R. P. Lentz, *Sec. and Treas.*
Robt. W. Ingersoll, *Sales Mgr.*

KISSELKAR TRUCKS



Reserve power and low cost of operation

THESE are the elements which make KisselKar Trucks profitable in every line of business, which, together with special mechanical features, the responsibility of the manufacturers, and the KisselKar Service organization, will give KisselKar commercial vehicles the soundest standing with careful buyers.

1500 lbs., 1, 2, 3, 4, 5 Ton Trucks Delivery Wagons, Omnibuses, Fire Department Apparatus, etc.

All type bodies—special bodies designed to meet special needs and specially built. Write for special truck catalog, illustrating KisselKar commercial vehicles as engaged in every line of business.

KisselKar Service KisselKar Service cares for your truck, insures lowest operating costs and dependable efficiency. It is supplied by a national service organization, maintained by the manufacturers with service-centers at principal points, manned by factory-trained men, extending such service as keeps KisselKar Trucks up to fullest capabilities at lowest cost and slowest depreciation.

Mechanical Features

Four speed transmission, fourth speed geared up for fast running without racing engine.

Lock on differential, locking both traction wheels together when otherwise a slipping wheel would absorb all power and stall the truck.

15% to 20% more economical of fuel than average trucks.

Simple control.

Reserve power.

Accessibility.

Write for truck catalog.

Kissel Motor Car Co., 159 Kissel Avenue, Hartford, Wis.

Boston New York Chicago Milwaukee Kansas City Los Angeles Minneapolis St. Paul Dallas

Philadelphia, Cleveland, Detroit, El Paso, San Antonio, New Orleans, Baltimore, Omaha, Butte, Denver, San Francisco, Seattle, Portland, Duluth, Buffalo, Pittsburgh, Hartford, Conn., New Haven, Albany, Troy, Montreal, Quebec, Toronto, Winnipeg, and 200 other principal points throughout America.

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SHAWMUT TIRES



SHAWMUT Red & Grey TUBES



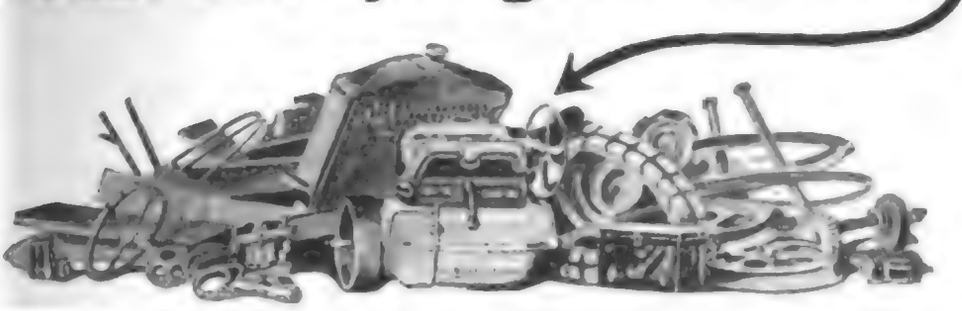
Manufactured by

HOOD RUBBER COMPANY

Watertown, Mass.

Unscramble Your Truck

and what have you got but this?



Mr. Careful Buyer—select your truck the way the sharp trader bought his horse in those bygone days of Horse Trading—in the "knocked-down" fashion—*a combination* of so much sound legs+healthy teeth+sound stomach+unimpaired wind+style, etc.

Buy your Truck as an "assembly of accessories"—a reliable chassis and springs+an efficient motor+a flexible carburetor+a dependable magneto+a pleasing appearance, etc.

And remember that as a "horse is no stronger than his stomach" so A ***TRUCK IS NO BETTER THAN ITS MOTOR.*** *(There's only one moral—Get a* ***BUDA****!)*

Many a Truck is being sold today because the ***Salesman*** appreciates the *Selling Power* and the ***Buyer*** appreciates the *Service Value* of having a

BUDA MOTOR

Beneath the Hood

That prominent manufacturers look at the Buda (with its special oiling device, and exclusive "get-at-ableness") not as *a part of the Truck to Sell* but *The Part that helps to Sell the Truck,* is evident by the following partial list of manufacturers to whom we have sold—and are selling more ***BUDA*** motors:

Pleasure Cars:

Rodeo Motor Car Co.
Michigan Motor Car Co.
Henderson Motor Car Co.
Lozier Motor Car Co.
Benedict Motor Car Co.
Spaulding Mfg. Co.
Croxton Motor Co.
Nova Scotia Carriage and Motor Car Co.
Miller Motor Car Co.

Trucks:

Service Motor Car Co.
Bowling Green Motor Car Co.
Durant-Dort Carriage Co.
Hewitt Ludlow Auto Co.
Trim Wagon Co.
Brantford Motor Truck Co.
W. Landshaft & Sons
Harvey Motor Truck Co.
Hartburt Motor Truck Co.
Schacht Motor Car Co.
Chicago Pneumatic Tool Co.
Lord Baltimore Motor Car Co.
U. S. Government and others.

The Buda "Little Six"

will be ready for delivery by April first and is a product worthy of the Company which was the Pioneer of the "Cast-in-Block" method in U. S.

SHOW NOTICE:

We have spaces at all three of the 13th Annual Automobile Shows as follows:
Grand Central Palace, New York, January 11th to January 25th. Space No. 304, located in the Balcony.
Madison Square Garden, New York, January 11th to January 25th. Space No. 33, located in the Concert Hall.
Coliseum, Chicago, February 1st to February 15th. Spaces Nos. 102, 103, 104, located in Coliseum Annex, 2nd floor.

1913 Specifications
for Hyduty Commercial Motors:

Model "M" Motor, 3¾ x 4½
Model "O" Motor, 3¾ x 5½

Long Stroke, Enclosed Valves, Noiseless Timing Gears, Self-contained Oiling System. Extra large Valves and Bearings. Ample water jacket.

Send for Special Bulletin to

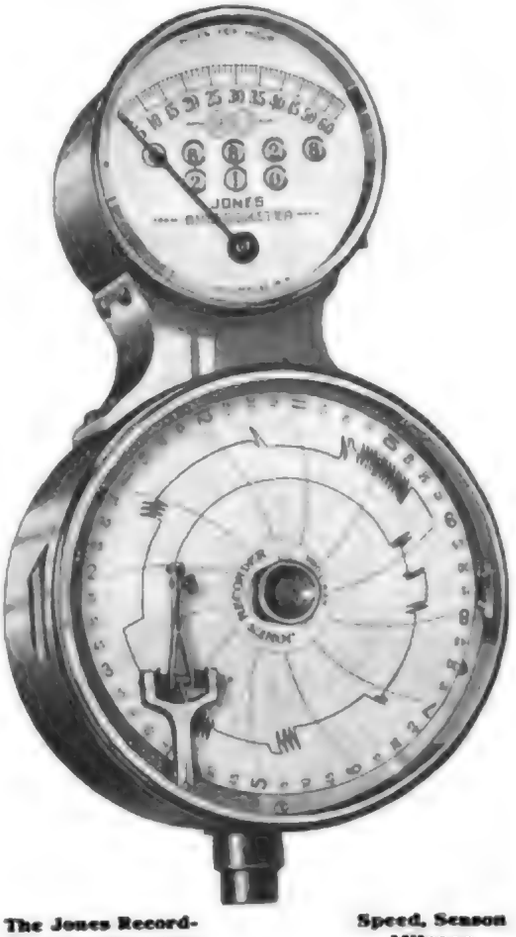
BRANDENBURG & COMPANY

1108 So. Michigan Ave., Chicago
57th and Broadway, New York City
Ford Building, Detroit

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Jones S

The Com
Jones Sp



The Jones Recording Speedometer Model 34-39.

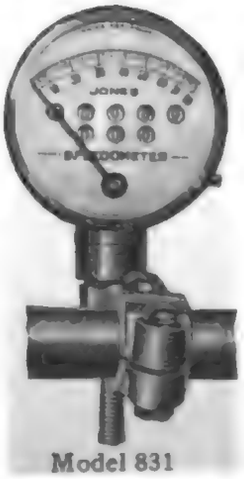
$100

Speed, Season Mileage
Trip Mileage
Time Record of Above

will be privately exhibited during Show Week at the Prince George Hotel, 27th Street between Madison and Fifth Avenues, as we have been unable to secure adequate space at the Madison Square Garden.

Any dealer in automobile supplies will be glad to show you his complete line of Jones Speedometers

The Speedometer by which the value of all others is measured.



Model 831

$20



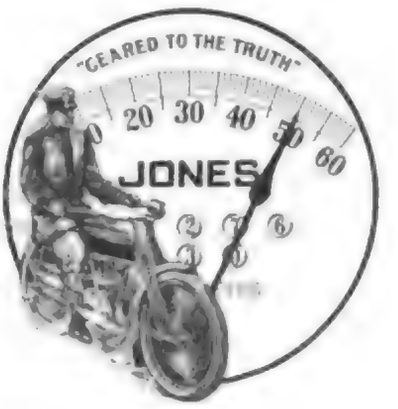
Model 34

$20

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eedometer

lete Line of edometers

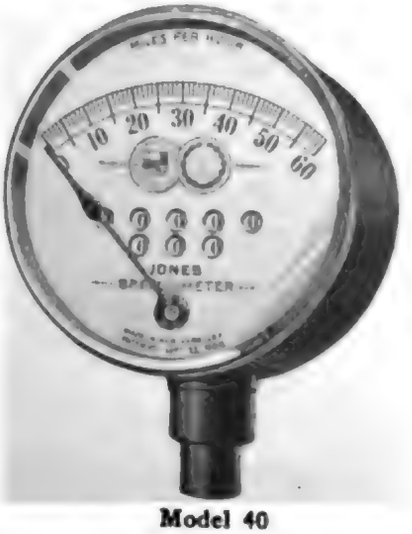


THE JONES—Centrifugal—SPEEDOMETER employing the same principle as the steam engine governor, is not affected by changes of temperature, or by the powerful magnetic influence of the electric system of lighting and starting now so generally used.

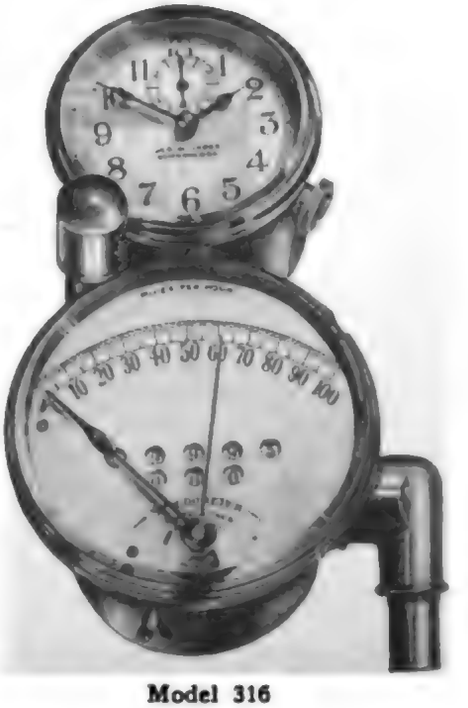
The Jones Speedometer, Bush Terminal, N. Y.
B'way and 76th St., N.Y.City



Model 29
$25



Model 40
$50



Model 316
$105

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Vitalized Rubber calls a halt on "Short Mileage!"



At last science gives you more rubber shod mileage

Diamond (No Clinch) Tires

now made of VITALIZED RUBBER—a scientific combination of pure rubber and a toughening compound.



You can get Vitalized Rubber in Diamond Tires—NOW

A tire containing too much rubber fails to give the necessary mileage because it is not tough enough to withstand road usage. And the tire containing too little pure rubber has not the necessary staying qualities.

Our chemists have discovered the secret of how to mix pure rubber and a toughening compound in just the right proportions. The result is additional mileage for you. The pure rubber we use comes direct from the trees of the tropics—it is fresh and contains all the vitality of youth—it is elastic and easy riding. Then we mix this pure rubber with the secret toughening compound, which gives it the necessary vitalizing, wearing, *more mileage* quality.

This scientific combination has been vainly sought after for years by tire makers. After 15 years of successful tire making we have solved the problem—and you enjoy the benefit of our really wonderful discovery—in "Diamond" Vitalized Rubber Tires.

Add to this the Diamond proven principles of proper construction—nothing inferior in rubber, fabric or workmanship—and you have as perfect a tire as money can buy.

Here is a combination of easy riding and more mileage advantages you can't get in any other tire today—*Vitalized Rubber*, *Perfect 3-Point Rim Contact*, *No-Pinch Safety Flap*, and, if you wish, the now famous Safety (Squeegee) Tread—made to fit all types of rims.

So this time specify "Diamonds"—you can get them at any of the

25,000 Diamond Dealers always at your Service

A perfect 3-Point Rim Contact tire at last

Fifty per cent of all tires are ruined through lack of perfect rim contact.

Perfect 3-Point-Rim-Contact is just as big an advantage in tire construction as 3-point suspension in the automobile.

Diamond 3-Point Contact Tires hold with a vise-like grip absolutely preventing the tire from breaking above the rim, insuring no rim skid—no rim cutting—no rim trouble at all.

Our engineers have mastered the principles of Rim Contact construction, and you can get the Diamond (No-Clinch) Tire, with a perfect 3-Point Rim Contact—an important advantage that has been overlooked by all other tire makers.

"More Mileage" Book—Free

If you are not entirely satisfied with the mileage you are getting now—if you wish to reduce your tire upkeep—send today for our new book, "How to Get More Mileage Out of Your Tires." It is free to every tire user. No matter what tire you ride on, you simply cannot afford to be without this valuable book, so send the coupon today.

Mail This Coupon TODAY

THE DIAMOND RUBBER COMPANY, M4
Akron, Ohio.

If there is a way for me to get more mileage out of my tires, I would like to know it. Without obligation on my part, send me free, and postpaid, by return mail, your new book, "How to Get More Mileage Out of Your Tires."

Name _____

Address _____

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The Atwater Kent Ignition System

DEALERS and REPAIRMEN

HERE are a few good Atwater Kent "talking points." You can make them make you money.

Its simplicity of mechanism—no vibrators, relays, or commutator—just one contact point regardless of the number of cylinders and only three moving parts, none of which are subject to excessive wear.

Its single adjustment easily and quickly made and seldom requiring attention.

Its adaptability and easy installation on any standard make of motor, new or old.

It is ideal for use in connection with lighting and starting equipment as it produces a hot dynamic spark, perfectly timed regardless of the engine speed.

While the Atwater Kent System is high in value and reputation, it is not high in price. In fact, it will cost less than half as much as a good magneto and will give superior results at a much less cost of upkeep.





There are now two types of Atwater Kent Ignition equipment—standard **Type F** and the new **Type K**, the latter having the automatic spark control and insulated primary circuit features.

PRICES OF THE TYPE F SYSTEM

	Standard Coil.	Kick Switch Coil.
1-cylinder	$17.00	
2-cylinder opposed	18.00	
2-cylinder distributor type	22.00	$24.00
3-cylinder distributor type	25.00	27.00
4-cylinder distributor type	25.00	27.00
6-cylinder distributor type	27.00	29.00

PRICES OF THE TYPE K SYSTEM

	Standard Coil.	Kick Switch Coil.
2-cylinder	$32.00	$35.00
3-cylinder	35.00	38.00
4-cylinder	35.00	38.00
6-cylinder	37.00	40.00

In substituting the Atwater Kent System for the magneto or for driving it from any horizontal shaft or gear, we furnish a special magneto gear mounting, the additional price of which is $5.00.

You will have many inquiries for ignition equipment during the coming year and should be in a position to recommend the Atwater Kent whenever the most efficient ignition is desired.

Seize the opportunity and post yourself by a visit to our exhibit No. 140 Madison Square Garden Show, New York City, or write for our booklet "D."

ATWATER KENT MFG. WORKS

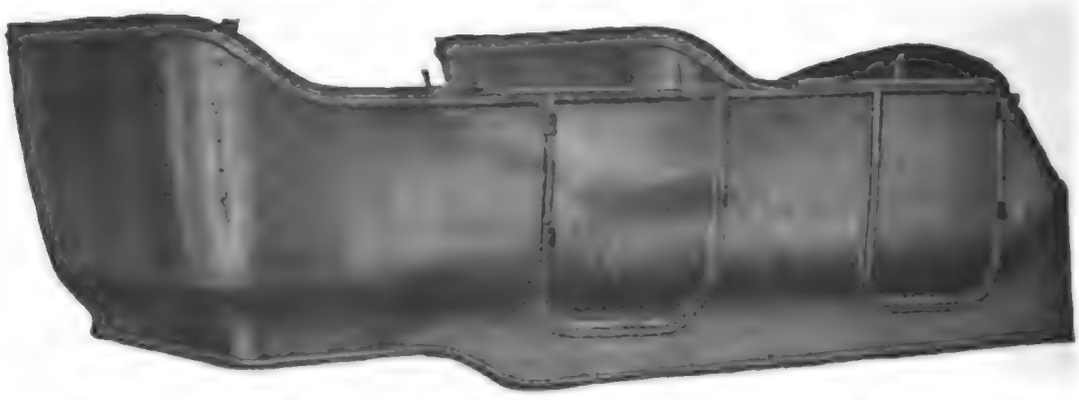
4934 Stenton Ave. Philadelphia, Pa.

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This trade-mark of quality is HAYES MFG. CO. HAYES DETROIT, MICH. *on more than 250,000 boxes*

The Line of Beauty

Leads to HAYES Bodies



THE looks of a car have a lot to do with the sales. Looks are in the body—in the clear, clean-cut horizontal, the swelling curve of the rear seat back, the correct proportioning of shroud and hood, the graceful sweep of the fenders. The eye of the buyer notes these points before it goes deeper to motor and transmission.

Why Not Make the Most of It?

The Hayes organization has spent its entire career in the building of handsome automobile bodies and sheet metal parts. To your needs it can bring an unexcelled experience. Its engineers know bodies as your engineers know motors. They are at your service and the results of their experience is yours when you want it.

Let our engineers go over your blue prints. They will show you the short cuts and offer suggestions worth money to you. They will make you fenders, hoods, shrouds—anything in sheet metal that you want—that will prove a revelation.

You will save time, trouble and money. The Hayes organization will "speed up" your production; will stop your worry; will do the work quicker and cheaper than you can do it yourself.

Certainly this is worth investigating.



HAYES MANUFACTURING COMPANY
DETROIT **MICHIGAN**

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THE Eisemann Magneto Company will not exhibit at the Automobile Shows this year. The decision to withdraw from the shows came only as the result of being unable to obtain space suitable for properly exploiting Eisemann products. We will have our entire staff on hand in New York during the New York Show and in Chicago during the Chicago Show. Arrangements have been made whereby all those desiring demonstration or information concerning any of our products will be well cared for.

With the exception of the addition of the Type E-B High Tension System with Separate Transformer Coil, there has been little or no change in the Eisemann products for the coming year. We will still continue to produce the type E-M High Tension Magneto, both dual and single; the types E-A, E-U and E-D in both single and dual, together with the Automatic Spark Control, which has proved itself to be so truly wonderful an instrument for commercial truck purposes. Obviously, an instrument that is advantageous in the operation of a truck is doubly so in a pleasure car, but the extreme advantage of the automatic system is so self evident as a commercial proposition that this branch of the industry has embraced it with open arms.

We wish to announce herewith the opening of a branch, complete repair shop, etc., in Detroit in charge of Mr. Fritz Neef.

On the succeeding pages, we have shown reproductions of a few of our models, practical demonstration of the merits of which we will be pleased to make you at any time.

The Eisemann Magneto Co.

Sales and General Offices:

225-227 W. 57th St, New York City

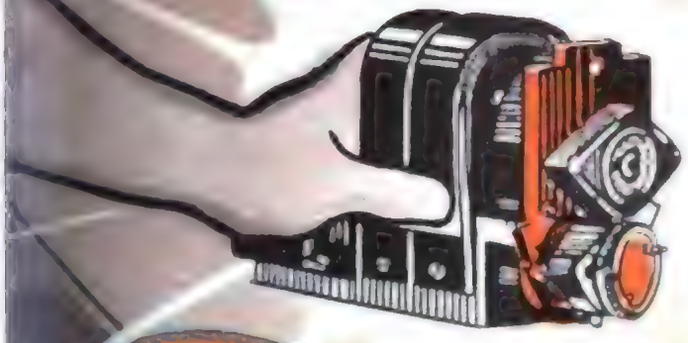
INDIANAPOLIS: 514 N. Capitol Ave. DETROIT: 802 Woodward Ave.

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Type E B 4 Cylinder
Type B D
Transformer Coil
THE EISEMANN MAGNETO

SE MANN

AUTOMATIC SPARK CONTROL





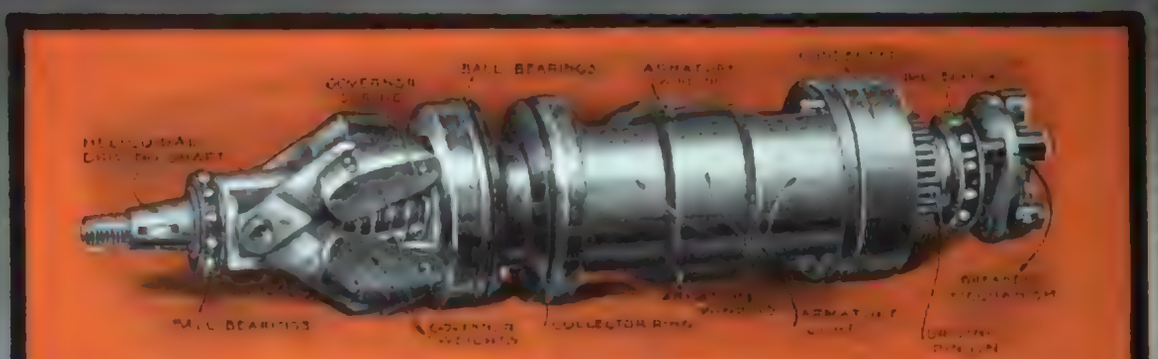
Type E M 4 Cylinder



Type E U R 6 Cylinder

223-227 WEST 57th STREET NEW YORK CITY

EISEMANN



Showing Details of Automatic Spark Control Armature

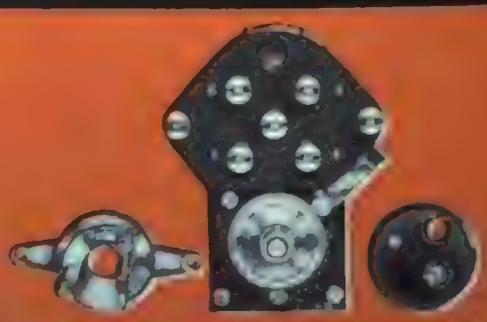


Type E M 4 Cylinder

SOME USERS OF EISEMANN MAGNETOS

Armleder Co.
Adams Bros. Co.
American Motors Co.
Austin Mfg. Co.
Avery Co
Bartholomew Co.
Bessemer M. T. Co.
Bowling Green M. C. Co.
Cass M. T. Co.
Clark Delivery Co.
Colby M. C. Co.
Croxton M. C. Co.
Easton Mch. Co.
Elk M. T. Co.
Empire Auto Co.
Federal M. T. Co.
Grant M. C. Co.
Gen'l Electric Co.
Haberer & Co.
Haynes Auto Co.
Herreshoff Mfg. Co.
Ideal Auto Co.
Ideal M. C. Co.
Kelly M. T. Co
Lauth-Juergens M. C. Co.
Lippard-Stewart M. C. Co
Lord Baltimore M. C. Co
Mais M. T. Co.
McFarlan Carriage Co
Midland M. C. Co
Minneapolis S. & M. Co.
Morgan M. T. Co
Motor Car Mfg. Co
Ohio M. C. Co.
Packard M. C. Co.
Palmer & Singer Mfg. Co.
Pilot M. C. Co.
Pope Mfg. Co.
Premier M. C. Mfg. Co

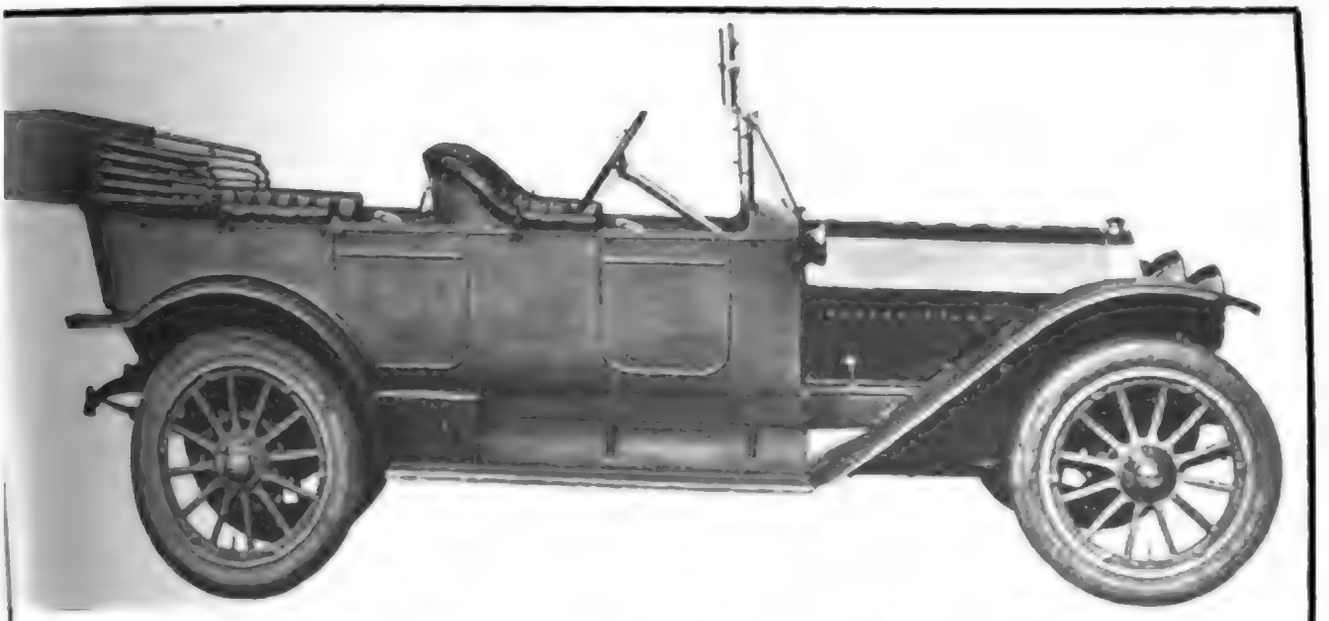
Randolph M. T. Co.
Saurer Motor Co.
Schacht M. C. Co.
Sayers & Scoville Co.
Schickel M. C. Co.
Sheldon Axle Co.
Sheffield M. C. Co.
Spaulding Mfg. Co.
Smith A. O. Co.
Speedwell M. C. Co.
Standard M. T. Co
Stayer Carriage Co.
Stegeman M. C. Co.
Sternberg Mfg. Co.
U. S. Carriage Co
Universal M. T. Co.
Vandewater & Co
Wichita Falls M. C. Co.
Wilson M. C. Co.
White Star Mfg. Co.
Whitcomb, G. W., Co
Woodworth M. T. Co.



Showing Simplicity of Type E B Breaker Mechanism

The Eisemann Magneto Co.

Sales and General Offices
225-227 W. 57th St., New York City
Indianapolis, 514 N. Capitol Ave. Detroit, 802 Woodward Ave



The Westcott Six, $2,475

Electrically Started and Lighted
127-inch Wheel Base---5 Passenger

The Westcott Line for 1913 is a glowing tribute to the whole science of automobile building—

The Westcott Motor Car Company occupy their supreme position in automobile manufacturing because of their excellent selection of the vital parts that make up the splendid Westcott Six—

The component parts of the New Westcott Six are built in plants whose whole endeavor has been to secure perfection in their individual fields; and

From the first, the Westcott Motor Car Company have turned their entire efforts to the joining of these separate units in one harmonious whole—

Westcott popularity is not due to the stimulation of public opinion through advertising—

The Westcott Line stands pre-eminent in a field of costlier cars because of actual performance and faithful service—

It is one of the few Six Cylinder Cars that possesses the tremendous "reserve power" so essential and so necessary to the success of the medium priced Six—

Because of the high favor in which the Westcott car is held by both the automobile trade and the buying public, it has been decided that the Westcott Line will be advertised extensively in 1913.

In advertising the Westcott Line we believe that we are rendering just as much service to the ultimate car buyer as we are to the dealers and ourselves—

The motor car buyer will no longer be compelled to buy the Westcott car on the favorable expressions of other Westcott car owners, however favorable they may be, but you have as their guarantee, and assurance of sincere service the positive statements and claims made for Westcott superiority by the people who build it.

Westcott Motor Car Company, RICHMOND, INDIANA

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COLLIER'S AUT

¶ Half a million subscribers will *see* the National Automobile Show through picture and story in the great Automobile Number of COLLIER'S WEEKLY.

¶ They will see this big annual event of the motor world quite as completely as those who actually visit the show. Experts will explain the progress of

MOBILE NUMBER

the year in automobile construction.

¶There will be photographs of the makers' latest achievements in engine, chassis and body.

¶Collier's Automobile Number will be a permanent record of the 1913 show which every motor enthusiast should read and keep.

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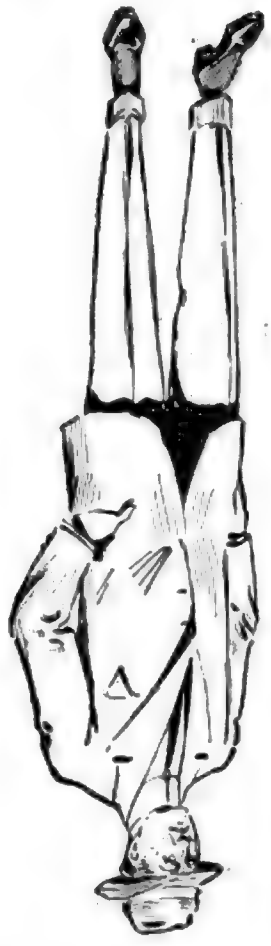
This Man is "In Wrong"

Get "In Right" with

ESTERLINE

on the

"Golden Glow" Lamp



THE 6-VOLT STARTING AND LIGHTING SYSTEM

Absolutely the Finest Line of Automobile Lamps, Electric Equipment and

THE BEST DEALER'S PROPOSITION OF THE YEAR

See the Golden Glow Lamps

at the shows. Then you'll see why your trade will want them.

We're going to help you sell Golden Glow Lamps. They stay sold, too—no comebacks. Here are a few of the novel features of Golden Glow Lamps.

Think of it—A bright, penetrating light but not dazzling; a reflector that will never tarnish, a reflector than can be cleaned without scratching, and a lamp body of correct and pleasing lines, without projecting hinges, latches and catches.

You'll want to see our 6 volt lighting dynamo. The only moving part is the armature. Current regulation is accomplished entirely by shifting magnetism in an iron circuit.

Our 40 pound, 6 volt starting motor is the equal of any starting motor made—regardless of weight. It spins the largest six cylinder motor without hesitation.

See Us at the Show

Manufacturers, dealers and owners, we want you to see this line. You'll find us at Space 301, Madison Square Garden, and Space 403, Grand Central Palace.

If you attend the Shows, don't fail to see these exhibits.

For those not attending the shows, we have prepared explanatory literature. Your copy is waiting for you. Send for it.

The Esterline Company

Engineers and Manufacturers

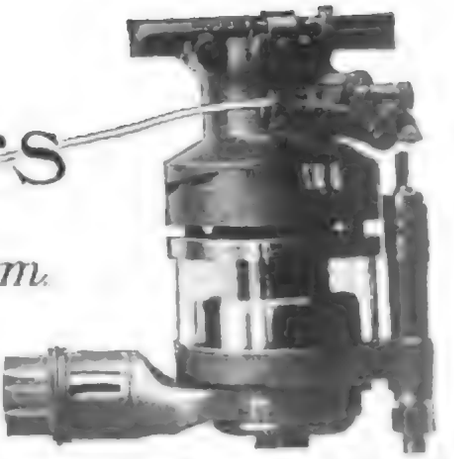
LAFAYETTE, IND.

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New-Miller Carburetors

"Adjusted *from* The Seat"





Your Automobile Is No Better Than It's CARBURETOR!

No matter how finely equipped—no matter what the other mechanical details—the entire efficiency of your motor depends upon the carburetion. Don't blame your engine—or other working parts—until you are sure the trouble isn't in the carburetor. There is but one carburetor made to give maximum power and proper mixture at low speed as well as high. That is the best carburetor you can use in your car. It is the:

New-Miller Carburetor

Try it out. If it isn't just as far above other carburetors—doesn't give you just as much better service—just as much saving of fuel as we claim—we are the losers.

Here are a few of its individual features that make it the best of all carburetors for your use.

New-Miller Carburetors are mechanically operated, the slightest movement of the throttle giving a positive movement to the auxiliary air and needle.

Once adjusted on your motor for low, intermediate and high, they never need another adjustment, taking care of weather conditions and variable grades of gasolene by a convenient control.

Besides being mechanically operated they are proportioned mechanically, all parts being manufactured to a standard on specially designed machinery, making every unit interchangeable.

By their control, admitting air as desired, they may be throttled low and save you enough fuel to pay for the carburetor itself in a season's use.

We have prepared a new Carburetor Book, giving the inside facts of carburetors—telling just how the New-Miller is made—giving complete details throughout.

It will pay you to send in the coupon below and get this information today.

Owners and Dealers are requested to see our Factory Representatives at Elevated Platform, Space 150, Madison Square Garden, New York Automobile Show, or Space 130-131, Coliseum Annex, Chicago Automobile Show.

New-Miller Carburetor Co.

520 N. Capitol Avenue
Indianapolis, Indiana

Territory for live dealers open. Apply to us or nearest representative:

E. J. Edmonds Co.....1783 Broadway, New York
Smith Bros.-Ellis.....311 W. Pico, Los Angeles, Cal.
Bertram Motor Car Co.....Salt Lake City, Utah
B. Gerdelman Mfg. Co.....4614 Washington Blvd., St. Louis, Mo.
L. C. Steers.....518 Grand River Ave., Detroit, Mich.
Van Camp Hdw. & Iron Co.....Indianapolis, Ind.
Denver Auto Goods Co.....Denver, Colo.

NEW-MILLER CARBURETOR CO.,
520 N. Capitol Ave., Indianapolis, Ind.
Gentlemen: Send me your descriptive Catalogue

My car is.....

Manifold is.....inches.....

Name .....

Address .....

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Jackson

No hill too steep
No sand too deep

Jackson dealers are enthusiastic; that's the story of the new Jacksons

When the first of the new Jacksons was announced, a wave of enthusiasm swept the country. Inquiries literally poured in.

That's how the buying public received the Jackson; and the same result followed the announcement of the other models.

What did the dealers do?

To a man they saw the great possibilities presented by the Jackson line.

Every one of them came in with requests—no, they were demands—for increased allotments.

"Sell?" they said, "you are giving us the best selling line of Jacksons you ever built!"

That's what they said when they were told about the cars.

Their enthusiasm was increased a hundred-fold when we outlined the most extensive advertising campaign the Jackson Company has ever attempted.

This advertising includes not only double pages and single pages in publications like the Saturday Evening Post, Collier's, Literary Digest, Life, etc., etc., but local newspaper advertising—continuous and consistent through the big selling seasons.

Is it any wonder that Jackson dealers are on tiptoe?

They have a line of cars they can sell in competition with anything on the market—on any basis whatever.

They are sure of themselves; sure of their cars; sure of factory co-operation through a big advertising campaign.

Their feet are on solid ground; they are in position to put ginger into their work and they are doing it.

If your instinct for business tells you that you want to be with the Jackson, say so to us and without delay.

The sooner you act, the better your chance if your territory is now without Jackson representation.

JACKSON AUTOMOBILE CO.

1204 East Main Street
JACKSON, MICHIGAN

Jackson "Sultanic"—$2650

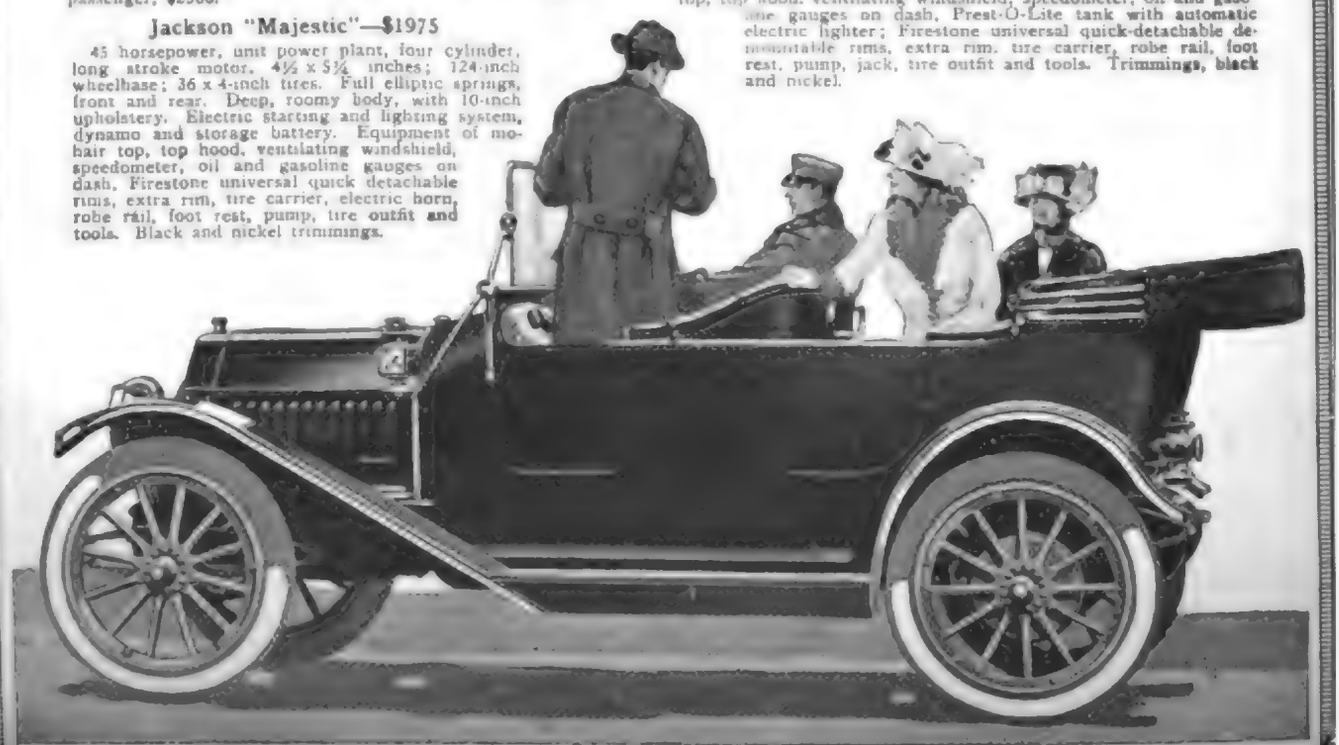
Seven passenger, six cylinder, 55 horsepower; unit power plant; long stroke motor—4½ x 4¾ inches; 138-inch wheelbase; 36 x 4½-inch tires. Full elliptic springs, front and rear. Deep roomy body, with 10-inch upholstery. Gasoline tank under dash supplied from storage tank at rear with pressure pump. Total capacity, twenty gallons. Electric starter, electric dynamo and lighting system, mohair top, top hood, ventilating windshield, speedometer, oil and gasoline gauges on dash, demountable wheels, extra wheel, wheel carrier, robe rail, foot rest, pump, jack, tire outfit and tools. Trimmings, black and nickel. Five passenger, $2500.

Jackson "Majestic"—$1975

45 horsepower, unit power plant, four cylinder, long stroke motor, 4½ x 5¼ inches; 124-inch wheelbase; 36 x 4-inch tires. Full elliptic springs, front and rear. Deep, roomy body, with 10-inch upholstery. Electric starting and lighting system, dynamo and storage battery. Equipment of mohair top, top hood, ventilating windshield, speedometer, oil and gasoline gauges on dash, Firestone universal quick detachable rims, extra rim, tire carrier, electric horn, robe rail, foot rest, pump, tire outfit and tools. Black and nickel trimmings.

Jackson "Olympic"—$1500

35 horsepower, unit power plant, four cylinder, long stroke motor—4½ x 4¾ inches. 115-inch wheelbase; 34 x 4 inch tires. Full elliptic springs, front and rear. Deep roomy body, with 10-inch upholstery. Gasoline tank under dash, supplied from storage tank at the rear, with pressure pump. Total capacity, twenty gallons. Equipment includes Disco self-starter, mohair top, top hood, ventilating windshield, speedometer, oil and gasoline gauges on dash, Prest-O-Lite tank with automatic electric lighter; Firestone universal quick-detachable demountable rims, extra rim, tire carrier, robe rail, foot rest, pump, jack, tire outfit and tools. Trimmings, black and nickel.



"The Perfection of Electrics"

$2550
F.O.B. Detroit



MODEL B—FIVE PASSENGER BROUGHAM

The Century Electric Brougham
For 1913 Now Ready

The demand of the user is for a low-hung body—with a low center of gravity. The under-frame construction of the Century gives both—and with it high road clearance and correct distribution of weight. The illustration speaks for itself of Century beauty and style. No car at any price offers more real value. Immediate deliveries.

NOTE THESE SPECIFICATIONS:

BODY—Hammered Aluminum panels; selected hardwood frame; tilting glass front; upper half swings out, lower half slides down, door and rear window slide down; long running boards and extra wide doors.

BODY DIMENSIONS—Rear seat width 47", depth 21", cushion 8" thick; front seat width 44", depth 20", cushion 6" thick; knee room between seats 24"

UPHOLSTERING—Superfine imported broadcloth or hand buffed leather. Furnished in blue, green, brown or maroon. Bedford cords or fancy cloths.

PAINTING—Rich black frame work and mouldings with blue, green, brown or maroon panels to match upholstering.

WHEELBASE—98"; the most practical for easy riding and convenience in handling.

TREAD—Standard 56", road clearance 12"; providing absolute safety.

AXLES—Rear, full-floating, of the very latest type. Front, straight tubular. Axles mounted on imported ball bearings.

FRAME—Special straight design for under-frame construction.

BRAKES—Two 12 x 1¾ inches. Internal expanding on rear wheels.

SPRINGS—Semi-elliptic front; triple platform rear. Assuring easy riding qualities.

FENDERS—Full skirted metallic; giving absolute protection to body.

STEERING—Side lever; ball bearing; easy and safe.

CONTROLLER—Horizontal lever positively safe, arranged to allow full use of rear seat.

MOTOR—High efficiency type, extra large size, built especially for vehicle service by Westinghouse.

DRIVE—The motor is rigidly suspended to chassis sub-frame slightly forward of car center. Direct shaft drive to rear axle without reduction chains or gears. The best and most economical method of power transmission.

BATTERY—Exide 30 cells M. V. 13 plates as Standard Equipment.

MILEAGE—65 to 100 miles on a single charge.

SPEED—2 to 23 miles per hour.

TIRES—Optional 36 x 4 high efficiency Motz cushion, or 34 x 4 special electric pneumatic, nobby tread rear.

EQUIPMENT—Speedometer, volt-ammeter, side and tail lamps, electric bell, toilet case, watch, cut glass flower vase, complete outfit of tools, charging plug, etc.

Dealers—Is Your Territory Open?

We are now established in our new factory—and are going right ahead with manufacturing operations, with the result that from now on we will be able to guarantee immediate deliveries. Write at once for our proposition.

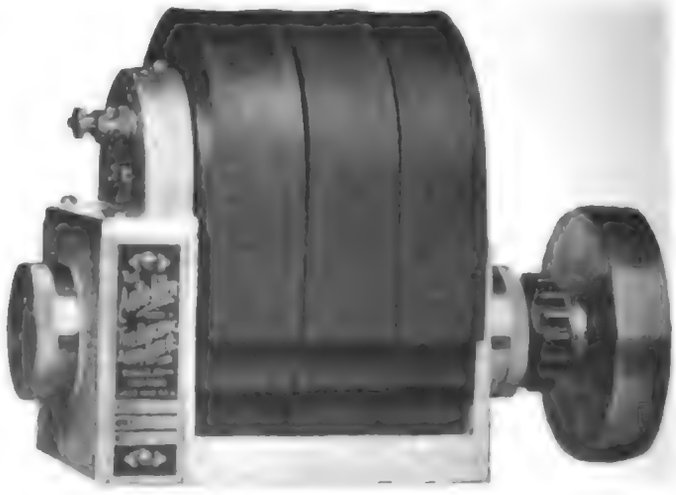
CENTURY ELECTRIC CAR COMPANY, Detroit, Michigan

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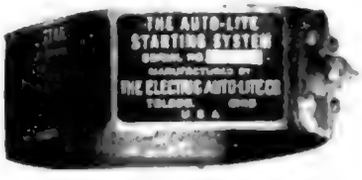
ELECTRIC STARTER

The Auto-Lite 6 Volt Electric Lighting and Starting System

EFFICIENT and SAFE



Has more torque and will crank your engine with more speed than any other system on the market of equal weight.





100 per cent. efficiency. Not a make shift for any car. But a distinctive application for each manufacturer, insuring positive results.

First—The system consists of a powerful 6 volt series wound motor.

Second—Of a simple lighting generator with large capacity. Of few parts and built rugged for automobile usage.

Third—A rugged simple starting switch operated by a foot pedal.

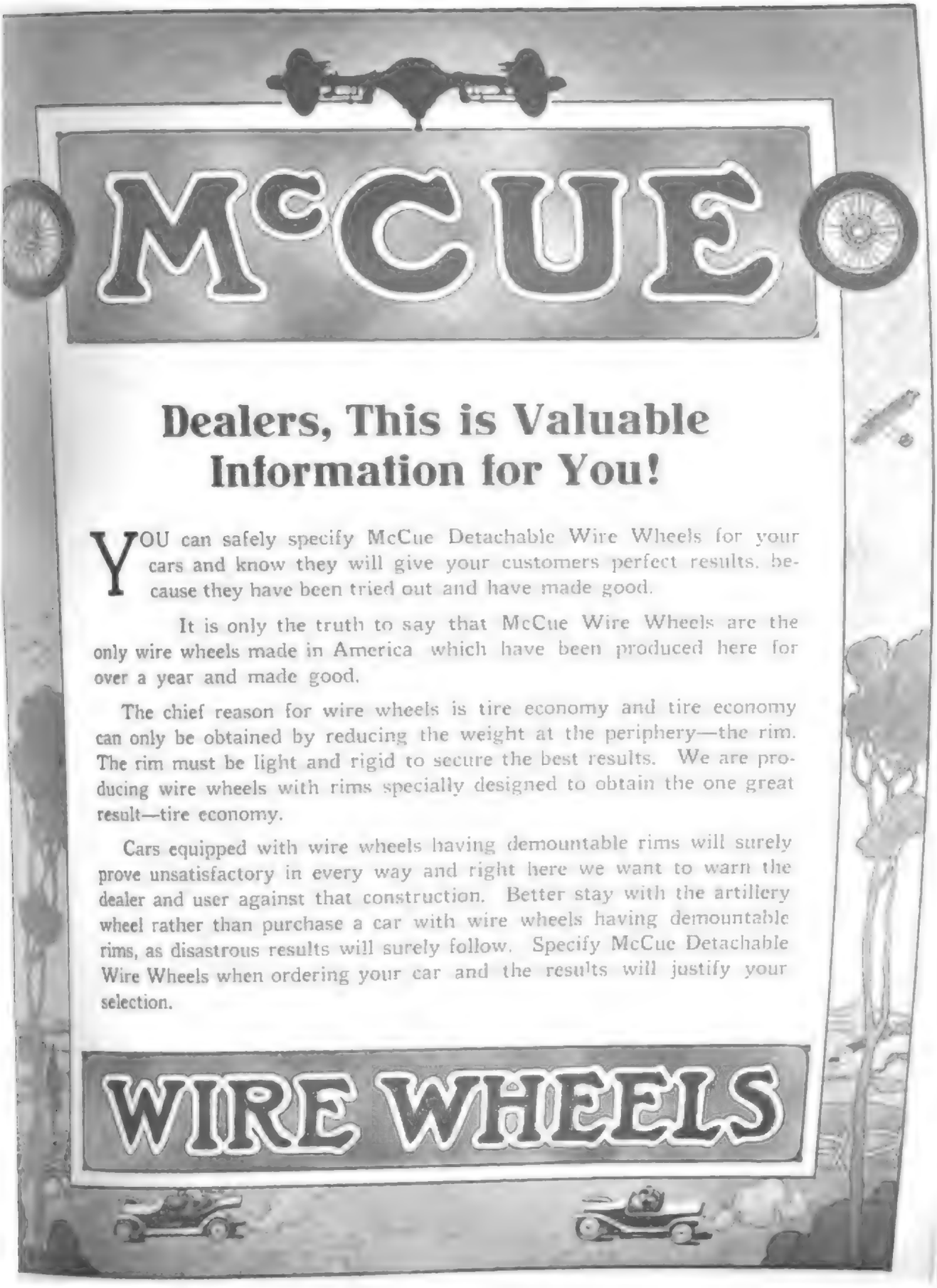
Fourth—An ammeter which shows both production and consumption of current.

This system is not an experiment as there are thousands in use. We guarantee deliveries, efficiency and service. Insist upon an Auto-Lite system on your car.

THE ELECTRIC AUTO-LITE CO.

Main Office and Factory, Toledo, Ohio

BRANCH OFFICES: New York Kansas City San Francisco



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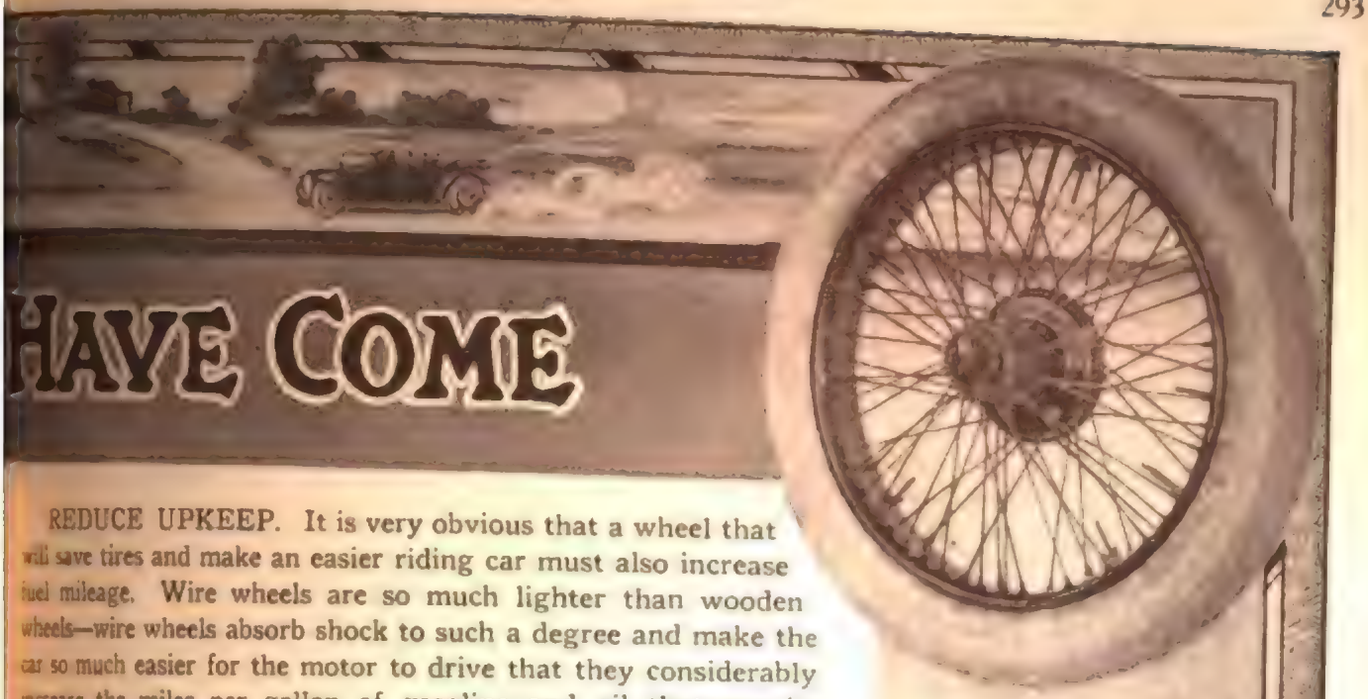
WIRE WHEEL

SAVE TIRES. Wire wheels have come into prominence solely because of their intrinsic merit. Principal among their advantages is the fact that they save tires. Actual test has shown wire wheels to increase the life of tires 68.75 per cent.

INCREASE COMFORT. Being suspension wheels and much lighter and more springy than any other wheels, wire wheels make the car much easier riding and much easier to drive. Anybody can tell by riding in a wire wheel equipped car that the car rides easier than it did with wooden wheels.

SAVE CAR ITSELF. By their light weight construction and springiness wire wheels absorb a large amount of shock that in other wheels is transmitted to the mechanism of the car to its detriment. In this way wire wheels actually increase the life of the car itself as well as the life of the tires. This, of course, means money in the owner's pocket, not alone in making the car last longer but in making the car easier to maintain.

McCUE



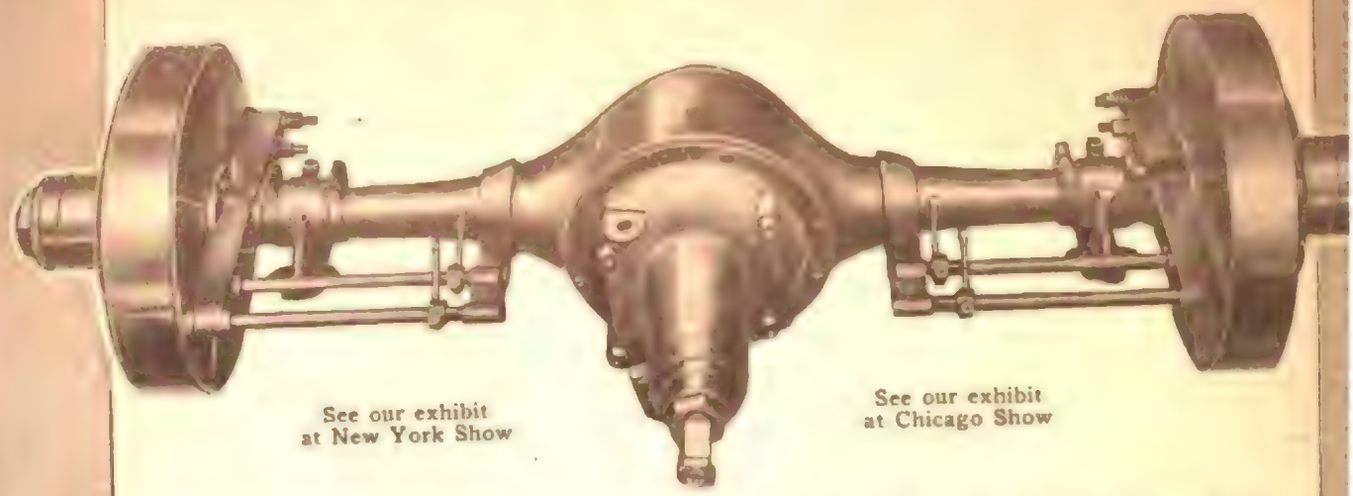
HAVE COME

REDUCE UPKEEP. It is very obvious that a wheel that will save tires and make an easier riding car must also increase fuel mileage. Wire wheels are so much lighter than wooden wheels—wire wheels absorb shock to such a degree and make the car so much easier for the motor to drive that they considerably increase the miles per gallon of gasoline and oil that can be obtained from the car.

SUPERIORITY DEMONSTRATED. All of these facts have been widely demonstrated during the past few years. Abroad all of the really good cars carry wire wheels and other types of wheels are really the exception. This applies not only to pleasure cars but to racing cars as well. In this respect it needs only to be cited that in the French Grand Prix over 85 per cent of the entries carried wire wheels. This race was won on wire wheels as have been nearly all the big races abroad in the past two or three years. In this country wire wheels for racing cars have proved out in great shape. Above it shown a photograph of a wheel and tire that went through both the Vanderbilt and Grand Prix at Milwaukee this fall on its original air and finished inside the money.

WIRE WHEELS AXLES

McCUE AXLES



See our exhibit at New York Show

See our exhibit at Chicago Show

The McCue Detachable Wire Wheel is the most flexible wire wheel made. It is the only wire wheel made in this country which has stood the hard racing tests and severe usage for a year past.

The wheel construction which we will furnish our trade on and after Feb. 1st, for 1913 cars, has been under the severest test for several months. And it has been perfected in those details which are so important in a new construction where sample work is necessarily made by hand to permit the hurried filling of sample orders. We have been making McCue Detachable Wire Wheels for automobiles for fifteen months and have a complete tool equipment for the production of a high class product.

We believe we are just one year ahead of any other American manufacturer and that they must go through the same experience we have. Even if they follow us they must still prove their construction. When copying our construction they will necessarily copy our mistakes the same as we did with the foreign construction.

The McCue Detachable Wire Wheels have arrived—the rim, the spoke and nipple, the detachable hub with the security lock have each had the most careful attention and each of these products has been perfected under tests much more severe than they will receive in ordinary usage, and all brought up to the McCue axle standard.

Send for "Mileage Plus."

THE McCUE COMPANY
BUFFALO, N. Y.

A Personal Invitation to *YOU!*

TO see Miller Tires and meet Miller Men at the New York Show, week of January 11-18.

Mr. Tire Dealer and Mr. Tire User—we want to know you ***both.*** Your interests are mutual. For that which is best for the Tire User is best for the Tire Dealer.

You will find us at Booth No. 549

We believe you will want to learn more about *MILLER ONE CURE, WRAPPED TREAD* method of building

Miller Tires

The greatest advance made in the construction of automobile tires in a decade—we believe. A method that is saving motorists thousands of dollars every day, by the elimination of tire troubles, caused by old processes of manufacture—we KNOW.

Miller Non-Skid Tires

Are built with a new tread design that not only prevents skidding but also retains the non-skid feature twice as long as ordinary treads.

Mr. Dealer

There are a few good cities in which we are not satisfactorily represented. If you're looking ahead, write us for our agency proposition. It's interesting and profitable. We'll be glad to talk it over at the show, too.



The Miller Rubber Company

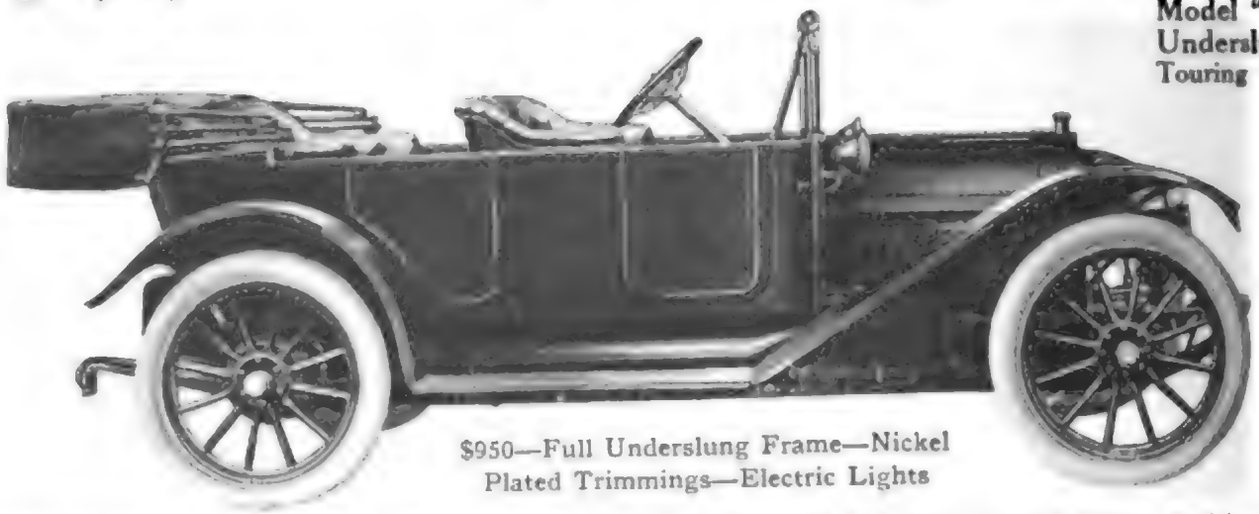
AKRON, OHIO

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Regal You Should See

At the New York Automobile Show,

Model "T"
Underslung
Touring Car



$950—Full Underslung Frame—Nickel Plated Trimmings—Electric Lights

Wheel base, 108 inches. Motor, four cylinders, cast en bloc; bore, 3¾ inches; stroke, 4½ inches; dual ignition; thermo-syphon cooling. Selective sliding gear transmission, three speeds forward and reverse. Tires, Morgan & Wright, 32 x 3½ inches. Equipment includes nickel-plated trimmings; demountable rims (one extra rim with each car); electric lights and storage battery, with option of gas headlights, oil side and tail lamps and Prest-O-Lite tank; electric horn; foot accelerator; tools and tire repair kit. Top, windshield and speedometer, $75 extra. **Price, $950.**

You should see these Regal cars and the Regal exhibit at the New York Automobile Show, January 11-25, 1913.

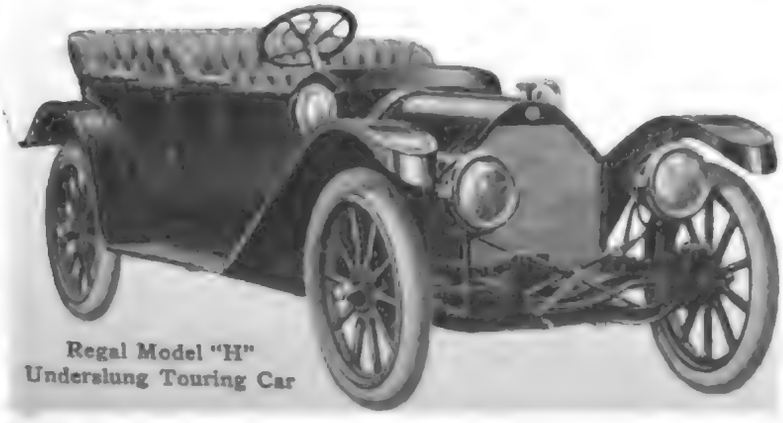
There will be other good exhibits and there will be other good cars, but the Regal display and the Regal cars will prove something new and something different.

One feature of this exhibit will be a chassis especially prepared to illustrate the essential differences of Underslung construction. We have arranged to offer each visitor at the show an opportunity to learn, first hand, the characteristics of this feature of Regal design. Whether you represent another line of cars, whether or not you are even selling cars, we want you to see this exhibit. You'll learn something new about an automobile that you did not know before.

The Regal Exhibit

The 1913 exhibit will be something new and different. No lover of a good motor car should miss it. See the Underslung Chassis.

In charge of the Regal booth will be a corps of attendants who know the details of Regal construction. They have seen the cars manufactured at our factory. The business of these men will be to explain where Regal cars are different and to answer such questions as you may desire to ask. No man will urge you to buy a Regal car. None of these men will urge you to sell Regal cars unless you



Regal Model "H"
Underslung Touring Car

Grand Central Palace, New York

January 11-25, Space 27

Regal Model "H" Specifications

Wheel base, 118 inches. Tires, Morgan & Wright, 34 x 4 inches. Selective sliding gear transmission, three speeds forward and reverse. Motor, four cylinders, cast in pairs; bore 4¼ inches; stroke, 4½ inches; dual ignition; thermo-syphon cooling. Equipment includes mohair top; top boot; windshield; speedometer; demountable rims (one extra rim with each car); electric lights and storage battery, with option of gas headlights, oil side and tail lamps and Prest-O-Lite tank; electric horn; foot accelerator; tools and tire repair kit. **Price, $1400.**

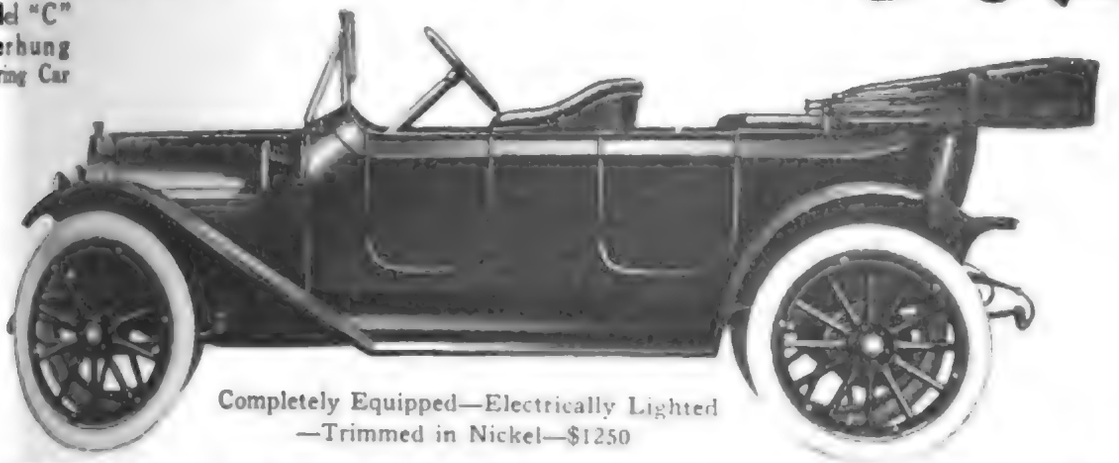
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These Regal Cars

Grand Central Palace, Space 27

Regal

Model "C"
Overhung
Touring Car



Completely Equipped—Electrically Lighted
—Trimmed in Nickel—$1250

Wheel base, 116 inches. Tires, Morgan & Wright, 34 x 4 inches. Selective sliding gear transmission, three speeds forward and reverse. Motor, four cylinders, cast en bloc; bore, 4 inches; stroke, 5 inches. Springs, three-quarter elliptic rear, semi-elliptic front. Body, latest English design with 2½ inch panel around top. Finish, dark blue with light blue striping and panel. Equipment includes mohair top, top boot, windshield, speedometer, demountable rims (one extra rim with each car); tire irons on back; robe rail; foot rail; electric lights and storage battery with option of gas headlights, oil side and tail lamps and Prest-O-Lite tank; electric horn; foot accelerator; tools and tire repair kit. **Price, $1250.**

Location of Booth

The Regal booth will be in Grand Central Palace, Space No. 27. All booths will be numbered and any attendant can direct you.

desire to know about our selling plan. If you are interested in our liberal dealer's proposition one of our sales experts from the factory will gladly explain it to you.

The line of Regal cars on exhibition at the New York show will be a complete line. Each car in the booth will be fitted with complete equipment and all of our models will be shown. The specifications included on these pages can give you only an incomplete idea of the unusual values we are offering. The cars themselves are our best argument. You should see these cars.

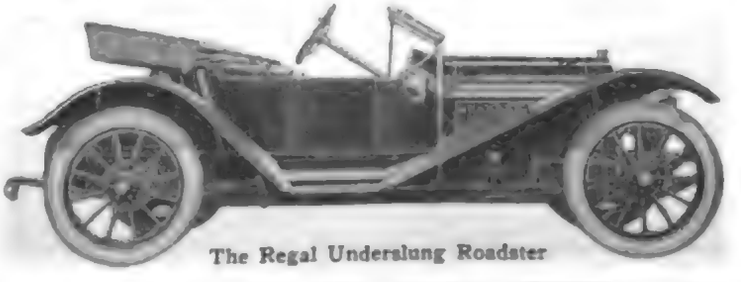
With the hundreds of new visitors to the Regal booth, there will come scores of Regal dealers and owners. Space No. 27 in Grand Central Palace will be a rendezvous for everybody interested in Regal cars. Announcements have even been sent to our dealers in California. We anticipate a big reunion and will be ready to extend a hearty welcome.

If you care to, we'll be glad to have you talk with other Regal dealers in attendance at the Regal booth. They can give an unbiased opinion of Regal cars. Each man has made a conscientious study of the best in automobile construction; each man knows the special merits of the cars he sells.

The Regal Motor Car Co., Automobile Manufacturers Detroit, Mich.

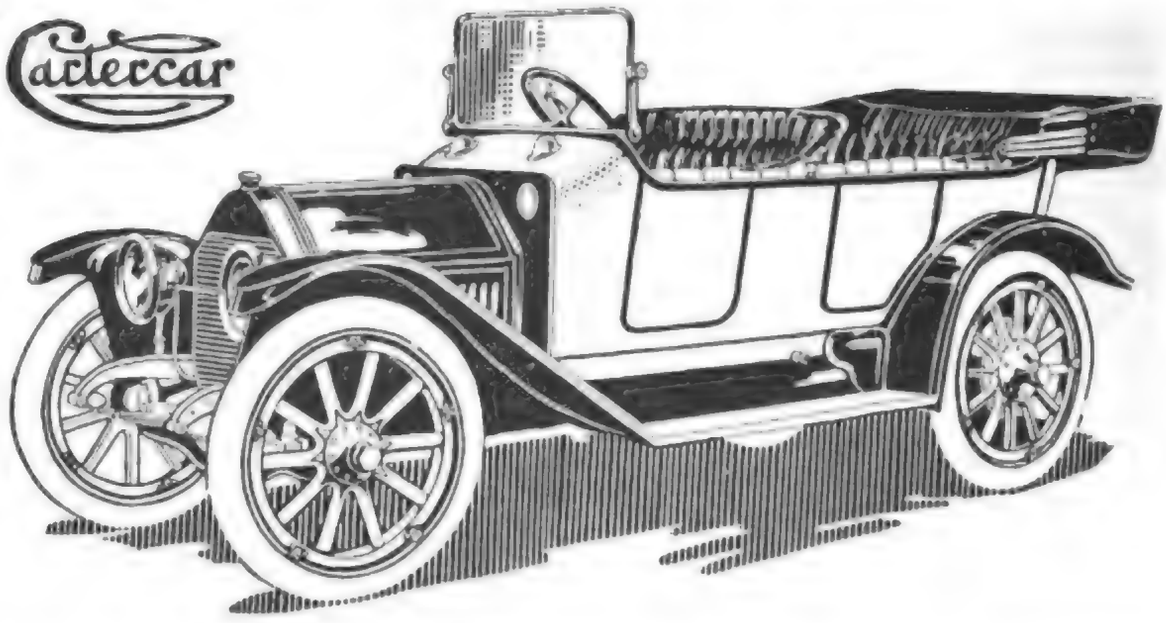
Regal Roadster Specifications

Motor, four cylinders, cast en bloc; bore, 3¼ inches; stroke, 4½ inches; dual ignition; thermo-syphon cooling. Selective sliding gear transmission, three speeds forward and reverse. Tires, Morgan & Wright, 32 x 3½ inches. Equipment includes nickel-plated trimmings; demountable rims, (one extra rim with each car); electric lights and storage battery, with option of gas headlights, oil side and tail lamps and Prest-O-Lite tank; electric horn; foot accelerator; tools and tire repair kit. Top, windshield and speedometer, $75 extra. **Price, $900.**



The Regal Underslung Roadster

The Car With The Gearless Transmission!



This is the car that will give you the best service under all conditions, because it is efficient and strong, just where the ordinary car is weak—in the transmission. Your Cartercar is reliable, simple to drive—and always ready to go on any road.

Greater Efficiency

A Cartercar has an unlimited number of speeds—one lever control—and will easily climb a 50% grade. The transmission is composed of only two unit parts—which must mean great reliability. Just think seriously over what these features will mean to you.

Greater Tire Mileage

The tires on your Cartercar will wear about twice as long as on the gear car. This is because the transmission eliminates all jerks and jars in starting and changing speeds.

Electric Starting

Whether the weather is warm or cold, all you have to do is merely to press down a small knob and the motor is cranked. Then turn this same knob and you light all or as many lamps as you wish.

Four Excellent Models

The new Cartercar line includes four extremely good models—Touring Car, Roadster, Coupe and Sedan. They are finished elegantly, deep upholstering and attractive lines. The prices are from $1600 to $2000.

At All the Big Shows

The new Cartercars will be shown at the big shows this winter. We will be glad to see you and will carefully explain the many advantages of this car. Or, if you cannot be at any of the shows write us for new catalog.

Cartercar Company

Pontiac, Michigan

BRANCHES: New York, Chicago, Detroit, Kansas City and Atlanta

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13,055 Magnetos Shipped in October *13,165 Magnetos Shipped in November*

1913 sees more Remy Magnetos in use than all others combined

MORE than three hundred of the most representative organizations in the entire automobile industry chose the Remy Magneto exclusively for 1913.

More than three hundred of the greatest engineers in the industry gave this action their stamp of approval.

More than ten thousand dealers were previously consulted by the manufacturers.

More than three hundred thousand satisfied users of Remy Magnetos during 15 years gave volume to this tidal wave of demand for the Remy Magneto for 1913.

And the many years of Remy success is emphasized in the 1913 season, when the greatest attention is being paid to choice of equipment.

Are these facts significant to you

The Remy Electric Company is the pioneer manufacturer of magnetos in this country—one of the first in the world.

It is the world's largest manufacturer of magnetos.

It created "Ignition Service."

We have more than fifty branches and service stations in North American motoring centers for intelligent service to Remy users.

More than 1,000 men are employed to build Remys.

This great force facilitates construction and deliveries with scientific, automatic, time-saving, accurate machines—protected by a fire-proof factory.

These men are electrical and mechanical experts drawn from every civilized country of the globe.

The Remy Electric Company has as a result of its tremendous volume greater buying facilities than any other ignition concern.

These facts, combined with the simplicity of the Remy construction, make it logical for the Remy Electric Company to offer the best motor car electrical equipment for the lowest legitimate cost.

See the Remy Electric

Starting, Lighting and Ignition Exhibit

Space 135, Madison Square Garden, New York Show

Remy Electric Company, Anderson, Indiana

Service Stations

Albuquerque, N. M.
Atlanta, Ga.
Baltimore, Md.
Boston, Mass.
Buffalo, N. Y.
Charlotte, N. C.
Cincinnati, Ohio
Cleveland, Ohio
Chicago, Ill.
Columbus, Ohio
Detroit, Mich.
Indianapolis, Ind.
New York City, N. Y.
Kansas City, Mo.
San Francisco, Cal.
Dallas, Texas.
Denver, Colo.
El Paso, Texas.
Grand Rapids, Mich.
Houston, Texas.
Jacksonville Fla.
Los Angeles, Calif.
Louisville, Ky.
Memphis, Tenn.
Milwaukee, Wis.
Minneapolis, Minn.
Nashville, Tenn.
New Orleans, La.
Norfolk, Va.
Omaha, Neb.
Philadelphia, Pa.
Pittsburgh, Pa.
Portland, Me.
Portland, Ore.
Providence, R. I.
Rochester, N. Y.
San Antonio, Texas.
Savannah, Ga.
Seattle, Wash.
Spokane, Wash.
St. Louis, Mo.
Utica, N. Y.
Washington, D. C.

Canada: Vancouver, B. C.; Calgary, Alberta; Montreal, Que.; Winnipeg, Man.; Hamilton, Ont.; Toronto, Ont.

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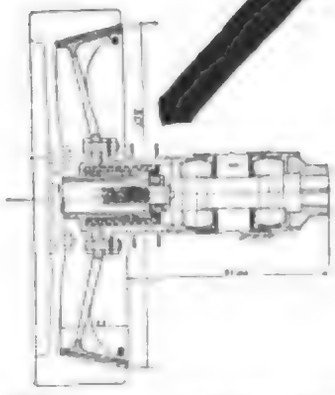
A Message to Assemblers

in Small or Large Lots

Let Us Furnish Your Cone Clutches, Joints, Rocker Shafts, Control Sets

In offering these assemblies to the trade, we do so with the full knowledge that the designs are standard, containing not a single untried feature and following along the lines used by the most successful car builders.

Special attention has been given to the selection of material best suited to withstand the wear occurring to the individual parts; and letters received from customers, covering service during the season just ending, indicate that our efforts have not been wasted.



P-40 Cone Clutch

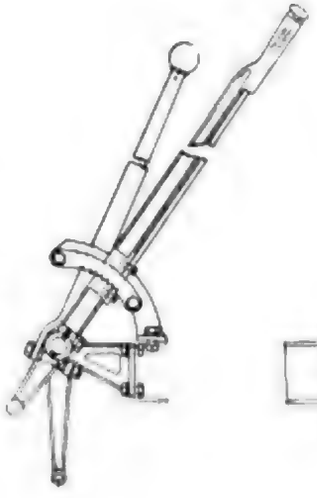
Cone is aluminum and has face machined after leather is riveted on, giving absolute fit in fly wheel. This feature and the special springs under leather insure easy engagement and long life.

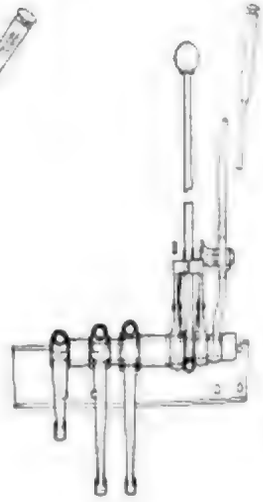
Will furnish either bronze or ball bearing throw-out yoke.

This type also supplied for 30 H. P. cars.

Type "C" Control

Designed for center control. General dimensions can be changed to suit special requirements. This type also made with gear shifting lever only, when both pedals are used to operate the brakes.

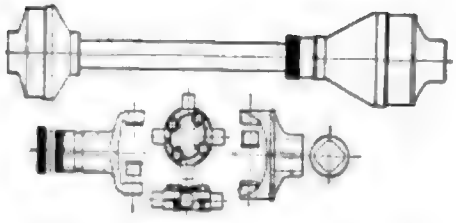




The Otto Konigslow Mfg Co.
Cleveland.

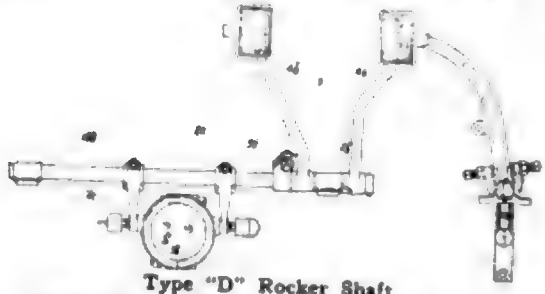
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Truck and Pleasure Cars



P-30 Drive

Furnished as shown or joints only. Forgings are special analysis steel heat-treated and accurately machined. Note simplicity of design



Type "D" Rocker Shaft

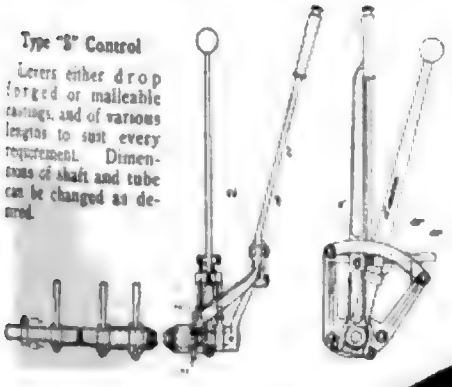
Furnished complete with pedals for brake and clutch. Throw-out yoke either bronze or ball bearing. Have a variety of styles of pedals both malleable castings and drop forged with separate pads, to suit special requirements.

We wish to especially emphasize the point that you are not restricted to dimensions as here shown. Send us your blue prints, or rough sketches will do, giving the essential dimensions; also advise whether interested in quantities or samples only.

Considering design and workmanship, our prices will be found surprisingly low.

Type "S" Control

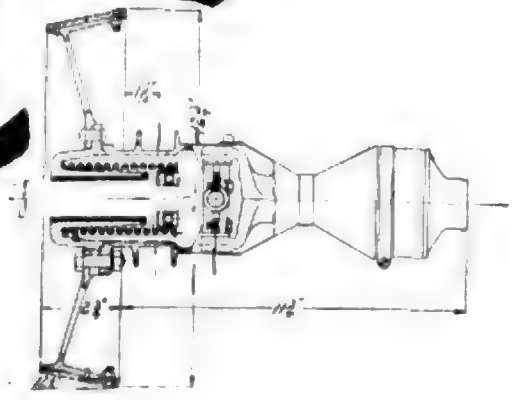
Levers either drop forged or malleable castings, and of various lengths to suit every requirement. Dimensions of shaft and tube can be changed as desired.



U-30 Cone Clutch

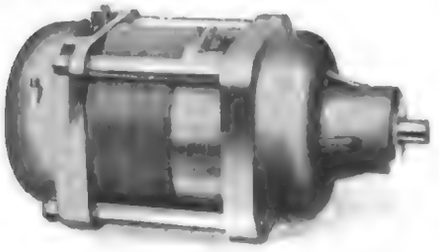
In this type standard double joints are used in place of sliding blocks. Can also furnish with single universal and extended shaft if desired.

Fitted with either bronze or ball bearing throw-out yoke.

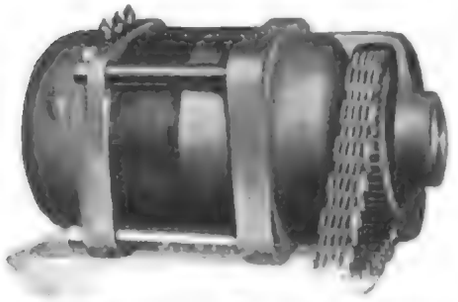


The Otto Konigslow Mfg Co.
Cleveland.

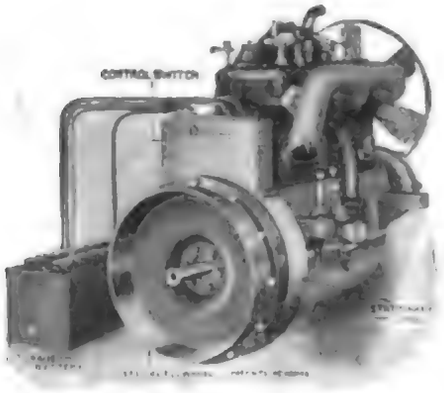
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APLCO Model A-7 Electric Engine Starter



APLCO Model A-7½ Electric Engine Starter



APLCO Flywheel Starter

APLCO Electric Engine Starters

The Simple and Foolproof Systems

Designed by V. G. Apple, the man who made the first dynamo for an automobile, the first electric lighting system for an automobile and the first electric engine starter (1900).

Not An Experiment But a Fully Developed Success

The Models A-7 and A-7½ having withstood a year of severest test in actual service can be depended upon to perform their functions with certainty and absolute reliability.

The Aplco System Is Not a Makeshift

Not so delicate in construction that the possibility of its not working has to be provided for with elaborate care. It is not necessary to have an army of engineers following these equipments about. The Aplco Electric Engine Starters are as dependable as the engine in your car and are ready to give service any hour in the twenty-four and in any kind of weather.

Note the Clean Cut Lines of the Aplco Models

They are three unit systems—Dynamo-Motor, Controller and Storage Battery. No additional apparatus necessary and they combine in one system every electrical function required on an automobile. Controlled by a system of regulation so simple a child can operate it.

See these three systems at our NEW YORK STORE, 20 VESEY ST., during the New York Show---1508 MICHIGAN AVE., during the Chicago Show.

The Aplco Flywheel Starter Will Be There

in operation on an automobile engine. This is the greatest engineering triumph of automobile history. It absolutely eliminates all gearing, clutches and extra bearings. Has just two parts, one attached to your engine crank case, the other bolted to your flywheel. No elaborate changes necessary to install. No complications. Not necessary to make a gear out of your flywheel. All three models can be seen at our New York and Chicago stores as well as the Aplco Electric Lighting Systems.

The Apple Electric Company

An Ohio Corporation. Capital $300,000 fully paid.

20 Vesey Street, New York *1508 Michigan Avenue, Chicago*

Factory and Home Office, Dayton, Ohio, U. S. A.

We are ready for your business.



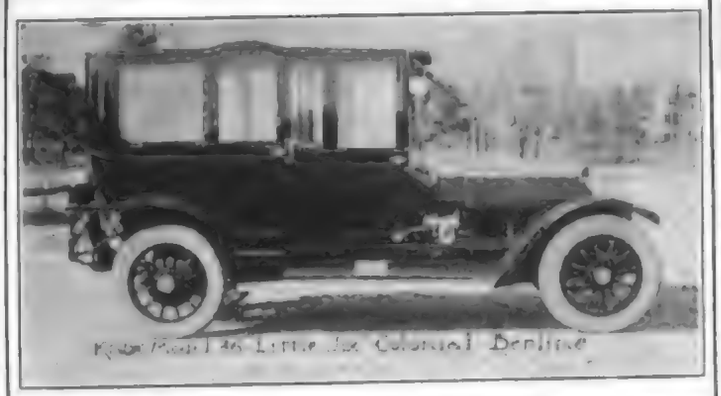
The Aplco Factory, Dayton, Ohio. Capacity 200 Lighting and Starting Systems daily.

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VEHICLES

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THE Knox COMMERCIAL

THE well-established reputation of Knox Pleasure and Commercial vehicles requires little or no argument here to those discriminating motorists who appreciate the value of cars of sterling worth and acknowledged reputation.

It is our intention in these pages to give a few condensed facts covering several of the more important Knox pleasure and commercial models.

Knox "Little Six" Model 46

A medium type six-cylinder car designed to meet the requirements of automobile enthusiasts who desire a trim, handsome six of reasonable capacity —a car with sufficient power and flexibility to serve in both town and country.

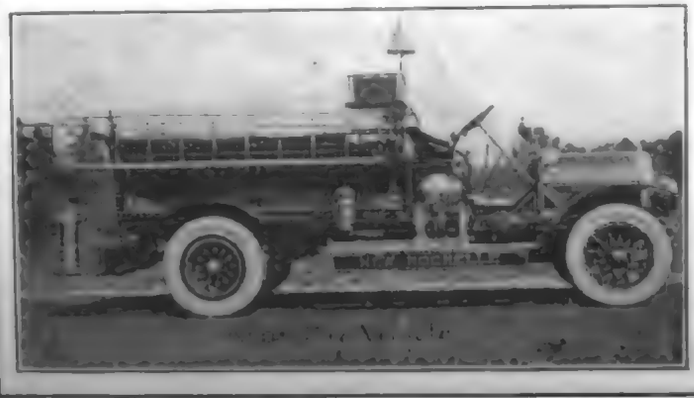
This model embodies the best features of approved European and American design, while retaining the vital characteristics of Knox construction, founded upon years of careful test and ripe experience. It is pre-eminently a model of rare distinction and exceptional merit.

Knox Closed Cars

These cars will stand the supreme test for silence which the closed type of body imposes, due to its tendency to increase the intensity of vibration, noise and rattle. The Knox chassis are ideal for closed car service on account of their reliability and the power, flexibility and silence of the Knox type of motor.

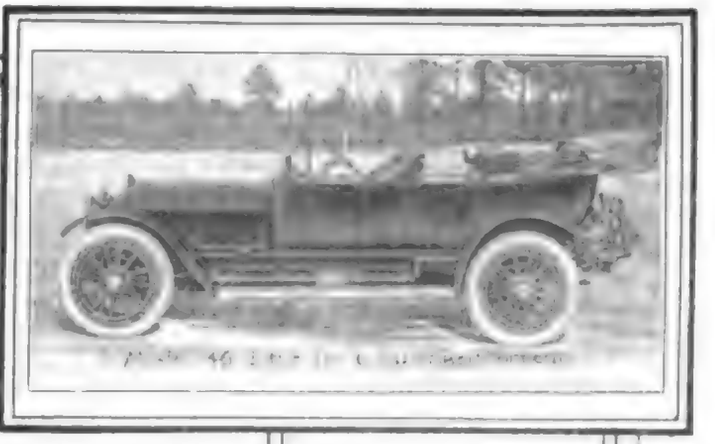
Knox Commercial Vehicles

We show here the Knox Martin Tractor, considered by experts to be the most practical and efficient means of transporting freight by motive power on the highway. It is particularly adapted for the transportation of coal, lumber and kindred lines, on account of the convenience with which trailer bodies can be interchanged on it, thus enabling the Tractor to be kept constantly at work with a high earning capacity.



KNOX AUTOMOBILE C
New York C
BRANCHES 1960 Broa

LINE OF PLEASURE VEHICLES



The unique arrangement of this Tractor permits the larger part of the load to be carried on steel tires, with a consequent material saving in upkeep cost, as well as affording complete accessibility to all vital parts and a more perfect road flexibility than is possible with the conventional motor truck.

Knox Fire and Civic Vehicles

Knox motor driven fire apparatus and civic vehicles have made an international reputation for reliability and service and are now found as standard equipment in some of the best and most up-to-date municipal departments of the United States as well as in several foreign countries.

The reliability, economy and speed of response made possible through the use of Fire and Civic apparatus of the Knox type is promoting a rapid and nation wide change to motor driven equipment.

STANDARD PLEASURE CAR EQUIPMENT

FOLDING TONNEAU SEATS—Extra folding seats with spring cushions are provided in seven-passenger types.

TOP—Knox artificial leather or mohair, unlined, with storm curtains and dust-cover included.

WINDSHIELD—Single folding type with double adjustment of upper glass.

LIGHTING—Four-cylinder models have combination oil and electric side and tail lamps with current from storage battery; gas headlights with electric sparker and Prest-O-Lite tank. Six-cylinder models have Berdon dynamo lighting system with electric head, side and tail lamps and storage battery auxiliary.

STARTER—Electric, of special Knox design.

RIMS—Fisk removable rims for bolted-on tires or universal Q. D. demountable, including one extra rim.

TIRE PUMP — Compressed air pump driven by the motor.

SPECIAL HORN—Combination Klaxonette and Reed Horn

SPEEDOMETER AND CLOCK — Mounted on dash shield for convenient observation from both front and rear seats.

TIRE CARRIER AND BAGGAGE RACK—Option on horizontal metal tire trunk for one tire with permanent rack or vertical carrier for two tires with folding rack; both located at the rear

COMPLETE TOOL EQUIPMENT — Including also jack, hand tire pump and tire repair kit.

ROBE RAIL AND FOOT REST

Ask for "Knox Knowledge"

SPRINGFIELD, MASS.
Chicago, Ill.
Michigan Ave.
AGENCIES IN PRINCIPAL CITIES



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Knox
MOTOR
VEHICLES
DISTINCTIVE
CARS OF
EXCEPTIONAL MERIT



Church-Field Brougham

Church-Field Electric

The Church-Field Electric combines the convenience, the simplicity of operation, the economy and the elegance of the electric vehicle with the perfect control, the power, the reliability and the general efficiency of the gasoline motor car.

It is pre-eminently the car of the discriminating man or woman who demands that the family conveyances be expressive of personality and place in the community.

The Church-Field is the only electric car that has a two speed planetary transmission.

This means an enormous saving in the cost of maintenance, because it minimizes the wear and tear on the batteries and the consumption of current.

Furthermore it places the Church-Field on the same footing with the gasoline car in climbing hills—the crucial test of power.

In a few words, the Church-Field is the electric of most power, the most perfect control—the most elegant—and distinctive.

To convince you of this, we only ask that we be allowed to demonstrate the Church-Field to you.

CHURCH-FIELD MOTOR CO., Sibley, Mich.

A Few Church-Field Electric Features

Ten point-speed control.

Two-speed Planetary Transmission.

Specially designed and patented springs.

Specially manufactured motor with 75 to 100 per cent more power than those used in most electrics of similar type.

Body is low, underslung, preventing skidding and permitting easy entrance and exit.



Church-Field Roadster

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PATHFINDER "40"



PATHFINDER CRUISER
40 horse power 120-inch wheel base

THE composite artistic design, quality workmanship and quality materials in the Pathfinder "40" really answers your insistent demand for distinction, efficiency and length of service.

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a master stroke of engineering genius that awaits your enthusiastic approval at the New York Show

Chicago
First Regiment
Armory

America's Greatest Endurance Car



THE **PATHFINDER "40"** represents the most notable engineering achievements in the building of motor cars. The *chassis* has been pronounced the greatest advance in scientific construction. Our *electric self-starter* is simple and accessible—it appeals to the man who is car-wise because it is easily operated and does not complicate ignition.

The *Pathfinder Cruiser* is the latest example of the fine workmanship and unique design that characterizes all Pathfinder cars—these qualities have placed the Pathfinder in a class by itself. Share in the benefits that come from such genuine leadership—write for our "101 Reasons." They will help you to judge the efficiency of any car.

Address:

THE MOTOR CAR MFG. CO.

INDIANAPOLIS

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No more Punctures Use AIREASE

AT LAST the Solution of the Tire Expense Problem Has Been Solved---

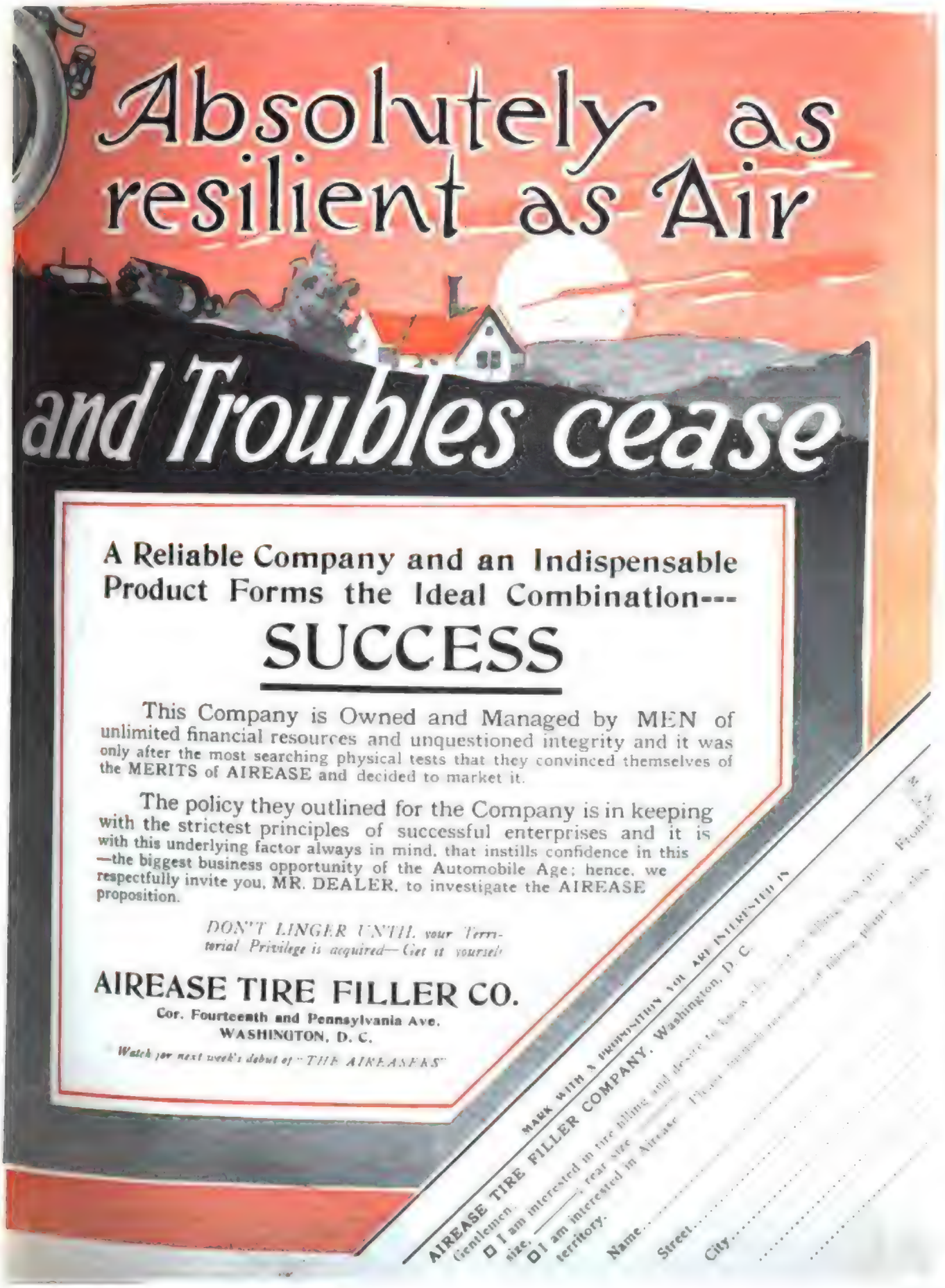
AIREASE

WE KNOW that AIREASE is a wonderful discovery and we want the Motoring Fraternity to know it and participate in this most remarkable invention; hence, we are inaugurating a stupendous National Advertising Campaign in keeping with it.

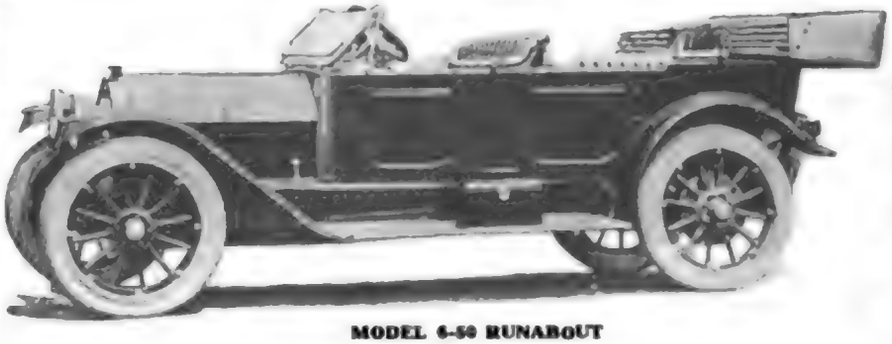
UNLIKE other attempts in this direction, we do not claim AIREASE a "cure-all" for eliminating tire troubles and expense; but we do make the unqualified claim that AIREASE is the ONLY SUBSTITUTE for air in tires that will not injure the tire and absolutely rides as easy as air and will stand-up under all conditions without disintegrating, solidifying or shrinking; and, also, that AIREASE contains no acids, glue or other substances so injurious to rubber.

AIREASE is a SURE SELLER and every sale will increase the demand; hence, to meet this demand, we must have representative men throughout the Country with Territorial Rights to sell AIREASE—the most wonderful invention since the automobile arrived.

ARE YOU THE MAN? If so, there is no time like the present to knock at the AIREASE door of opportunity


Absolutely as resilient as Air
and Troubles cease
A Reliable Company and an Indispensable Product Forms the Ideal Combination---
SUCCESS
This Company is Owned and Managed by MEN of unlimited financial resources and unquestioned integrity and it was only after the most searching physical tests that they convinced themselves of the MERITS of AIREASE and decided to market it.
The policy they outlined for the Company is in keeping with the strictest principles of successful enterprises and it is with this underlying factor always in mind, that instills confidence in this —the biggest business opportunity of the Automobile Age; hence, we respectfully invite you, MR. DEALER, to investigate the AIREASE proposition.
DON'T LINGER UNTIL your Territorial Privilege is acquired—Get it yourself
AIREASE TIRE FILLER CO.
Cor. Fourteenth and Pennsylvania Ave.
WASHINGTON, D. C.
Watch for next week's debut of "THE AIREASERS"
MARK WITH X PROPOSITION YOU ARE INTERESTED IN
AIREASE TIRE FILLER COMPANY, Washington, D. C.
Gentlemen:
☐ I am interested in tire filling and desire to have a ... of Airease ... From ...
size, ... rear size ...
☐ I am interested in Airease ... Please ... of these ... plant in this ...
territory.
Name ...
Street ...
City ...

KLINE KAR GET THE BEST



MODEL 6-50 RUNABOUT

See the Car at the Show Space No. 13 In the Palace

Mr. Dealer, here is a car, the Kline Kar, which you cannot ignore when you visit the show. We have arranged to exhibit all of our models in the Grand Central Palace, New York City, and at that time will be able to make you a proposition that will enable you to go into the open market and sell our product with profit to yourself and to us.

Series A Kline Kars embody features that make them the ideal medium priced automobile. Wheel bases have been lengthened, valve springs enclosed, auxiliaries added to the rear springs, tire sizes increased, upholstery made deep and luxurious, body room increased and the general body lines made even more beautiful than heretofore.

No matter what your requirements, we have the car you want.

Prices, $1,850 to $3,500 (FULLY EQUIPPED)

Kline Motor Car Corporation

Main Office and Factory, Richmond, Va. **Branch, York, Pa.**

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Edelmann Economy Gauge Enjoined

Twitchell Patent Again Sustained

Injunction Issued in Favor of

A. SCHRADER'S SON, Inc.

Notice Is Hereby Given to the Trade That:

In a suit brought in Chicago by A. Schrader's Son, Inc., against E. Edelmann & Co., makers of the Edelmann Economy Tire Pressure Gauge, for infringement of Twitchell patent No. 927,298, Judge Humphreys of the U. S. District Court for the Northern District of Illinois, on December 18, 1912, issued a preliminary injunction restraining E. Edelmann & Co. from the manufacture, sale and use of the Edelmann Economy Gauge.

This injunction, which was granted despite vigorous opposition by E. Edelmann & Co., is the last of an unbroken series of victories for the Twitchell patent and sustains the contention of A. Schrader's Son, Inc., sole owner of the Twitchell patent and all rights thereunder, that this patent covers all pencil type gauges now on the market.

The Schrader Tire Pressure Gauge is ABSOLUTELY ACCURATE

Ask Your Tire Maker

The following gauges have been held by the courts to be infringements of the Twitchell patent:

The Northam Gauge—held to be an infringement by the U. S. District Court for the Southern District of California in the suit of Chas. R. Twitchell vs. Northam Auto Pressure Gauge Co.

The Prest-O-Lite Gauge—held to be an infringement in the suit of Chas. R. Twitchell vs. Prest-O-Lite Company in the Southern District of New York.

The Safety Tire Gauge—held to be an infringement by the Supreme Court of the District of Columbia in the suit of Chas. R. Twitchell vs. Rudolph & West Company.

Furthermore, in the suit against the New York Sporting Goods Co. the sale of the Edelmann Economy Gauge was enjoined.

All other infringers will be promptly prosecuted.

The only gauges licensed for use or sale under the Twitchell patent are the Schrader Universal Tire Pressure Gauge, the Twitchell Tire Pressure Gauge and the Allen Tyrometer.

The trade is warned that the sale or use of the Edelmann Economy gauge or other infringing gauges is as much an infringement of the Twitchell patent as the manufacture of the gauges themselves.

Consequently jobbers and dealers handling infringing gauges are liable to injunction and damages.

Schrader gauges may be obtained for $1.00 from all tire manufacturers, jobbers, supply dealers, garages, or from

A. SCHRADER'S SON, Inc.

28-32 Rose Street NEW YORK

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A Great Car At the Big Shows

Plan to spend a good share of your time at the New York Show or the Chicago Show witnessing the special demonstration of the Dreadnought Moline M-40 five passenger touring car and two passenger roadster. When you are thoroughly informed as to these superb cars —see everything else and make comparisons. Make our booth your headquarters. Look for the

Dreadnought Moline M-40

Electric Self-Starter---Electric Lights

Completely Equipped, $1,950

At the New York Automobile Show, Madison Square Garden, January 11 to 18, 1913
At the Chicago Automobile Show, Coliseum, February 1 to 8, 1913

This famous car holds unapproached world's reliability records. Won in the classic Chicago Reliability Run 1910, 1911 and 1912. A superb car. A car with a pedigree. A car you will be proud to ride in, and happy to drive. Its owners place every confidence in the ample power of the famous Dreadnought Moline Long Stroke Motor—its passengers enjoy the highest degree of luxury and convenience. Sturdy and reliable over the roughest country going, its flexibility makes it ideal for crowded city traffic. It has power and endurance for touring —beauty and style for the boulevards. In every sense of the word—a superb car.

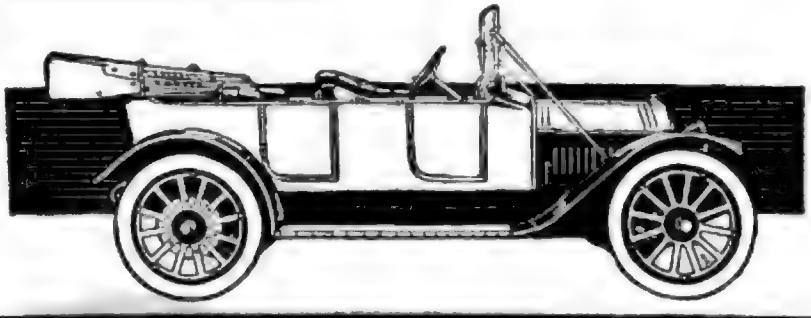
On its 124 inches of wheel base rests as great car value as you will find in America. To prove to yourself this statement we ask you to read the following list of

Over a Score of Added Features

10 inches added wheel base (now 124 inches)
Ward Leonard Electric Self-Starter and Electric Lighting System
5 more horsepower
Improved Steering Gear
Gasoline tank under cowl—
Indicator and filler on dash
Inside control
Ten inch upholstery
Turkish spring cushions
Flush side bodies
Nickel trimmings
Long stroke motor, 40 H. P.
Enlarged brakes
Improved springs
Large wheels and tires
Exceptionally roomy body
Demountable rims (set of 5)
Double independent ignition system
Carburetor dash air control
Rain vision wind shield
Moline silk mohair top
Speedometer
Completely equipped

We invite the closest scrutiny—the most careful comparison of values. Winning every Reliability event entered in 1911 and 1912, the Dreadnought Moline with its Long Stroke Motor, is rightly considered "One of the Most Reliable Cars in America." See the car itself at the New York Show—Jan. 11 to 25, 1913; or the Chicago Show, Feb. 1 to 15, 1913.

We have some live and interested territory for high-class progressive dealers only. If you can qualify write us on your business stationery. We will reply personally and confidentially. Handsomely printed informative literature on request.



Moline Automobile Company

107 Keokuk St. East Moline, Ill.

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Walpole "NO STONE BRUISE" Tires



WE BACK OUR DEALERS WITH A 4000 MILE GUARANTEE

Walpole SERVICE MEANS JUST THIS—

Tires built expressly for those who use the best—tires which you, Mr. Dealer, ***can recommend and sell,*** backed by definite mileage guarantee that must make good. The standard set by this company is high. Its basis is the conservation of the car owner's satisfaction. Service and quantity of production at the expense of quality has never had a place in this organization. Such combination is impossible. Walpole tires are built and cured as a unit. Each tire represents a certain and definite amount of personal, individual work, which must, of necessity, preclude defects of any character. Couple these methods of manufacture with the ***highest grade rubber and fabric the markets afford***—add to this combination, ***rigid, thorough, individual inspection through every process of construction*** and you can, Mr. Dealer, guarantee to your trade that when a Walpole tire leaves this factory it is as near perfect as workmanship, facilities and quality of materials can make it.





When you recommend Walpole tires you do it with confidence inspired by the policy of this company and to back this up we will protect you in the guarantee that each Walpole tire is guaranteed against stone bruise for four thousand miles' service.

We will exhibit at the Madison Square Garden Show, New York, in SPACE 232, BALCONY

DEALERS — BAD TIRES NEVER MADE GOOD BUSINESS

Your own best business instinct most certainly dictates the handling of good tires. Dealers who care more for an upbuilding of business for the future ***will not and do not*** recommend or sell tires of doubtful worth. Such policy is a big factor in the commission of slow business suicide.

It is potent to those in the trade and to car owners with tire experience back of them, that tire upkeep is one bugbear militating against more and better automobile sales. It is the unreliability of the average run of well named "cheap" tires that has done much to discourage the purchase of cars by those who could well afford to pay for them but who fear the uncalled for item of expense —tire upkeep.





We know that Walpole tires are inspiring confidence and creating sales wherever they are introduced. We know that Walpole dealers are keeping friends and making more friends through their sales.

In the production of well made tires, the interests of the car manufacturer, the tire manufacturer and the dealer are identical. And so we come to you with confidence, inspired by the quality of our products, and ask you to investigate them. To understand in full the "whys and wherefores" back of their production. With the facts in your possession you will become a friend and customer and you will recommend these tires to your manufacturer as part of a standard equipment.

We will exhibit at the Coliseum Show, Chicago in SPACES 196 and 197, IN THE BALCONY

Walpole "NO STONE BRUISE" Tires



THE WALPOLE FACTORY

at Foxboro, Mass., in size and equipment well qualified to produce **Quality** Tires, through personal work on each tire that warrants a 4,000 mile guarantee—our guarantee to dealers; theirs to car owners.

Walpole Tire & Rubber Company

Sales Offices

757 Boylston St. **Boston, Mass.**

We Grind and Machine Crankshafts Exclusively

We can grind anything from a motorcycle crank up to a six-throw automobile crank

Been grinding and machining crankshafts for over seven years. Doing work for some of the best and biggest concerns in the Automobile industry.

Incidentally we have developed one of the most complete and thoroughly organized plants of its kind in the world.

In Our Lathe Department we have a very complete equipment of special crank-turning lathes and heavy-duty engine lathes, all fitted with the best tools for this class of work.

Our Grinding Department is as complete as we know how to make it. We use modern methods and the latest improved crank pin and plain grinders which are constantly tested for accuracy by experienced men.

Our Finishing Department is equipped with machinery especially designed for accuracy and speed on turning gear fits, cutting tapers, threading, drilling flanges and oil holes, cutting key-ways, etc. All our work is carefully inspected after each operation and finished work is inspected twice before shipping.

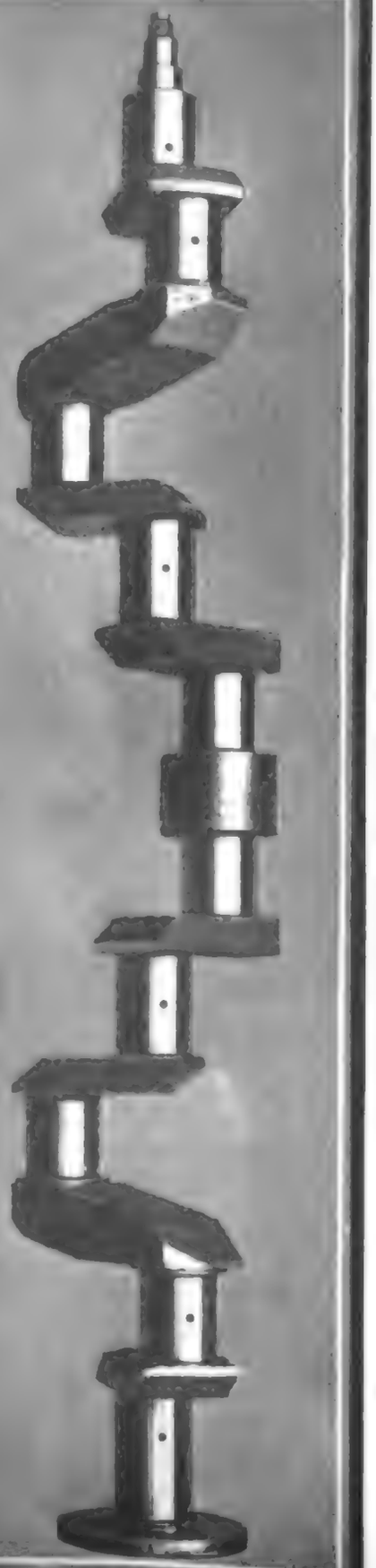
Our Tool Room equipment has been carefully selected with a view to close work on jigs, gauges, and all necessary tools for our shop.

We Have Made a Specialty of machining and grinding crank shafts for over seven years, and our constantly increasing business is a good indication that we know how to make good cranks.

Our little brochure—"A Modern Crankshaft Factory," sent on request, gives interesting details of our equipment and facilities. Get in touch with us.

Auto Crankshaft Company

200 Piquette Avenue, Detroit, Mich



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Dealers

For Unique Accuracy
Superior Hardness
Tensile Strength

The World Moves Easier
When Mounted On
R·I·V BALLBEARINGS



Conservative Manufacturers Use R.I.V. Bearings
You Ought To Recommend Them



¶The physical characteristics of R. I. V. Bearings warrant well the statement that they **cost** more because they are **worth** more. ¶Now, it is patent that the manufacturer who buys one quality part (and pays a quality price) usually builds a car of worth all the way through. ¶But R. I. V. service does not stop with the mechanical completion of perfect bearings. Its engineering department co-operates with car designers and to such, our specialized knowledge is of more than ordinary value, for the proper designing of bearings for a particular car is equally important with the right selection of springs. axles and other major parts in which load, thrust and other problems must be figured out and acted upon. In this we work in harmony with the men who make the cars. ¶With such quality and policy back of R. I. V. Bearings, the best service you can render the prospective buyer, is to **recommend** R. I. V. Bearings to him and to **expect** them on the cars you sell.

R. I. V. COMPANY, 1171 Broadway, New York





This factory has manufactured over 1,000,000 Automobile Gears during the past three years

This big demand for "Grant-Lees" Gears is a plain case of "survival of the fittest." Through years of ordinary and unusual service in the mechanism of hundreds of thousands of automobiles, they have proved the most durable and longest lived. And to no little extent is this durability due to the fact that

Our Factory Is Equipped Most Efficiently

Upon the heat treatment, for instance, depends the toughness, the wearing qualities, the life of the gear.

Our heat treating department is equipped with the most accurate machines for measuring heat that science has produced.

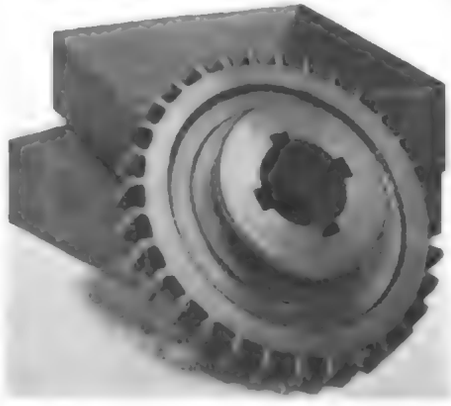
Automatic Control of Heat

The heat of our furnaces are maintained to a uniform degree by automatic pyrometers.

To be doubly certain, the exact heat is constantly shown, day and night, on a recording pyrometer in the office of our factory manager.

Toughening and Testing of Steel

The steel in every Grant-Lees Gear is analyzed—made tough, elastic and durable. After every gear is finished the proper depth of case and hardness is proven by our special method.



We Pack Our Gears Like Ball Bearings

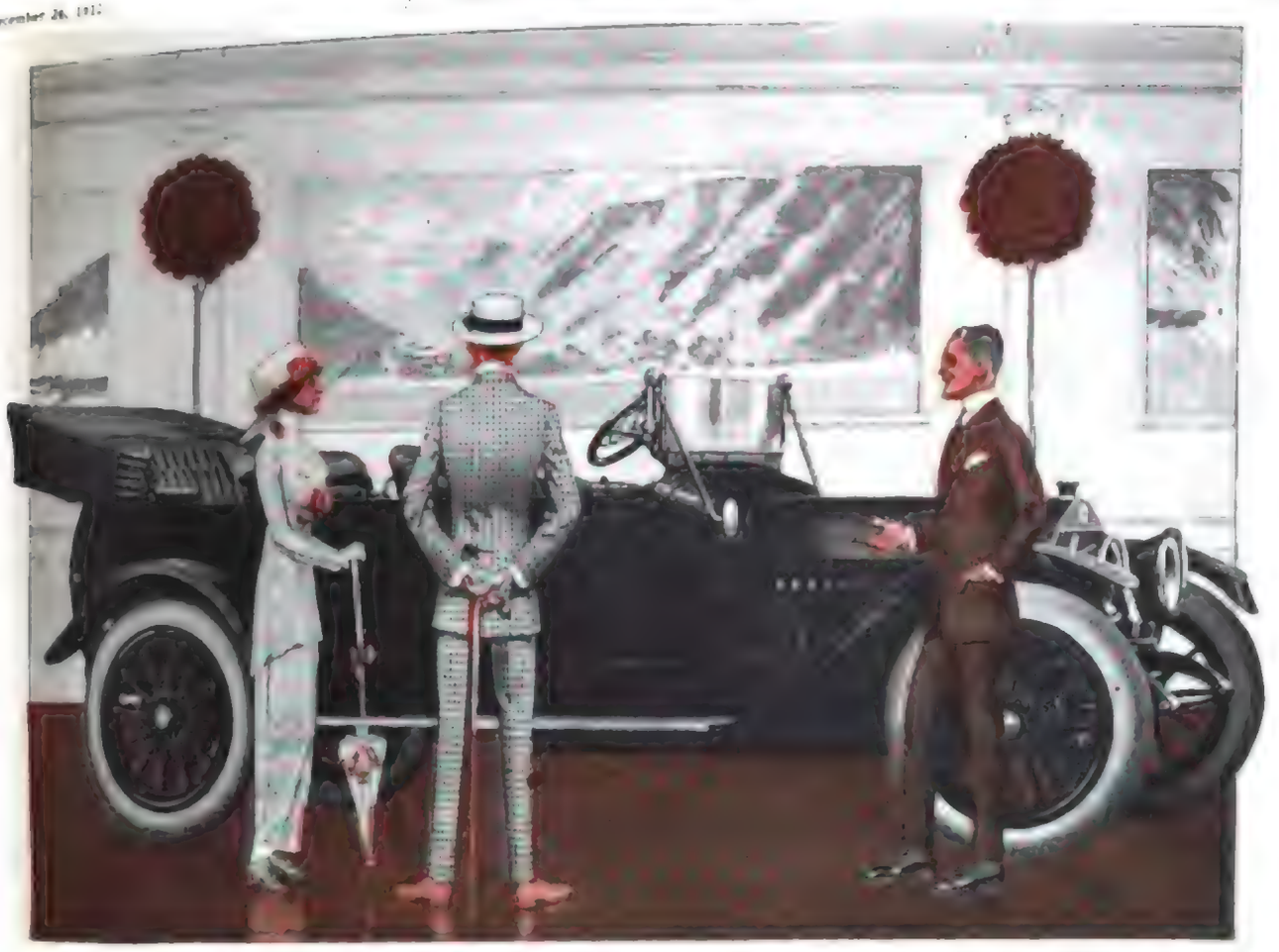
Each Grant-Lees Gear is accurately machined and perfect to the smallest detail. To guard them against even scratching in shipment we pack them individually as shown in the picture.

Manufacturers who demand the very best are fast adopting Grant-Lees Gears.

The Grant-Lees Machine Company

2360 Sixty-Ninth St., Cleveland, Ohio

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America's Greatest Touring Cars are Premier Sixes. The First of the Five Leading Makers to Establish the New Price Basis for the Six was the Premier

THE public has decided that the high-class car of the future must be a Six. The Premier is one of the four makers whose six-cylinder cars have created this six-cylinder demand. Seven years' production of successful sixes.

The Premier six-cylinder is not only a leader in price but in style and appointments. It is fitted with pneumatic starter, pneumatic tire inflator, independent electric lighting system, imported magneto, imported annular bearings, left hand drive, clean running boards, a cabinet mounted in the dash, providing a tool carrying compartment, gasoline fed by gravity, with filling cap accessible without removing the cushions, luxurious upholstering, Turkish cushions, concealed hinges and straight line bodies, finished with the pleasing touches which make for elegance and class.

Premier Sixes, $2735 to $4000

FULL TOURING CAR EQUIPMENT

The Premier has earned its position as one of the leaders among America's leading cars by its wonderful performance and successful showing in the most trying tours and contests each year.

***Manufactured by* PREMIER MOTOR MANUFACTURING COMPANY, Indianapolis**

Premier Six at pilot in 1907 Glidden

Premier Six laying out 1908 Glidden Tour in Ransleys Lake District.

Premier Six in the gumbo swamps of Tennessee in Glidden Tour.

Premier Six, Chairman's pacemaking car starting from Detroit on Glidden Tour.

Premier Six, pilot of famous Ocean to Ocean tour in 1911.

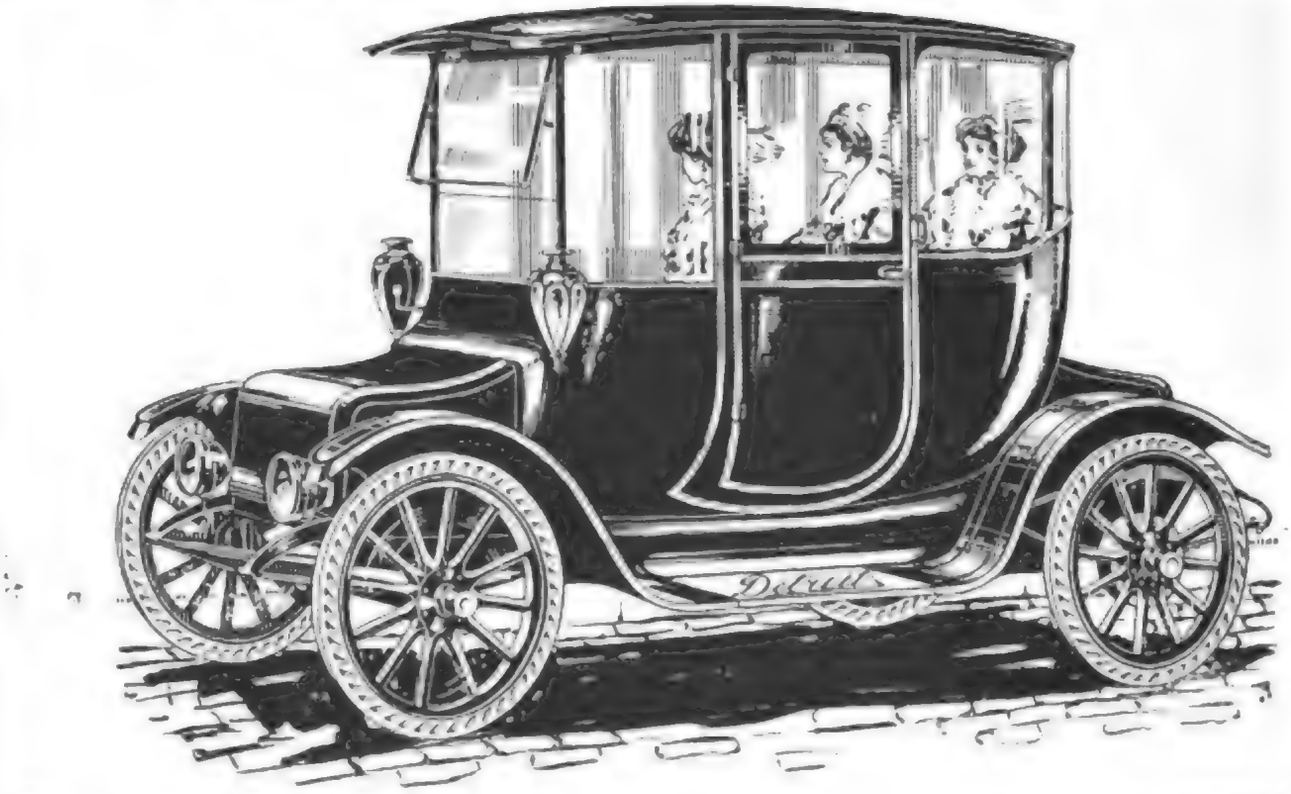
The start of the Indiana Four States Tour, of the Premier Six and Premier Prairie Schooner, which crossed the Continent with the Ocean to Ocean tourists, in 1911.



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THE Detroit Electric
Society's Town Car

The Detroit Electric—
The Big Opportunity for Dealers



Clear Vision Brougham

Model 42
$3000 F. O. B. DETROIT

Mr. Dealer, do you realize the wonderful possibilities in the electric car field, not only for big future business, but for immediate sales and handsome year-around profits, now? You should appreciate the fact that this electric is destined to be the car for all city and suburban uses. It is just the right size to be practical. It is simple and safe to operate; it is easy and cheap to maintain.

The Detroit Electric is the ideal car for winter use as well as for summer driving. Electrically started, electrically lighted and electrically controlled, it offers the utmost in luxurious comfort and cleanly travel. It is a car suited for the business man or the society woman for every day in the year—a car combining simplicity with the advantages of electricity obtainable in no other type of car.

Electric current is now the cheapest form of energy and electric construction is by far the least expensive to maintain Power is easily obtainable at any service station at low cost and is made still more convenient and inexpensive through private charging outfits.

The simplicity of electric construction requires the minimum of attention. The Detroit Electric has no complicated mechanism to require adjustment and care. Very little oil is used, which means not only small expense, but freedom from dirt and grease.

Roomy and comfortable, the Detroit Electric Clear Vision Brougham gives the luxury of the most expensive limousine at proportionately low cost. Deep, soft upholstery, rich artistic trimmings and fine finish of all parts give the Clear Vision Brougham a comfort and beauty of the highest type.

The agency for Detroit Electrics is the most valuable asset you can have in your business. We recently had occasion to change one of our agency connections and three different men traveled 700 miles each to Detroit to secure this agency.

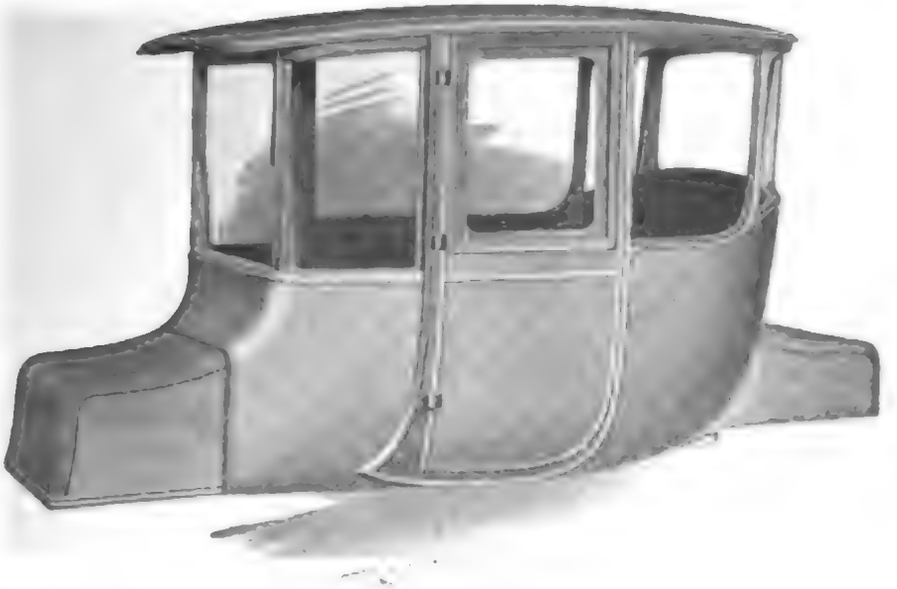
ANDERSON ELECTRIC CAR COMPANY

423 CLAY AVENUE, DETROIT, U. S. A.

Branches: NEW YORK: Broadway at 80th Street · BOSTON · BROOKLYN · BUFFALO
CHICAGO: 2416 Michigan Avenue · EVANSTON · KANSAS CITY · MINNEAPOLIS

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Detroit Electric Bodies of Finest Material and Highest-Grade Workmanship



The panels, mouldings, window sash and roofs of Detroit Electric bodies are made of **pure aluminum,** the advantages of which type of construction are readily seen.

Aluminum permits of shaping into more artistic lines than any other material. There are no sharp angles, or square corners in the bodies of the Clear Vision Brougham. Beautiful, rounding, curved effects are much in vogue and are **only possible** with aluminum, which can be shaped as easily as gold and silver, and after hardening has the tensile strength of iron.



Aluminum is lighter than wood, which is a big item in saving weight. It takes a beautiful finish and retains it without warping, cracking or checking. Detroit Electric bodies remain beautiful. The greatest care is taken to eliminate all noise. Bodies are cushioned from the chassis frames. A thick layer of felt matting is put between the aluminum roof and the top ribs of the frame for this purpose. Fenders are also of aluminum, each pair being fully **enclosed** between step and body.

Clear Vision Features— New Seating Arrangement

The Clear Vision feature of the 1913 Detroit Electric with all seats facing **in the direction of travel,** gives an unobstructed view ahead to all occupants. No one is compelled to sit facing backward. The driver sits in one of the front seats, an arrangement which insures safety and comfort, obtainable in no other way. The seats are all so **centrally** located that the driver is in no way noticeable whether alone or with others.

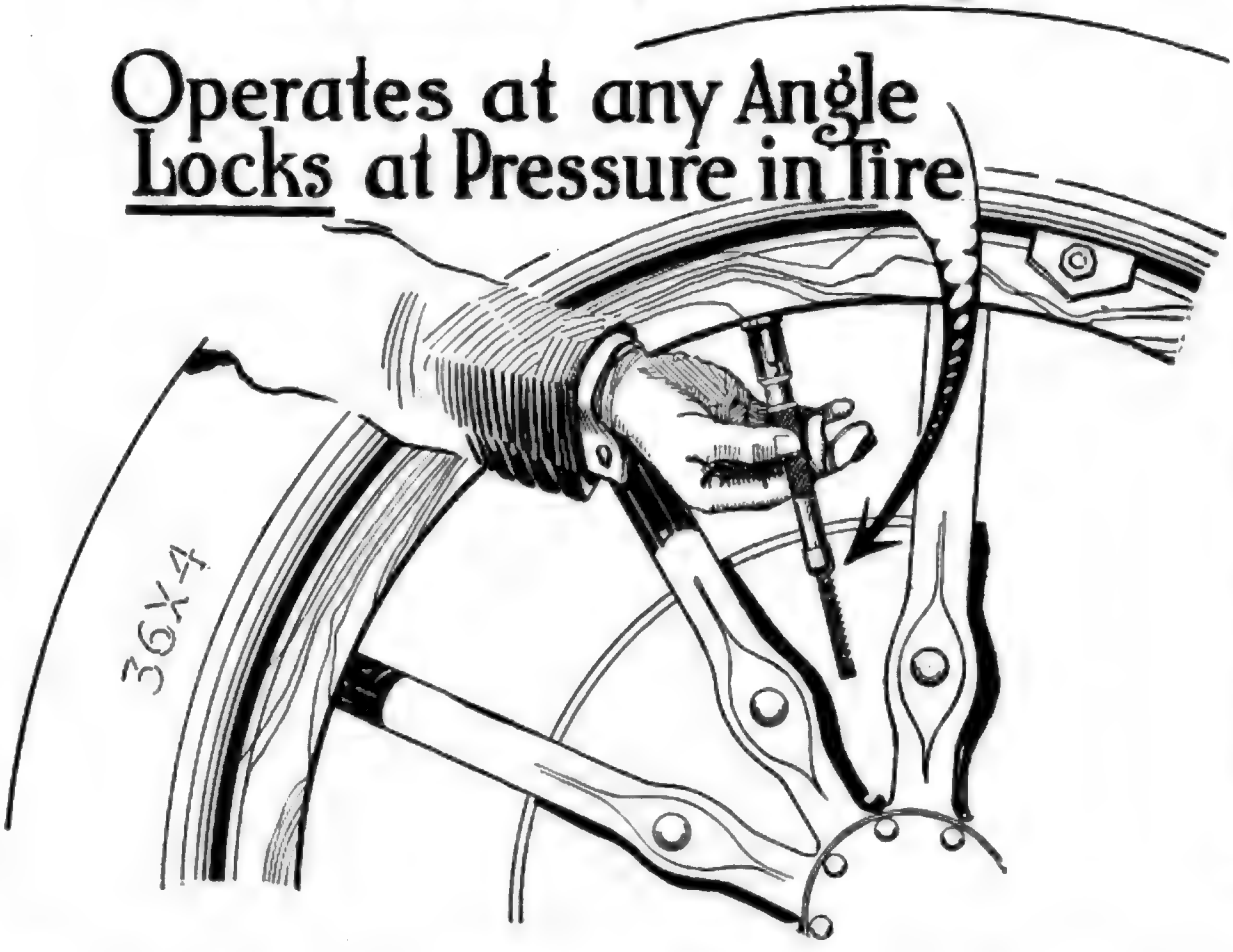
ANDERSON ELECTRIC CAR COMPANY

DETROIT, U. S. A.

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The New Positive Lock Stop Twitchell Air Guage

Operates at any Angle Locks at Pressure in Tire





Tire Insurance for $1.00

THE new Twitchell is the most accurate, simplest, most durable and most easily applied and read tire gauge made. It can be used with the tire valve at any angle and positively locks at pressure in tire—two essentials for a first class tire gauge which are exclusive Twitchell features. With a Twitchell gauge you don't have to pull the wheel around until the valve is at the bottom of the wheel. The ratchet makes it possible to get an accurate reading with the valve at any angle. The indicator bar is held not merely by friction but positively locks at the pressure in the tire and remains there until released by pressure on the end of the bar. That means that you can be sure of an accurate reading even when you are obliged to carry the gauge to the headlight at night.

With the aid of a Twitchell you can always keep your tires inflated to proper riding pressure and not only **lengthen the life of your tires** but **avoid 75 per cent of your tire troubles**. Yes, 75 per cent, for that is the proportion of tire troubles that are directly due to improper inflation.

The Twitchell is Tire Insurance

See the Twitchell Gauge at any of the big Automobile Shows and be convinced of its merits. A Tire gauge that can carry the advertising we are giving the Twitchell **must** be a **good** tire gauge—it must be the **best gauge to use**—consequently **the best gauge to sell** if you are a dealer.

THE TWITCHELL GAUGE CO.

1202 Michigan Avenue *Chicago, Illinois*

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The SPARTON



Dimensions:
Length, 12 inches
Flare, 7½ inches
6 Volts
Runson Dry Cells or Storage
Black enamel and brass or nickel bell

The First Electric Horn of Quality and Efficiency—At a Quantity Price

That headline means exactly what it says. It is the essence of our message. We cannot think of a single reason why it should be qualified. In size, mechanical and electrical construction, beauty of appearance, and volume of tone the "Sparton" compares only with the most expensive motor-driven horns. In durability and economy of current, it outstrips all. Its price is about one-third.

What the Fan Business Taught Us

We have been building fans for automobile engines for years. Today there are more Sparks-Withington Fans in use than all other makes combined. The secret of our growth is told in three words—Quality, Efficiency, Price. We designed the best fan, built it in quantities—got the price right. We are applying the same methods to the electric horn business.

How the "Sparton" Was Developed

It took over two years to develop the "Sparton." During that time it has been subjected to every conceivable test. We wanted to be absolutely sure we were right before we started to build it in quantities. New machines, that would give the horn a severer test than years of service in use, were invented. We knew how to get tone quality—we wanted durability—a horn that would stand up longer than any other—and we have it.

Special Machines Designed for Quantity Production

After the conclusion of all tests we designed special machines for making the various parts. These machines and the fact that we make every part of the "Sparton" horn permit us to quote prices unheard of for a high quality motor-driven horn. Remember, quality and efficiency have been added—not sacrificed.

Facilities That Enable Us to Produce the "Sparton" Horn at "Sparton" Prices.

1—Complete and modern machine shop for building tools.

2—Complete sheet metal plant.

3—Battery of High Speed Automatic machines.

4—Complete Electrical Department.

5—Enameling Department.

6—Plating Department.

7—Heat Treating Department.

The SPARKS-WITHINGTON

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Electric Horn



At Every Turn We Save You Profits That Every Other Manufacturer Must Pay.

We build our motors complete—manufacturing shafts and high speed bearings on high speed automatic machines; we stamp the laminations; wind both armatures and field coils; build a specially designed commutator; do all our own electrical work.

We stamp the bell, diaphragm holders, front and rear, diaphragms, diaphragm actuators, motor covers, push button springs and cases.

For all these operations other horn makers pay a profit to someone else.

Big in Size—Big in Tone—Big in Value
Neither Shrieky, Squawky Nor Scary

It is impossible to describe "Sparton" tone. It is big. It is forceful. It is instant. It warns and guards but neither haggles with nor insults. It has distance-penetrating ability that adds safety to driving. It demands right of way and gets it without offense. It has the power of bigness and dignity.

This tone is produced with minimum current consumption. The "Sparton" on test showed lower current consumption than any motor-driven horn of similar size. In tone quality experts pronounce the "Sparton" superior.

Two Styles Ready

The "Sparton" can be furnished in two standard types:

Dash Type—In Black Enamel and Nickel or in Black Enamel and Brass.

Under-the-Hood Type—In Black Enamel.

The dash type is twelve inches long with a flaring bell seven and a half inches wide. It looks big and is big.

The under-the-hood type has same motor and construction but is a trifle shorter.

Car Manufacturers—Act Quickly

We are now ready to talk 1913-1914 business. When our values are disclosed there will be a rush to get under cover. Don't wait too long or you may be too late. Better get a sample of the "Sparton" right away and give it a thorough test. Then ask us for prices. Our figures will give you a pleasant jolt—when you know the kind and quality of horn offered in the "Sparton."

Our Daily Capacity 700 to 1000 Horns

Before a word was printed or this first public announcement made, we built 7,000 "Sparton" horns. Our daily capacity is 700 to 1,000 horns. You see what we mean by "Quantity"—in the past the entire yearly output of all electric horn makers has not been sufficient to tax our capacity.

These facts are significant. They show our confidence in our horn. They explain why and how we can afford to make unusual prices. They indicate also, what every car manufacturer knows—**that the time for the electric horn as standard equipment has arrived.**

Price has been the bar. Now quantity production establishes a new scale of prices—with values better.

COMPANY Jackson Mich.

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SPARKS-WITHINGTON CO FANS



Our Capacity is 1000 Complete Fans Per Day

THE SPARKS-WITHINGTON COMPANY
Jackson, Mich.



Automobile
and
Accessory Parts
Milled from the Bar

MOST important in making automobile or accessory parts are results for safety in your assembled product.

¶ NAMCO duplicate products are made uniformly accurate to your specifications. The finish is exact and the threads are clean.

¶ You do not have to allow for spoiled pieces because all NAMCO parts must stand a rigid examination and test before shipping.

¶ Noise and wear caused by the vibration at loose and ill fitting joints handicaps the value of your machines. NAMCO parts will make your machines run smoother, quieter, and make them last longer.

¶ For these reasons you will find NAMCO parts less expensive, and being accurate, they will cost less to assemble. Use them on your cars for 1913 because you are particular.

¶ We also carry in stock all sizes of A. L. A. M. standard Cap Screws, Plain and Castellated Nuts, and Hexagon Brass Nuts.

We have an interesting booklet which gives over 200 reasons why you need NAMCO products. Be sure to ask for the "Trades' Service" booklet.



200 Reasons Why

THE NATIONAL-ACME MANUFACTURING CO.
AUTOMATIC SCREW MACHINES AND THEIR PRODUCTS
CLEVELAND, OHIO

BOSTON, 141 Milk St.
DETROIT, 1222 Majestic Bldg.
ATLANTA, Third Nat'l Bank Bldg.
NEW YORK, 77 White St.
CHICAGO, 23 S. Jefferson St.
MONTREAL, St. Henri

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BEAVER

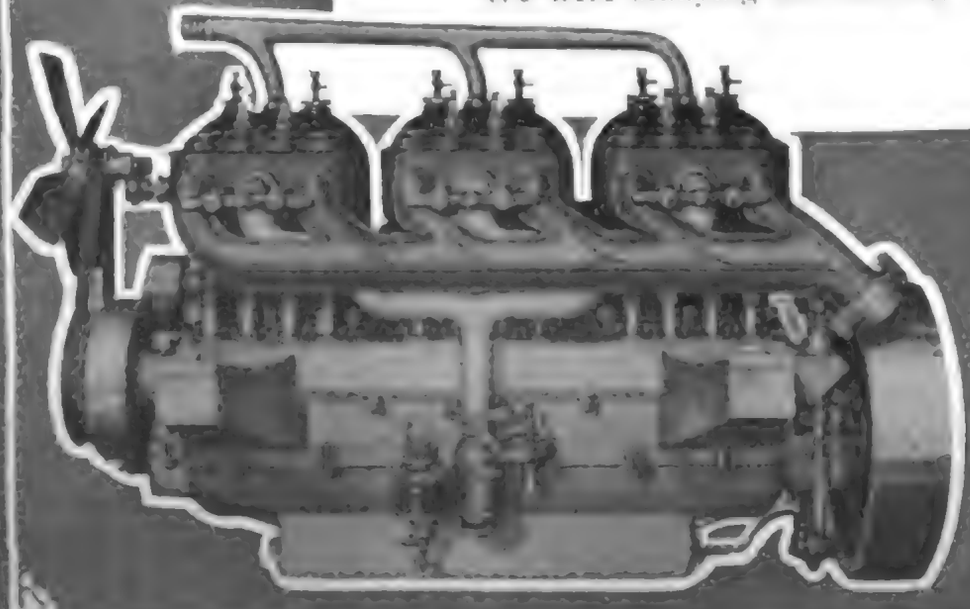
To Dealers

The prospective owner looks to you for expert advice before he buys. The manufacturer recognizes your position and is open to your suggestions on specifications.

Nothing in the car is of such importance as the engine. Have you investigated the latest phases of six-cylinder construction? Do you know why the Beaver Six Motor will make the best car still better?

We have a message for you. In it we will show you in detail a Six-Cylinder Motor that is a marvel of simplicity, silence and service—one that stands alone in these days of the perfected sixes. When you recommend a car tell your customer about the Beaver. We will give you the facts.

We were studying and solving the six cylinder problem



BEAVE

2402 First Avenu

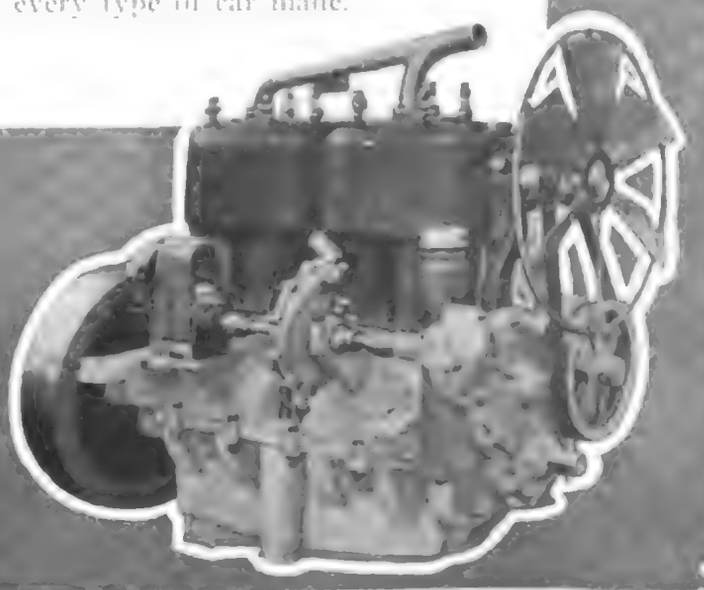
SIX CYLINDER POWER PLANT

five years ago, and today the Beaver Sixes are in advance of ordinary development.

It is no longer the question "A Six or a Four"—but which is the **best** six and you, manufacturers and dealers, ought to have the basic facts back of Beaver superiority. They are open to every man who claims to know the difference between a good engine and one that is built for profit only.

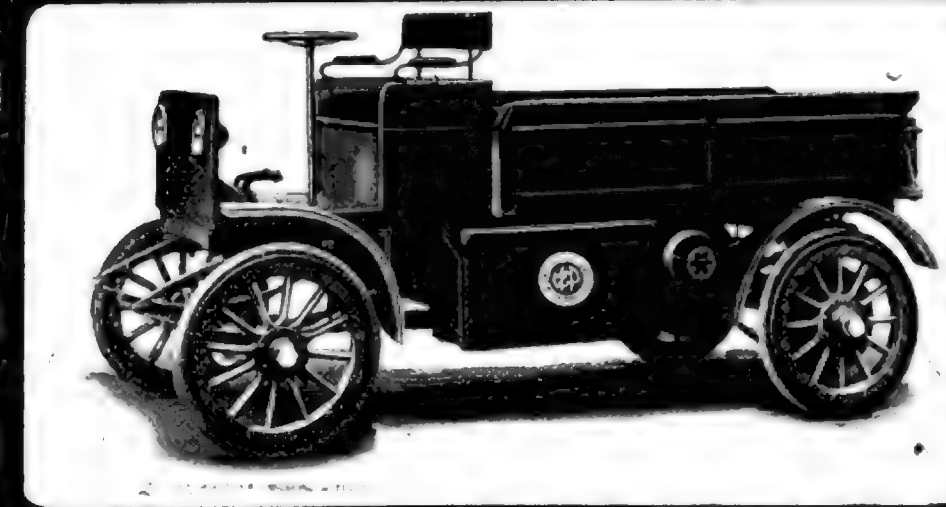
The Beaver 40-45 Six Unit has made good. It is constantly making more friends among dealers and owners. Manufacturers who are building silence, speed and endurance into their cars **know** this engine and install it.

Another popular Beaver model is the 28-30 H. P. Four Cylinder Unit Power Plant. Especially adapted for light trucks of 1500 to 2500 lbs. capacity. In all there are 17 different types of Beaver Motors, two, four and six cylinder, from 15 to 60 H. P., a motor for every type of car made.



UFACTURING
MPANY
aukee, Wis.

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The M & P One Thousand Pound Electric Truck Comes to Your Customer, Mr. Dealer, With an Iron-Clad Guarantee Back of It

This guarantee covers every possible angle, protecting you and the buyer in the matters of reliability and economy of operation.

The M & P One Thousand Pound Electric Truck is the first electric truck of its quality to be sold at M & P Prices. And because of long experience, and low overhead we are producing a vehicle which will positively give more or better service at lower cost of operation than can any other electric truck selling for as high as $2,200.

Comparison with the gasoline truck is unnecessary. We are selling electric trucks whose advantages are obvious.

A Truck That Makes Good at a Price That Sells It

The M & P Truck is the acme of simplicity—strong, sturdy, reliable and economical. In a word, it is properly designed and properly built. It is "Made to make good and it does." Tests prove that the cost of operation is twenty-five to thirty-three per cent less than that of a similar powered gasoline car.

A point that will also appeal to your trade is the price. It puts the high grade electric delivery wagon within the reach of the average retail merchant, who is, at present, utilizing horse-drawn vehicles for transportation purposes. We have the facts and data to prove to you and to such a merchant that the "M & P" can save him a surprisingly large amount of money.

You, Mr. Dealer, have studied the electric commercial proposition—you know that the trade is hungry for it. You don't have to go to the big manufacturer to sell this truck. You have but to present it to the dry goods merchant, the hardware man, or any other merchant with a delivery problem, to prove there is a waiting market.

Get the facts and figures covering this proposition, including complete description of the M & P and our liberal commission to you. Find out how and why it will pay you to get busy now.

M & P ELECTRIC VEHICLE COMPANY

Franklin and Dubois Streets **Detroit, Michigan**



This is an announcement of a tire filler company that is in business only for the purpose of selling tire filler—not for selling stock or territory.

FIRST, we want to impress upon everybody the fact that the American Kushion Kore Tire Co., Inc., is not a stock jobbing proposition. There is no stock for sale and the members of the corporation are all men of standing and reputation who are in business to make money out of the sale of Kushion Kore tire filler. Every statement we make here is backed and guaranteed by us to be true and we respectfully refer you to any bank or reputable business man in Buffalo as to the standing of our company.

Kushion Kore is a perfect substitute for air and in many respects it is superior to air in tires. Neither extreme heat nor extreme cold will in any way affect Kushion Kore. It will always maintain the same size and shape regardless of weather, road or temperature conditions. Just how long Kushion Kore will last is hard to tell but we know that it will outwear several casings. Kushion Kore is not melted or run into the tire tubes hot. As a matter of fact it is not attached nor does it come in contact with the casing, and the tubes are discarded entirely. Kushion Kore is placed in the tires in its original form after it has been thoroughly tested and examined, and then enclosed in knitted cover. Kushion Kore will not flatten or lose its shape in any way and, of course, it absolutely does away with blow-outs or punctures.

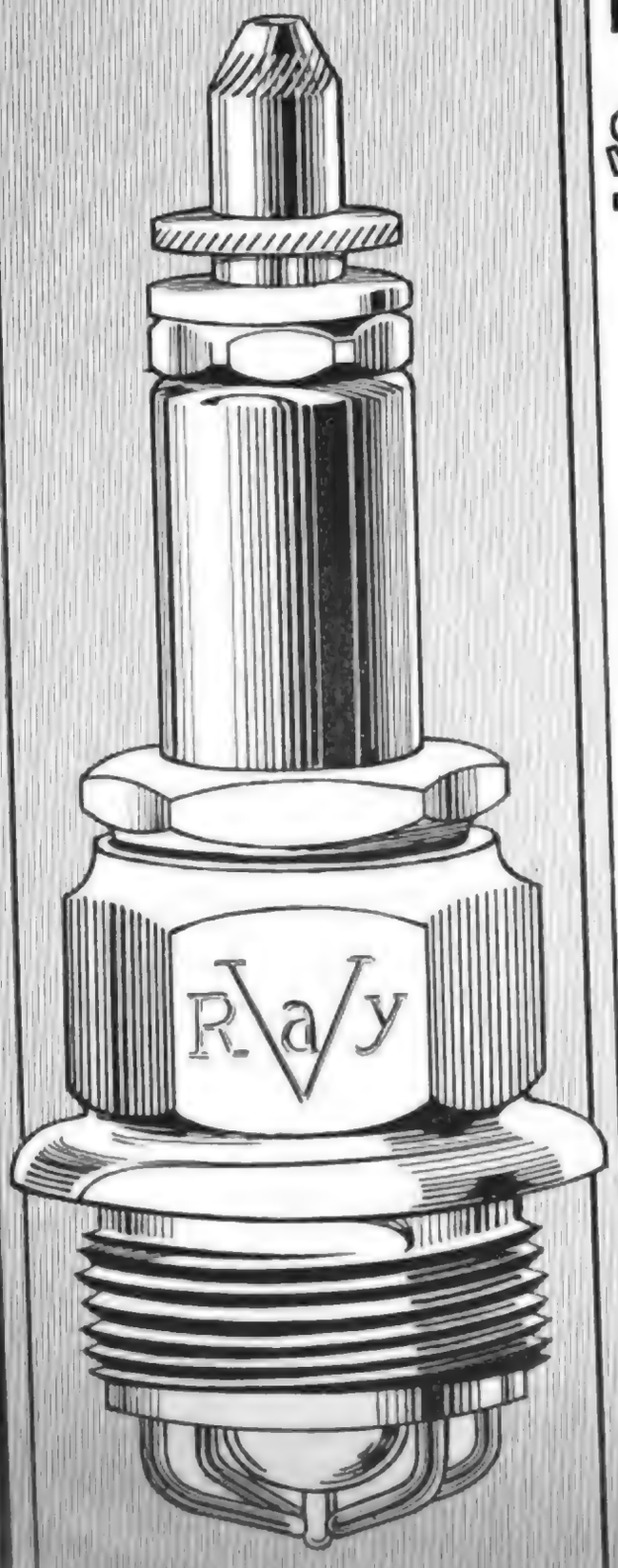
Kushion Kore is from 10 to 20 per cent lighter than any other tire filler on the market and is guaranteed not to contain glue, gelatin, glycerine or any other substitute that will dissolve in water. Neither does it contain rubber.

We are looking for bona-fide up-to-date dealers to represent us throughout the country just as they represent a tire company, a carburetor company or any other accessory. We are not trying to sell any state rights or stock or hold up the dealer in any way. We have a legitimate business proposition upon which any live dealer can make a goodly bunch of money, but he must make that money by selling Kushion Kore, just the same as he would by selling automobiles or anything else. We realize that we have made some pretty radical statements here and we hope only that you will give us a chance to prove the truth of them.

American Kushion-Kore Tire Company, Inc.

Buffalo, New York

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1913 V-RAY MICA LAVA SPARK PLUG

Dealers

This plug, which retails for $1.25, has more and better features than any plug on the American or foreign markets. Its electrical and insulating improvements are radical and right.

The MICA-LAVA spark plug has absolutely no chamber or recess in the shell exposed to the cylinder. It cannot harbor soot.

The solid block of flint-like lava, comes from the solid lower part of the steel shell—no chamber whatever. The lava is indestructible and is not affected by heat or oil.

The only mica used protrudes above top of spark plug and is not exposed to heat or oil. It has six cylindrical layers of sheet-mica wrapped about center stem before washers are put on.

The terminal-cap fits all cable terminals and has a unique self-cleaning feature attached thereto. The electrodes are of uniform length and will fit all valve clearances in any motor.

The electrodes, commencing with 1913, are of the very best Meteor wire and will withstand any heat to which they can be subjected.

The plug comes in four sizes, the ½" Standard, Metric, ⅞" A. L. A. M. and Standard Motorcycle Types.

The Famous V-RAY Porcelain Spark Plug

We will continue to handle our famous V-RAY PORCELAIN PLUG which has been radically improved and is better than ever. The PORCELAIN PLUG for 1913 is reduced from $1.25 to $1.00 each, and is made in the same sizes as the above mentioned MICA-LAVA PLUG at $1.25.

The V-Ray Co.

Marshalltown, Iowa

Chicago Show
Armory
Booth 31

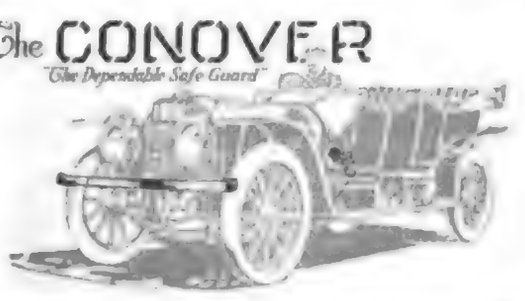
New York Show
Madison Square Garden
Booth 629

? WHICH

FOR EVERY CAR OWNER the question gets right down to this alternative: *damage* or a *Conover Safe-Guard.*

EITHER is inevitable.

COLLISION you *cannot* avoid. If you don't run into something, some other car or wagon backs into you. It is merely a matter of time for *every* car. Fenders, lamps, radiator, wheels, axle—any or all will be smashed to some extent. If badly, you can collect insurance; but you lose the use of your car while repairs are being made. If slightly damaged, you cannot collect a dollar.



PROTECTION you *can* have. And this for the original price of *one* Conover. Made on a new principle; backed by a new guarantee. Its broad, flat surface, sturdy semi-elliptic steel springs, with four contact points, were made to take blows. If dented, you can hammer back the protection surface. If broken, you can have a new Conover *free*, any time within two years.

WHICH alternative? Which is the economical, satisfactory sensible one?

Best quality of steel heavily enameled in black, royal blue, French gray or maroon; bar 2 inches wide. **$15.00**

Best quality of steel, brass or nickel plated, bar 2 in. wide **$17.50**

Bolt bronze, finished in either brass or nickel, bar 2 in. or 2¾ in. wide **$25.00**

Shipped, express paid, anywhere in the United States, on thirty days' trial, upon receipt of the regular price. When ordering, give name and model of car. Specify size and finish desired.

An attractive booklet will be sent free upon request.



LOVELL-McCONNELL MFG. COMPANY
Sellers Newark, N. J.

NEW JERSEY TUBE COMPANY
Makers Newark, N. J.

CONOVER

"The Dependable Safe-Guard"



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A handful of automobile advertisements from current issues of Vogue

EVERY time you improve the style and comfort of your cars, you make them just so much more appropriate for the readers of ***Vogue.***

Vogue readers have been schooled to appreciate luxury and convenience. They have the money to pay for it. In the circulation of ***Vogue*** we have bottled up the combined buying-power of the wealthiest families in America.

Twenty-seven of the leading automobile builders of this country advertise regularly in ***Vogue.***

Isn't it time ***Vogue*** was on ***your*** list?

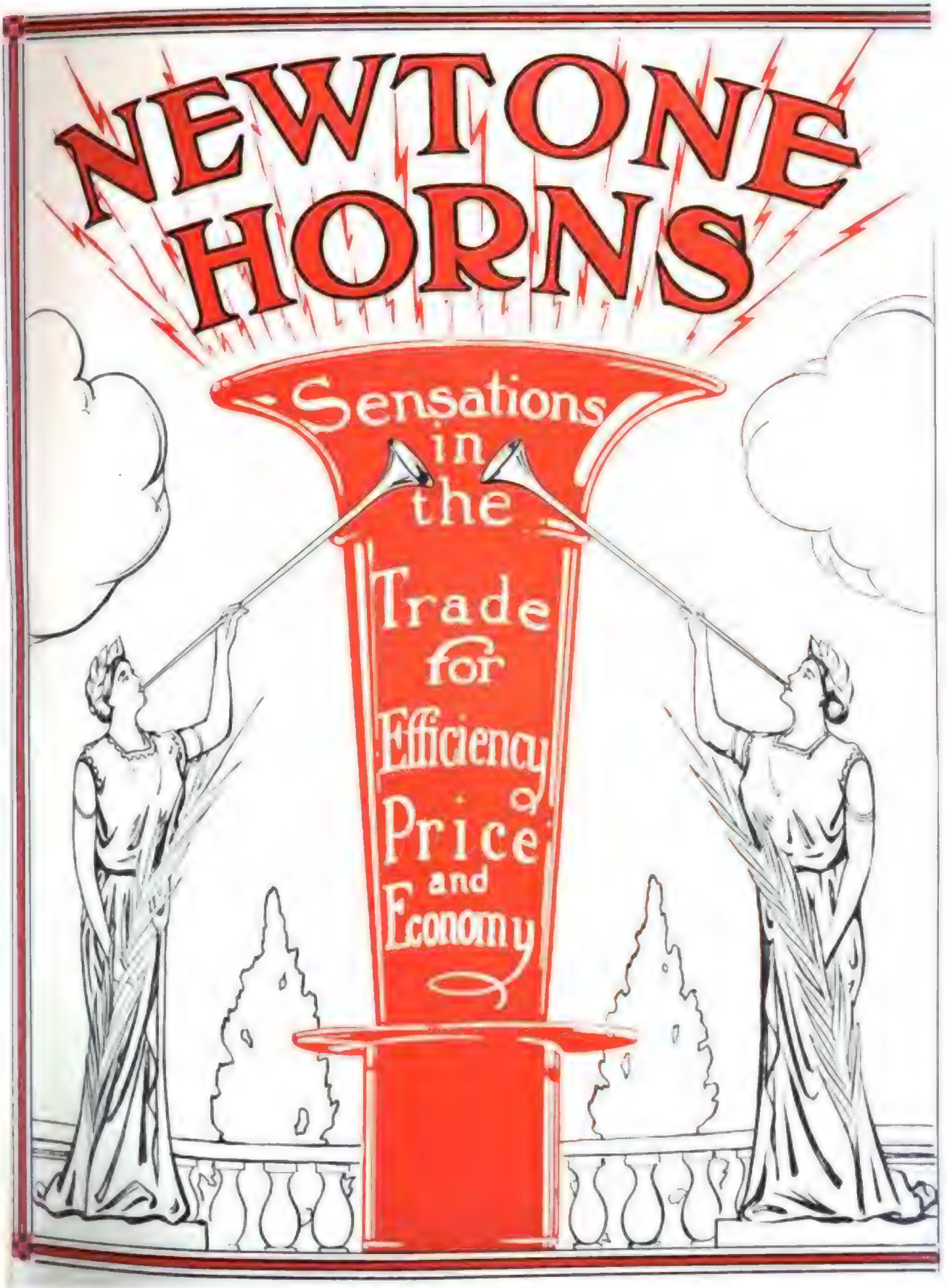
BARRETT ANDREWS
ADVERTISING MANAGER
443 Fourth Avenue, New York

STEVEN C. RAWLINS
WESTERN MANAGER
Corn Exchange Bank Building, Chicago

Vogue Automobile Advertisers

Packard
Pierce-Arrow
Simplex
Baker Electric
Columbus Electric
Premier
Hupp-Yeats
Borland Electric
Garford
Peerless
Locomobile
Stevens-Duryea
Alco
Waverley Electric
Broc Electric
Abbott
Jackson
Haynes
Lozier
White
Rauch & Lang Electric
Buffalo Electric
Detroit Electric
Hupmobile
Ohio Electric
Electric Storage Battery
Electric Vehicle Association.

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NEWTONE HORNS



We are the pioneer horn makers in the United States. 75 per cent of the horn consumption of the country is supplied by this company. The following statement will give an idea of the magnitude of our business. Note that during the past six months—what we consider the dull season—we have made and shipped over 22,000 horns monthly.

READ THIS AFFIDAVIT:

Helen L. Hicks, of Borough of Brooklyn, City and State of New York, being duly sworn, deposes and says that she has been employed by the Automobile Supply Mfg. Co., a domestic corporation, for about two years, last part in capacity of billing clerk and general office work and that she is familiar with the shipping slips, shipping books and bill books.

Deponent further states that she has examined said books and same show that the Automobile Supply Mfg. Co., shipped

In June, 1912—17,028 Bulb and Electric Horns of different sizes and types.
In July, 1912—22,006 Bulb and Electric Horns of different sizes and types.
In Aug., 1912—19,866 Bulb and Electric Horns of different sizes and types.
In Sept., 1912—22,156 Bulb and Electric Horns of different sizes and types.
In Oct., 1912—26,103 Bulb and Electric Horns of different sizes and types.
In Nov., 1912—22,392 Bulb and Electric Horns of different sizes and types.

Sworn to before me this 12th day of December, 1912.

(Signed) HELEN L. HICKS.

(Signed) ISAAC BROWN,
Notary Public, Kings Co.

(The original of the above affidavit is on file in the office of this publication.)

NEWTONE HORNS

NEWTONE SUPERIOR

$10



The Latest and Most Efficient Motor Horn to Sell at a Popular Price

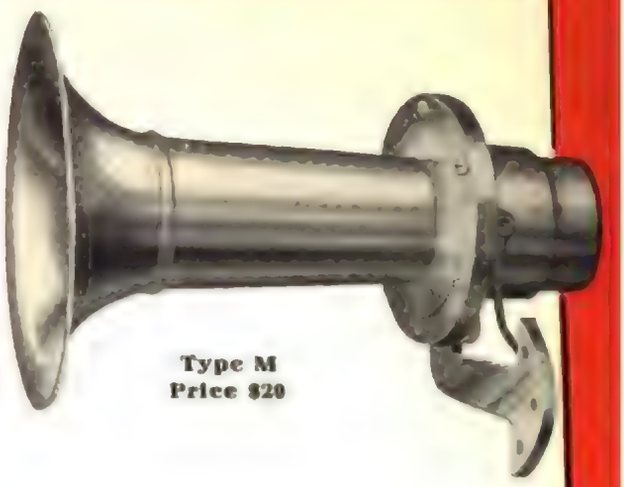
$2000 REWARD

to the manufacturer, jobber, dealer or agent in the automobile trade who can produce or show us a motor driven horn now on the market of equal efficiency and quality to the *Newtone Superior* selling at our price—(listed at ten dollars.)

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NEWTONE

This horn is equal to if not better than any other motor horn selling at 50 per cent higher in price. In fact it is impossible to produce a better horn at any price.



Type M
Price $20

NEWTONE "TORPEDO" TYP

The "Mile Away" Electric Horn

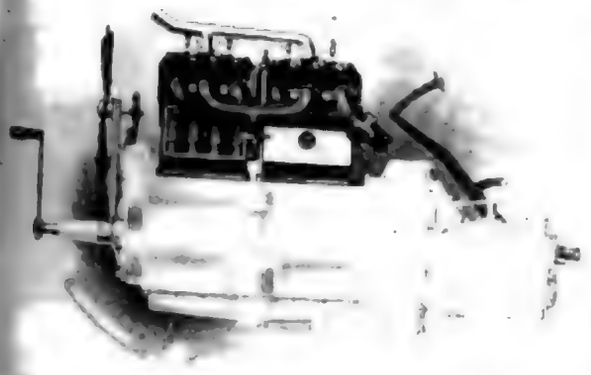


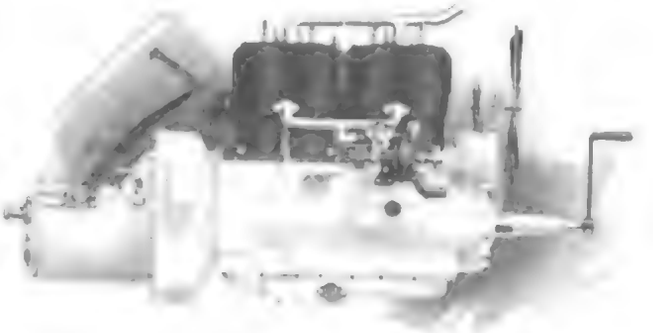
Torpedo Type
Price $20

For efficiency, style and price this horn has no equal. A deep, resonant note that warns without startling — that harsh, strident shriek being entirely eliminated.

AUTOMOBILE SUPPLY MFG. CO., Brooklyn, N. Y.

ERGON MOTORS





Introducing a New Motor

As the name implies, Ergon Motors are "work" motors—motors literally filled with work and energy. Ergon Motors are the result of a definite intention to keep pace with the growth and demand of the motor car industry—both in its pleasure and commercial branches.

This new motor, which is larger than any of our previous products, is of the four-cylinder, four-cycle "L" head type, with cylinders cast in pairs. It is a long stroke motor, the length of stroke being 6 inches, with a bore of $4\frac{3}{8}$ inches. Next to power, accessibility and simplicity have been the prime considerations in the construction of Ergon Motors.

It is the intention herewith to announce generally the production of these new motors rather than to specifically go into the construction details. However, we wish to emphasize the fact that wherever we have had recourse to parts or materials produced out of our own factory we have acquired only the acknowledged best. For instance, all of our bearings are either F. & S. or Timken. The crank shafts and connecting rods are made by the Driggs-Seabury Ordnance Corporation, of Sharon, Pa. The silent chain drives are made by Hans Renold, of Manchester, England. The design of Ergon Motors is such as to accommodate several standard makes of either electric or pneumatic starters.

HAZARD
MOTOR MANUFACTURING
COMPANY
ROCHESTER, NEW YORK

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The NATIONAL COMPOUND MIXER & PRIMER

SAVES 10% to 40% FUEL

Increases Power Speed and Flexibility

We Guarantee This

KILLS CARBON TROUBLES

Makes the Engine Run Better and Last One Third Longer

We Guarantee This

A device that will reduce expense and increase efficiency. Every customer of yours who is looking for the most and best out of his automobile, will take a buying interest in this device if you will simply demonstrate it, for we can prove that it will

Save from 10 to 40 Per Cent on Gasoline Bills
Increase Power from 10 to 40 Per Cent
Save 50 Per Cent of Engine Trouble
Prime the Engine Clean the Engine

We show it here—a small, compact, simple apparatus attached to the dashboard—installed in 20 minutes—never out of order—can be operated in an instant.

The National Compound Mixer breaks up and mixes in exact proportion every drop of gasolene with the proper amount of air. In other words, it finishes the work the carburetor leaves undone and we do not have to tell you that ordinarily only about one-half of the gasolene is converted into gas.

The Priming Feature

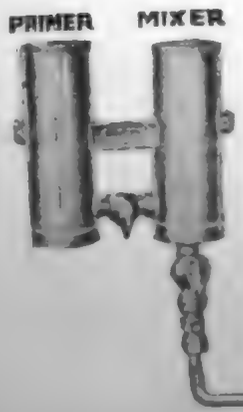
alone is particularly valuable in that every cylinder can be instantly primed by simply operating the priming valve, which sends a proper amount of rich mixture into all cylinders, making starting easy under all circumstances. Great for "sixes"—makes starting easy any weather.

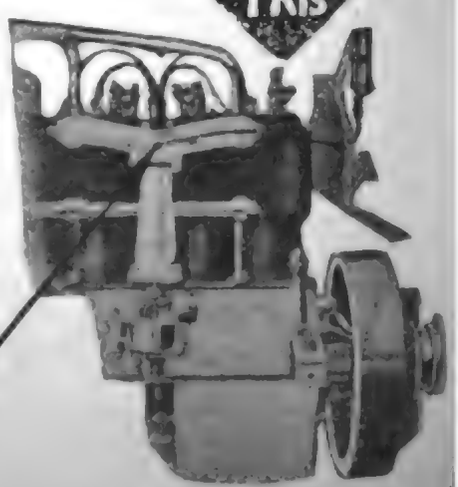
It Cleans the Engine

A couple of ounces of alcohol or kerosene dropped into the primer will, through a simple operation, clean the engine in a remarkably short time, thoroughly burning out every trace of foreign matter.

Your Customers Need It

and you can supply it if territory is open in your vicinity. It is distinctly up to you to write for our proposition. There is money in it for you.





National Manufacturing Co.

KALAMAZOO, MICHIGAN

RAYFIELD CARBURETORS

Will be exhibited at all the automobile shows this season.

During your attendance at the shows investigate the Rayfield Carburetor---look carefully into its construction---you will *learn why* it has become famous in such a short time.

You will *learn why* it won the Grand Prix, the Vanderbilt Cu two years in succession, the Savannah Trophy---every other leading race event throughout the country---why it holds more WORLD'S RECORDS than all other carburetors combined!

You will also *learn why* the RAYFIELD is not only the carburetor for greatest speed and efficiency, but also for highest ECONOMY.

WINTER OR SUMMER! RAIN OR SHINE! HIGH OR LOW ALTITUDE! THE RAYFIELD PROVES ITS SUPERIORITY.

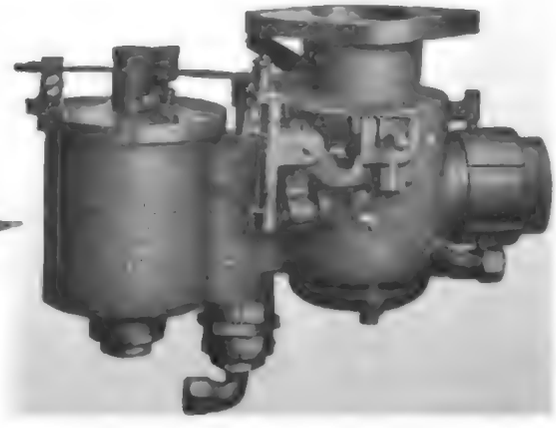
At New York, Chicago and other shows our most competent men will be in attendance.

What they tell you and what they show you will surely be interesting and profitable to every one interested in PERFECT CARBURETION.

You are invited to call and receive all necessary information.

New York Show, January 11th---25th, Concert Hall, Madison Square Garden, Space 311.

Chicago Show, February 1st---15th, Coliseum Annex, Spaces 114 and 116.



Findlesen & Kropf Manufacturing Company

21st and Rockwell Streets, Chicago, Ill.

Sales Offices: 1140 Michigan Avenue, Chicago, 997 Woodward Avenue, Detroit
Eastern Representative: George Sumner, 1841 Broadway, New York City

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NEW DEPARTURE BALL-BEARINGS

American Made for American Trade



New Departure Double Row, Exterior

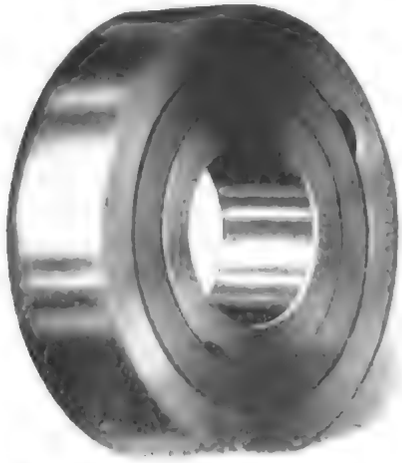
The American-Made New Departure Ball Bearings are positively superior because of

QUALITY OF STEEL USED—The peculiar work of ball bearings requires steel of special quality. To perfect processes by which this quality could be developed, we built and equipped an extensive engineering laboratory and physical testing plant. Here each lot of material coming into the factory is scientifically analyzed and treatment prescribed necessary to bring it up to the New Departure standard. The result of this great care is a steel of great strength, resiliency and toughness.

QUALITY OF WORKMANSHIP—There are not more than a dozen large manufacturing plants in the United States where the average daily wage rate is as high as ours. This brings the best mechanics to us. Much of the mechanical equipment is the invention of our president and is used exclusively by ourselves. Our system of inspecting is a continuous check against poor workmanship, each bearing being inspected not less than thirty-one times during process of manufacture.

NEW DEPARTURE BALL BEARINGS

Standard on 80% of 1913 Cars



New Departure Single Row, Exterior

QUALITY OF FINISH—New Departure ball bearings are more insistently gauged and tested for uniformity of dimension and accuracy of finish than any other. Our inspectors work within exceedingly close limits and bearings that do not measure up to established standards in all respects are rejected.

New Departure Ball Bearings are made in three types:

DOUBLE ROW—Combined radial and thrust.
SINGLE ROW—Strictly radial.
RADAX—Radial and one direction thrust.

See the interesting exhibit of this American made ball bearing at Madison Square Garden Automobile Show, Space 204, Balcony---Both Weeks.

NEW DEPARTURE MFG. CO., Bristol, Conn.

WESTERN BRANCH—1016-17 Ford Bldg., Detroit



Bower Roller Bearings

Right in Design Right in Quality Right in Service

A BEARING is only a small thing and yet it has a vital and important relation to the whole car. It affects service, affects fuel consumption, affects tire economy, affects power, affects ease of repair and adjustment.

As automobiles become more refined, as engineers pay closer and more scrutinizing attention to details the sale and use of Bower Roller Bearings increases.

For engineers, and all who deal with the public, realize that the less you leave for the public to do in the caring for a mechanical device of any kind the greater is the certainty of giving complete satisfaction.

And the use of Bower Roller Bearings entirely eliminates the necessity of one kind of adjustment that must be made when other types of roller bearings are used.

Bower Roller Bearings are non-adjustable radially. End play can easily and quickly be regulated without changing the RADIAL alignment; the RADIAL alignment never requires adjustment.

The body of the roller carries the RADIAL load; one end of the roller carries the end thrust, independent of the RADIAL load. Thus increasing the RADIAL load does not increase the end thrust; nor does increasing the end thrust increase the radial load.

To accomplish this in a single bearing unit without combining the radial and end thrust in a single element, is to achieve the highest type of roller bearing efficiency—and that is exactly what we claim for the Bower.

Every Bower claim is susceptible to proof—and the increasing use of Bower Roller Bearings—now in their fourth successful year—points unmistakably to the fact that we are "delivering the bacon."

Made in all regular standard sizes. Interchangeable with all the prominent makes of ball or roller bearings.

Get in touch with our engineering department, or write for full details.

We will exhibit at Concert Hall, Madison Square Garden, New York, and at Coliseum Annex, Chicago—glad to see you

BOWER ROLLER BEARING COMPANY, Detroit, Michigan

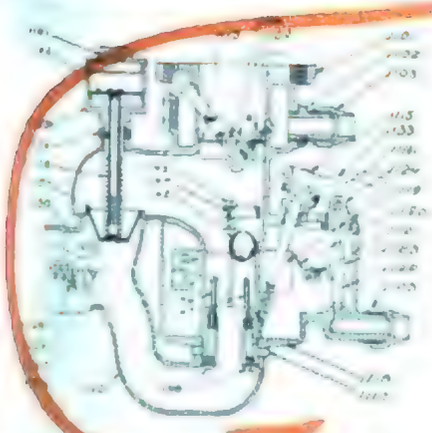
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A Carburetor That You Will Have to Reckon With Now

Does not flutter, load nor leak—easy to crank in the dead of winter. Gives a quick getaway and a steady, solid pull. These are not wild claims but direct, positive statements that demand investigation.



The MAYER
The Carburetor of Maximum Efficiency



The use of the Mayer guarantees economy of gasoline and more power. The Mayer is tinkerproof—and every part is accessible. It is right not a part of the time, but all the time. Eight years of success back of every Mayer—and you will find it on some of the best cars built. "Deeds, not words" is our motto—the Mayer will prove its own case to any manufacturer or any dealer. Send for the literature today.

DEALERS—We handle Automobile dealers direct and extend to you the advantages and facilities of our complete service department which has been established with this end in view. We take care of Mayer users and make satisfied customers—the best asset for the automobile manufacturer and dealer.

Mayer Carburetor Company

Sales Office:
818 Ford Building
DETROIT, MICHIGAN

Factory:
2673 Main Street
BUFFALO, NEW YORK

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The LUXURIOUS BROC



Elegance and Roominess Mark the New Broc Models

THE BROC actually offers more of comfort, luxury and beauty than intending purchasers expect in an electric.

This page shows the interior of Model 29. Front seats revolve on safe, substantial pedestals; cushions are much deeper than those of any other make of electric; backs are shaped. There is ample head-room, body-room, foot-room. From cushion-top to ceiling is 44½ inches.

The new Model 31 (also with pedestal front seats) is a forward-drive brougham for five passengers. It is built — as all Brocs are — with the most faithful attention to every detail of safety, comfort, convenience, beauty.

The Broc Electric Vehicle Co.
1677 East Fortieth St. Cleveland

Model 29. Five-passenger Brougham, two passengers, showing pedestal front seats



IMPORTERS' SALON

An Exposition of European Cars of Quality

Dealers visiting New York will find ample enjoyment and profit in a visit to this exhibition, which will be held

In the Grand Ball Room of the Hotel Astor, Broadway and Forty Fourth St., from January 2d to 11th

Here will be found comprehensive exhibits of the following cars, all representative of Europe's choicest car making genius and skill

Austrian	*Lancia*	*Minerva*
De Dion Bouton	*Metallurgique*	*Panhard*
Isotta Franchini	*Mercedes*	*Renault*

Healey & Co. *Locke & Co.*
The Holbrook Co. *Quimby & Co.*

The Importers' Automobile Alliance have made ample preparation to entertain the trade. Here this splendid group of ultra exclusive cars may be inspected in comfort, amid delightful surroundings and far from the rush and crowding which are characteristic of the domestic shows. All dealers are invited to come and see and hear. The Importers' Salon will prove intensely interesting.

IMPORTERS' AUTOMOBILE ALLIANCE

In order to discourage idle sight-seers a nominal fee of fifty cents will obtain, but interested dealers will be furnished tickets free upon request

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IMPORTERS' SALON

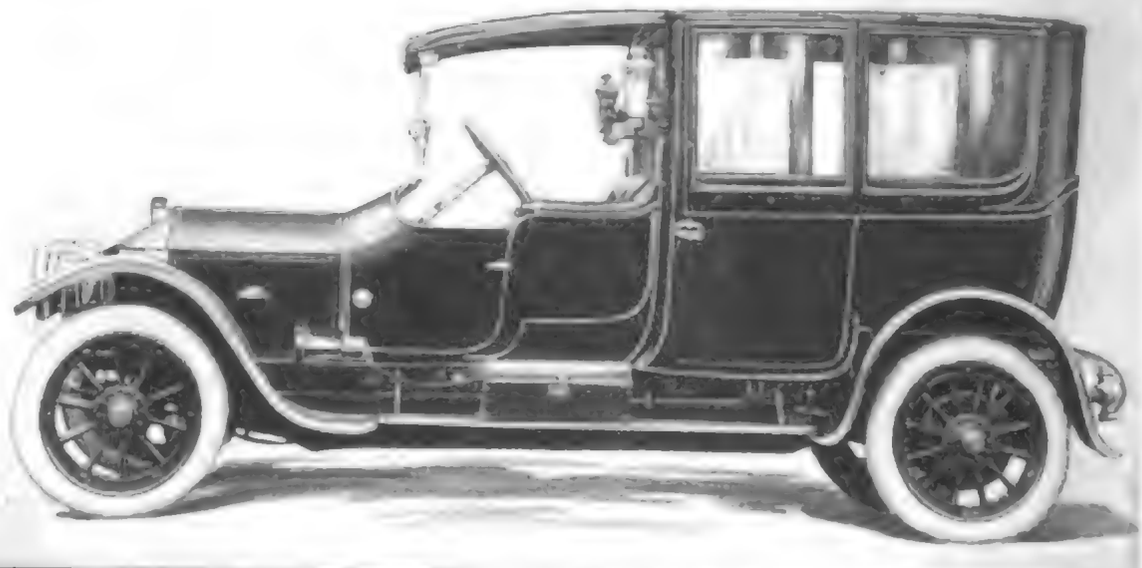
Exclusive in any Community

METALLURGIQUE

Will Sell in Your Community

DEALERS

The European Car Idea is Growing in America — is your Ear to the Ground



Dealers who read this announcement will do well to consider the advisability of forming an agency connection with us for handling the Metallurgique—a car for the classes—a distinct and exclusive product, sensational in body design, equipment and appointment. These cars are limited in quantity—unlimited in quality.

Luxury of appointments are regal—beauty of design and finish supreme on both sides of the water. Service unlimited. The Metallurgique is the only logical car for men of wealth and position who desire an equipment that will make all others appear commonplace.

Let us help you find and please and sell to those in this class. As a preliminary, write and get the literature and terms. We can throw more light on the Metallurgique, Europe's choicest product.

See these cars at Importers' Salon, from Jan. 2d to 11th, Hotel Astor, New York, Southwest Corner of Ball Room

THE METALLURGIQUE MOTOR CO., 1934 Broadway, New York

W. C. and H. N. Allen, Proprietors

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IMPORTERS' SALON

Lancia

AMERICA'S FAVORITE FOREIGN CAR
SOLD AT AMERICAN PRICES

Lancia cars, made in Europe, offer the American buyer every European point of advantage in material, engineering, factory workmanship, design and finish—and it is conceded that our leading models, which claim as "the finest cars" are superior to all cars of American manufacture.

And American Dealers can sell Lancia cars at American prices.

DEALERS WANTED

ADAMS-LANCIA COMPANY
238 West 58th Street New York City

A complete line of Lancia cars will be on exhibition at the Importers' Salon, Hotel Astor, New York, east center of Ball Room, from Jan. 2d to 11th



IMPORTERS' SALON

FRANCE GERMANY

De Dion Bouton



The Car Known the World Over

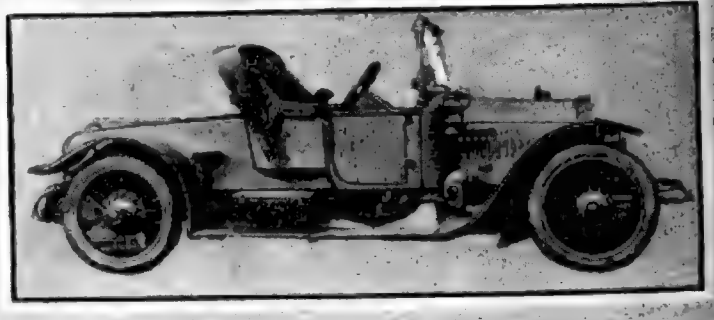
Our three 8 cylinder models, 30 horse power, 50 horse power and 100 horse power, place the De Dion Bouton years ahead of all others.

DE DION BOUTON SELLING BRANCH

For U. S. A., Philippine Islands, Cuba and Porto Rico

1649 Broadway (51st Street) New York

The De Dion Bouton Commercial Vehicles stand foremost everywhere.



One hundred and ten De Dion omnibuses are used by the Fifth Avenue Coach Co. of New York.

Twenty-five De Dion trucks are in the service of the Government of the Philippine Islands.

ITALY BELGIUM

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The Warm Hand Wheel is just what its name indicates—a steering wheel that will keep the hands good and warm even in the biggest blizzard that ever blew down from the north.

It is operated at very slight current consumption from the lighting outfit or storage batteries. On Ford cars the current is furnished from the magneto which is built in the fly wheel.

Installation is easy and the work can be done in a short time by any one with ability to follow the very simple directions which come with the wheel. Remember, no working parts of the car are interfered with in the operation.

DEALERS YOUR OPPORTUNITY

lies in getting quick action in the matter of installing these wheels in your territory. They are needed and wanted for six months in the year, and they will never be more appreciated than right now in the heart of winter.

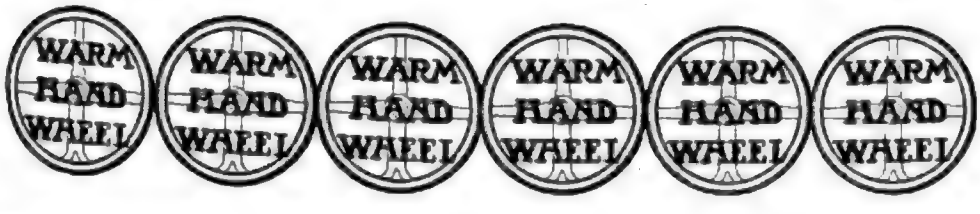
You don't have to be told that the Warm Hand Wheel will encourage winter driving which now has cold hands as one of its big drawbacks. More driving means more business for you—another reason, aside from your direct profits, that you will have to admit.

The Warm Hand Wheel retails for $15; your share in the transaction is liberal—your customers pleased and your business increased in profit and more trade.

Send for the proposition.

The Warm Hand Steering Wheel Company

527 Fifth Avenue **NEW YORK**



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Made in Germany

SCHAFER



BALL BEARINGS

That leading manufacturers use Schafer Ball Bearings is proof positive of their value from a QUALITY standpoint, for it would be a grave error in judgment for them to risk the reputation of their product by gambling on bearings of problematical value for the sake of economy.

The Reasons for Schafer quality are simple, but final.

They are made in Germany where steel making is far in advance of American practice, and not even content with this material, we incorporate the finest extraordinary steel of special analysis.

Schafer Ball Bearings are engineered by the highest type of skill procurable—men mentally equipped to devise resistance to load, shock, side thrust and other influences, that must be met and guarded against.

Schafer Ball Bearings are inspected at every stage of construction. Each separate ball, cage, and raceway must get its "diploma" by stages in which hardness, tensile strength, accuracy in turning, grinding and finishing are determined clear up to final shipping.

Used in America

SCHAFER



BALL BEARINGS

Specialization—and by that we mean meeting the requirements of our trade—has been a factor largely responsible for the up-building of our business.

To the car designer, this specialized knowledge is of more than ordinary value, because the proper designing of bearings for a particular car is quite as important as the selection of spring, axle and other major parts in which alignment, weight, support and other important problems must be figured out and acted upon.

The automobile engineer who demands this co-operative service as co-equal with right material and expert workmanship, will find the combination in these quality bearings at right prices.

Schafer Ball Bearings are worthy of your recommendation and the cars you sell will have added a major point of quality if so equipped.

BARTHEL, DALY & MILLER

42 Broadway New York



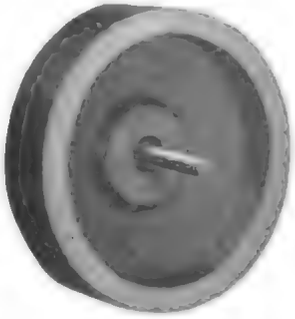
A Sure Car Seller *when a man sees the*

USL TRADE MARK
THE UNITED STATES LIGHT AND HEATING CO.

U-S-L ELECTRIC
Starter and Lighter
For Gasoline Automobiles

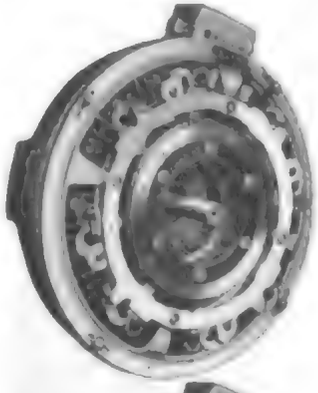
He Wants a Car That Has This Equipment

You know how red hot the starter question is. Here's the proposition that has set the whole automobile world talking—the U-S-L ELECTRIC STARTER and LIGHTER. With it you avoid a complexity of gears or other reduction devices employed to enable a puny starting motor to coax the engine over. The U-S-L is *direct connected*. Substituting armature weight for fly-wheel permits the installation of a powerful, rugged, noiseless motor-generator.



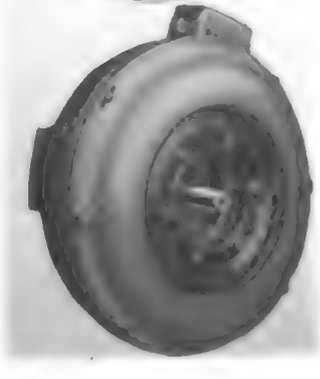
Simplicity—The U-S-L is the simplest of all starting and lighting systems in both principle and construction. By it the old-fashioned cast-iron

Fly-Wheel is eliminated (because no longer needed) and its place taken by the U-S-L Armature.



The Armature is the sole moving part. It is bolted for keeps on the engine shaft—is a unit with the engine, and does fly-wheel duty.

Power—The U-S-L does its work positively and easily, without noise, jerk or jar. It whirls the engine from 150 to 400 R. P. M. as long as necessary, and, as a Generator, supplies all the current car can use for any purpose. It is also a stand-by power plant; when the engine stalls, a simple push of the foot button will carry the car out of danger.



Compactness—The U-S-L Motor-Generator is self-contained within fly-wheel space inside the aluminum casing shown in this illustration.

No Added Weight ***Nothing to Oil***
No Complications or Trouble

Cars thus far equipped with the U-S-L Electric Starter and Lighter are:

RAMBLER	GARFORD "NEW SIX"
OVERLAND	EDWARDS-KNIGHT
BERGDOLL	MOYER

And Endorsed by the Entire Automobile Engineering Profession.

See the U-S-L Electric Starter and Lighter at the Shows; New York, Madison Square Garden, Space 157, and Grand Central Palace, Space 205; Chicago, Coliseum, Space 326; Boston, Mechanics' Building, Space 431.

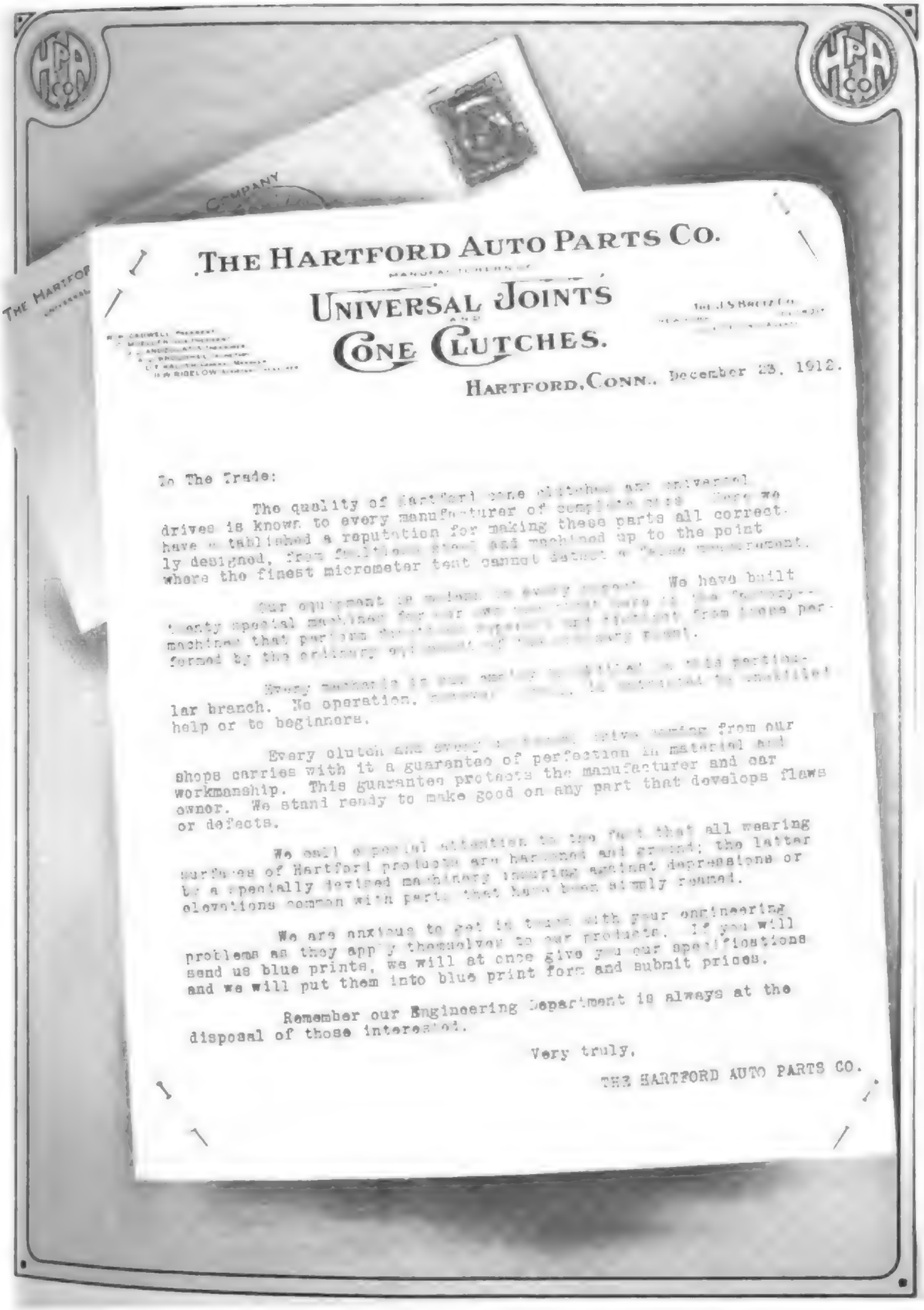
THE U. S. LIGHT AND HEATING COMPANY

General Offices, 30 Church St., New York **Factory, Niagara Falls, N. Y.**

Branch Offices and Service Stations:
Chicago, New York, Boston, Cleveland, Buffalo, San Francisco, Detroit, St. Louis

Manufacturers of the U-S-L Storage Battery

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THE HARTFORD AUTO PARTS CO.

MANUFACTURERS OF

UNIVERSAL JOINTS AND CONE CLUTCHES.

HARTFORD, CONN., December 23, 1912.

To The Trade:

The quality of Hartford cone clutches and universal drives is known to every manufacturer of complete cars. Here we have established a reputation for making these parts all correctly designed, from fine steel and machined up to the point where the finest micrometer test cannot detect a [illegible] measurement.

Our equipment is modern in every respect. We have built [illegible] twenty special machines for our own use, many of the [illegible] machines that perform [illegible] formed by the ordinary [illegible].

Every [illegible] lar branch. No operation, [illegible] help or to beginners.

Every clutch and every [illegible] shops carries with it a guarantee of perfection in material and workmanship. This guarantee protects the manufacturer and car owner. We stand ready to make good on any part that develops flaws or defects.

We call especial attention to the fact that all wearing surfaces of Hartford products are hardened and ground; the latter by a specially devised machinery insuring against depressions or elevations common with parts that have been simply reamed.

We are anxious to get in touch with your engineering problems as they apply themselves to our products. If you will send us blue prints, we will at once give you our specifications and we will put them into blue print form and submit prices.

Remember our Engineering Department is always at the disposal of those interested.

Very truly,

THE HARTFORD AUTO PARTS CO.

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CONE CLUTCHES

The FAMILY OF TH



WE call attention to the Har ford Cone Clutch Series—M 700, M 600, M 500—all models design now standard on many America's leading pleasure cars an trucks. These clutches are made aluminum or steel (at your option and can be removed without inte fering with any other part of th power plant.

Hartford Universal Drives—F 500, F 400, F 300 shown here—ar liberally built, hardened and groun through our own processes an with our own speciall devised grinding m chinery. The margin safety allowed on the and all other universa is much wider than th allowed by competiti designers. This serie adapted for cars ratin from thirty to seven horsepower.

Hartford K 700 and 600 E universals are extensive use on high powered cars. In com mon with Hartfor practice obtaining wit all universals, high ca bon steel, drop forgin are used throughout. A working parts a ground within close lim its, are interchangeab and embody fullest Hartford quality of workmanship and finish.

Hartford K 700 universal also illustrated here is adapted for u on any car from the 20 H.P. pleasure vehicle to the highest power co mercial truck.

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HARTFORD AUTO PARTS CO.

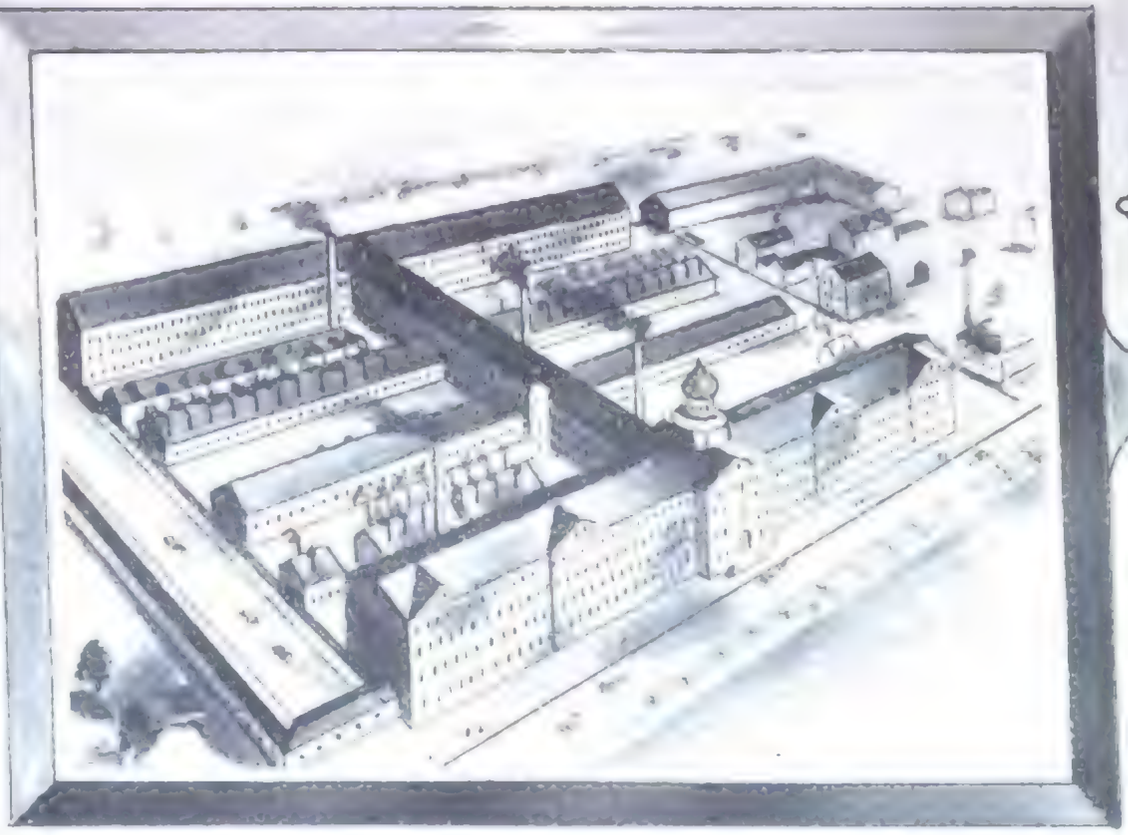
UNIVERSAL JOINTS



Get our bulletins covering the complete line of Universals and Cone Clutches—or if immediately in the market, send for our representative, and don't lose sight of the fact that while the "wheels are turning" pretty rapidly here, we are still in shape to put large or small orders through on time.

HPA CO.

THE HOME OF THE HARTFORD AUTO PARTS CO.



Specialization is the key note of quality production—specialization that means concentrating brain, energy and money in the work of making one or two things and making them well.

The plant of the Hartford Auto Parts Company, shown here, is a practical demonstration of the soundness of the "specialization" idea, standing today as the largest factory in the world devoted exclusively to the manufacture of cone clutches and universal drives.

It costs good money to produce parts that are stressed to the "Hartford" standard—but this works out for us as a reputation builder **and for you, Mr. Car Manufacturer, as an assurance of quality that will do its part in establishing and holding YOUR reputation.**

"Deliveries as promised" is part of our system, and this means that we increase facilities just as rapidly as demand calls for such increase. This plant is never overcrowded to the point where we have to send apologies instead of shipments.

HARTFORD AUTO PARTS CO., Hartford, Conn.

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CHICAGO
Show Space
North
Coliseum
Gallery

Let Your Steed be Worthy of Your Chariot

MOST automobile buyers select their first car because of its appearance. In making their second purchase they inspect the chassis even more critically than the body. If you are building automobiles for repeat sales you must install a motor that is consistent with the quality of your car, one that will appeal to and satisfy the most experienced motorist.

THE RUTENBER MOTOR

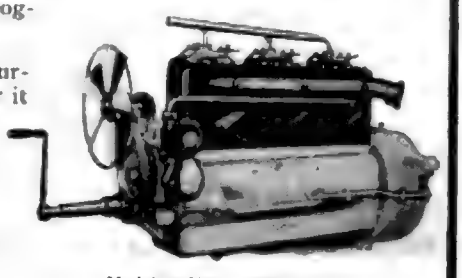
is such a motor. No matter whether it be for the handsomest limousine or for the most powerful truck, for the racing car or for the light delivery wagon, for the roadster or the touring car, the Rutenber Motor offers the assurance of consistent service, dependability and economy of maintenance. It is honest, substantial, powerful and silent. It has plenty of speed, endurance and reserve energy. It has established its own reputation and has won recognition for many a car.

When competition is keenest the Rutenber Motor furnishes the argument that clinches the sale. Thereafter it gives the service that insures reorders and extends the reputation of your car.

Write for the Rutenber Book.

RUTENBER MOTOR COMPANY

MARION INDIANA



Model 28 Unit. Valve Side

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Dealers Who Want to Sell More Cars for Spot Cash Will Find the Basis of a Sound Plan on this Page

We Can Help You to Help Your Prospective Customers to Buy Cars Through You.

IT is noteworthy that there are many concerns and individuals in your locality who want pleasure cars and commercial trucks but who cannot afford to buy them on the cash plan now in vogue.

We refer particularly to business houses with capital tied up—concerns that could turn one or more trucks into a working asset if they could afford to buy them—

And there are doctors or professional men or salesmen who could get dollar for dollar value out of a pleasure car if they had the capital to invest.

It is this lack of ready money that hampers your business, Mr. Dealer.

Realizing this condition, we have formed an organization to extend financial assistance to motor car buyers—especially those who need them more for business than they do for pleasure.

This plan, based on sound financial principles, gives you the benefit of a quick sale and your customer quick delivery and the purpose of this advertisement is simply to ask you to introduce us to prospective buyers who are short on capital.

HARMAN-YOUNT CO.
KENTON HARMAN Pres.
1790 Broadway New York

This company is organized to do business on a square basis and our contracts bear only legal rates of interest. The proposition will meet the approval of any man of business judgment because it is simply a case of his borrowing money at ordinary rates of interest on security which he, in accordance with our plan, will be able to furnish.

If you have prospective customers who hesitate on account of lack of capital, then you will be doing yourself, as well as us a service if you will refer them to us and tell them to write for our proposition.

We Give Financial Assistance to Prospective Car Owners at Legal Rates of Interest

We Lessen Sales Resistance and Create New Selling Outlets for Car Manufacturers

It will pay you to acquaint yourself with the details, for then you, too, can put the matter personally before those interested.

Remember, this plan is mutually co-operative.

It sells more cars for the manufacturers, puts more commission in your pocket, and gives your customer the benefit of ready money.

The help-the-dealer plan we have worked out is logical, square and attractive from every angle. It enables him to show the man who is short on ready money a quick, short cut to the ownership of a car—the manufacturer gets his cash and the buyer squares up with us on the easy payment plan, and at regular rates of interest.

We are forming many mutually valuable business connections. In every instance all round satisfaction results. We can do equally well by you and your prospective trade if you will co-operate. Write today.

HARMAN-YOUNT CO.

1790 Broadway ***KENTON HARMAN, Pres.*** **New York**

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B-T-K

PARTS OF QUALITY

TRANSMISSIONS, CLUTCHES and LEVERS

To fill all requirements in pleasure cars and light trucks

Contract Work, Gear Cutting

Brass, Copper and Nickel Plating

Our Engineering Department is at your service

For further particulars address

AUTO PARTS MFG. CO., Dept. J. Muncie, Indiana

The GRINNELL
Gas Controller and Igniter

Lights, dims and extinguishes all gas lamps on the car through a simple turn of the hand. Coupled to valve-stem of acetylene tank. Direct control. Always within easy reach.

Convenient
Safe
Dependable

WRITE FOR BOOKLET AND DEALER DISCOUNTS

The G. C. A. Manufacturing Co. Pittsfield Mass.

Sole Licensed Manufacturers in the United States

Price Complete **$24**



Studebaker



1913

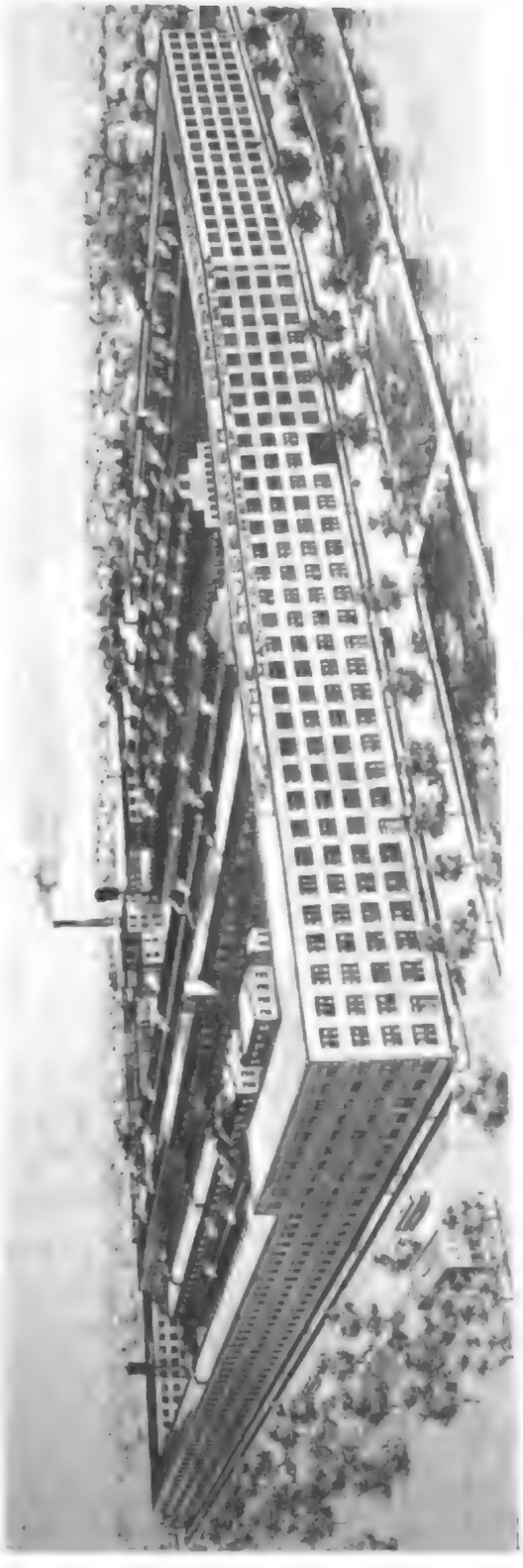
To make unmistakably clear the superiority of Studebaker automobiles is the purpose of this advertisement. You will, we believe, be interested in the many important matters described in the following pages. It is the story of one of the great achievements of modern industry, and, because it is true, it will be found convincing.



Studebaker "35"

The Studebaker Corporation, Detroit, Michigan.

Studebaker





STUDEBAKER FACTORIES

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Studebaker

Why This Advertisement Has Been Written

MANY automobile purchasers, largely on account of the fact that they are unable to secure first hand information, do not make efficient purchases. Efficient buying depends almost entirely upon knowledge; the knowledge of, first, where to buy; second, what to buy, and why.

Few manufacturers have had the foresight to take the public into their confidence, and honestly endeavor to explain to them the fine points of their product.

It is, therefore, our purpose, in the following pages, to describe the Studebaker product in such a detailed way as to leave no doubt in anybody's mind as to the character of motor cars that we are making and selling.

We shall do so by taking up the various parts individually, explaining how we get the raw material, why we know it is good, how we test it, how it is made up into parts, why our design and construction is proper, how we satisfy ourselves as to our machines' efficiency and endurance, and why the Studebaker product is worthy of its name.

The Studebaker Line

The new Studebaker cars are built on three chassis, the model "25" carrying a five-passenger touring car, and Roadster bodies; the model "35" with a six-passenger touring car, Sedan type and Coupe bodies; the "Six" equipped with six-passenger touring car and two-passenger roadster and limousine.

In making these cars at their remarkably low prices, we firmly believe that we are giving you more for your money in material, workmanship and finish, not to mention the liberal equipment, than any other motor-car maker in the world.

We are not making this claim unsubstantiated.

We shall now proceed to show you why.

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Studebaker

Manufacturing Conditions

ALL Studebaker models are built under the same manufacturing conditions, all are similar in design and identical in the quality of material. They undergo the same careful treatment in the inspection and testing of raw materials, have the same high grade workmanship, careful assembling, accurate and painstaking inspection and thorough testing.

The manufacturing of the model "25" is not slighted in any way, because it is low-priced.

This is characteristic of the Studebaker policy.

We believe that anything that is worth while doing at all, is worth doing well.

Studebaker quality is insisted upon in all Studebaker products regardless of price.

The motors are built in the same way.

In fact, the entire mechanism is practically the same in all cars with the exception of one or two distinguishing features.

The steels, bronzes and babbitts used are the same.

The method of assembling is the same.

The same high-grade automatic machinery make the parts of all.

They are assembled by the same expert workmen.

The purchaser of a model "25" receives the same treatment and generous "looking-after" that the owner of a 6-cylinder gets.

HOW CARS ARE BUILT IN THE STUDEBAKER PLANT

To build a business successfully the manufacturer must make a legitimate profit.

He must allow the dealers a reasonable commission. At the price at which Studebaker cars are sold it would be difficult to do this were it not for the fact that we are able to buy raw materials in enormous quantities, make them up in large lots and assemble them in an efficient manner.

In spite of the fact that we pay high wages to our men we are able by means of business short cuts and manufacturing savings to produce a vastly superior product at a low rate per car.

The secret of our success along these lines is due almost entirely to the manner in which we have laid out our plants and grouped our manufacturing tools. We have avoided wherever possible "double handling;" putting into practice what efficiency experts have discovered will decrease the number of motions required to perform certain operations.

By means of carefully indexed stock rooms, special trucks, overhead trolleys, special assembling and testing frames, we have cut down the work of handling the parts to a minimum.

The Studebaker factories are the largest and best equipped motor car manufacturing plants in the world. We have our own immense forge shop, foundries, and batteries of automatic machines where we build the entire car from raw iron and steel to the finished product. Over 250 drop-forgings enter every Studebaker car.



Showing how efficiency engineer lays out shop arrangements to avoid unnecessary handling.

Operations that used to require 10 or 12 motions have been reduced to four.

Transportation operations that needed four men and consumed over an hour in time are now handled by one man in less than 2 minutes.

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Studebaker

Our large drop-forging plants and improved foundries make short work of parts which a few years ago had to be made by hand or tediously machined. The introduction of steel stampings in our rear axle and other parts of the car, such as the running board, and brackets, have not only enabled us to increase the efficiency of the cars by decreasing their weight, but simplified very materially the process of making these parts.

We could go on with an enumeration of a hundred other such innovations which our experts have introduced. Suffice it to say, however, such has been the number and value of these improvements, that it is now possible for us to make and sell a line of cars, completely equipped in every detail, at such low prices as to make the Studebaker product the sensation of the motor car trade.

The Studebaker Chemical and Physical Testing Laboratories

NO AUTOMOBILE manufacturer has as complete an experimental department, chemical and physical laboratory as we have.

We make this statement without fear of contradiction. Not only does the department alone occupy an entire building larger than some motor car factories, but the character of its equipment is much superior to that of any other testing laboratory of this kind, and it surpasses also the equipment found at most of the best universities.

Apparatus for the complete testing of chemical composition, physical strength, and molecular construction has been installed.

Owing to the fact that many makers have made the same broad claims regarding their laboratories this statement may not seem impressive.



Interior of our balance room, where accurate weighing is done. The floor upon which these scales rest is independent of the rest of the factory and is not affected by vibration. This precaution is necessary owing to the delicateness of the apparatus. These scales are so accurate that they will easily weigh the amount of graphite in a pencil mark made on a piece of paper.

The photographs, however, will convey a somewhat better idea of the vastness and scope of these laboratories and the number of experts required to maintain their operation.

A look into the thousands of records that our engineers have made would still further impress you with the remarkable work which such a department accomplishes. Unlike many such efficiency departments, this one has paid for itself many times over.

It has caused the rejection of inferior material, changed heat treating formulas, suggested new metals, new babbitts and bronzes, new wheels and new tires, and made possible numerous valuable improvements found only in Studebaker cars, which no amount of careful planning without such help could possibly have accomplished. It has suggested methods of testing which have proved to be vastly superior to those generally accepted as proper and sufficiently thorough.

The problem of heat treating, which, as you know, has a great deal to do with the resistance and wearing qualities of metals, has for many years been a stumbling block to the engineering profession.

While many theories have been evolved which experimental tests have seemingly verified, yet no one knew exactly what could be expected.

Our laboratories furnish us with exact knowledge on these matters.

To accomplish this, we added, in addition to our chemical and physical laboratories, another equipment suitable for what is known as "Proximate Analysis." This system of studying the structure of metals depends upon a minute microscopic examination of their molecular structure.

So pleasing and satisfactory have been the results obtained by this method that we have adopted it for all of our regular work.

Crude material is now a known quantity to us.

We know what we need for every pur-

Studebaker



A view of one end of our chemical laboratory, showing apparatus for [illegible] tests and other chemical analyses

pose; what metal is best suited for every part in our cars; why it is best, and how to handle it to get the maximum strength out.

When a shipment of crude material comes into our plant we do not depend upon the manufacturers' specifications. We pay extra to have metals made the way we want them. We buy them in big runs, and analyze samples of every shipment that comes in.

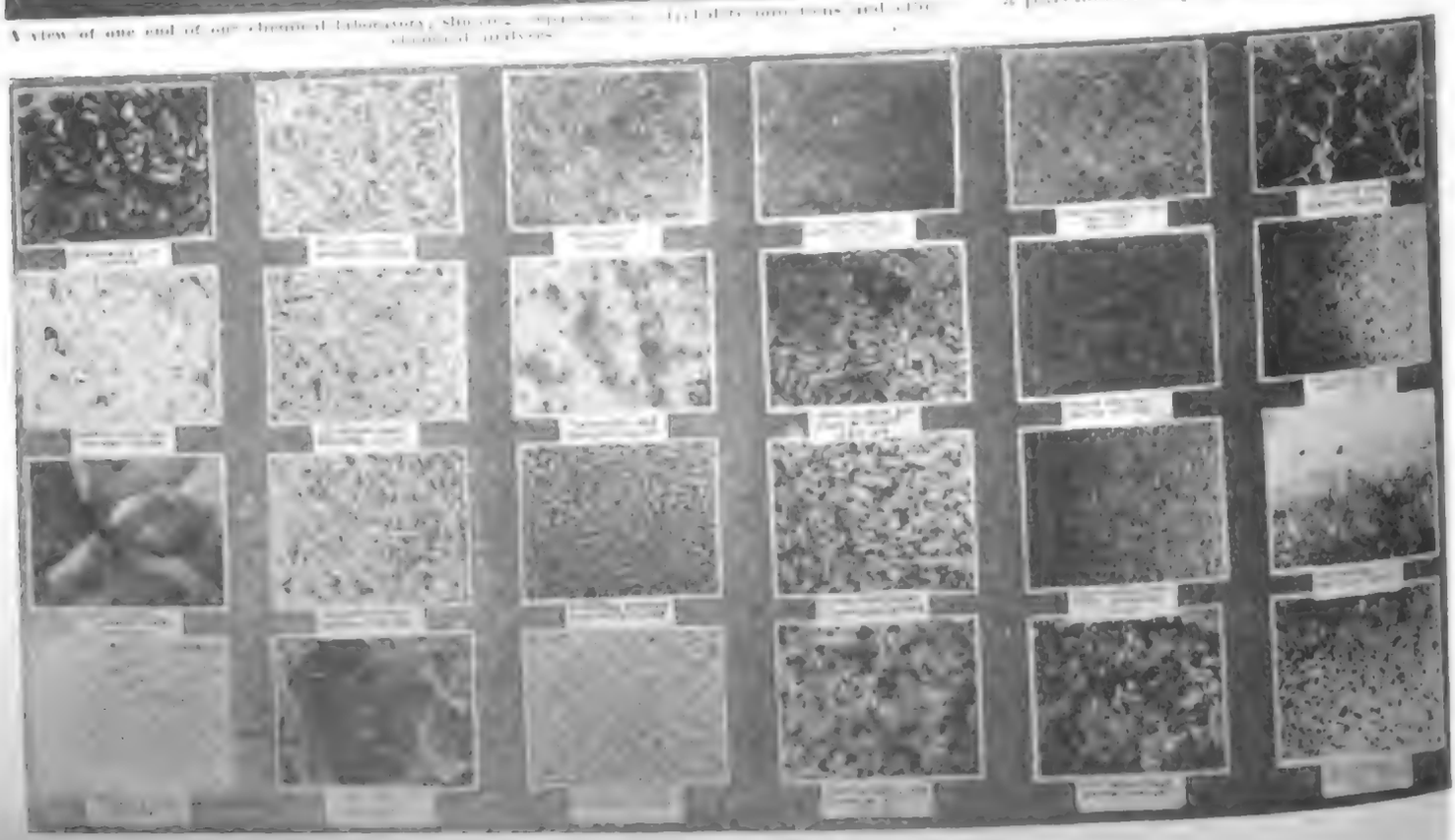
Not content with a mere chemical analysis we make physical tests and microscopical examinations to check up our chemical laboratory findings.

We test for comparison, tension, torsion or twisting effect, hardness, wearing qualities, lubricating qualities.

We break parts by slow and fast vibration, bending and unbending, find out everything that we need to know by methods that are as accurate as the mathematics of astronomy.

Even wheels and tires are subjected to the same rigid chemical and physical tests.

We know exactly how strong a material is; what its general properties are, and what its true worth is. Consequently, we buy scientifically and efficiently. You, as a purchaser, reap the benefits.

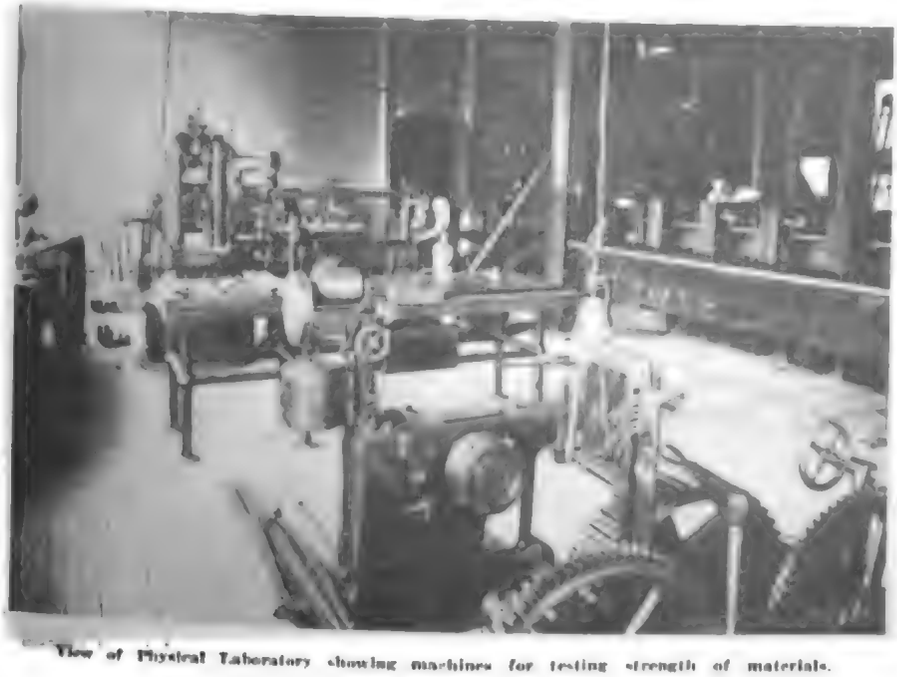


Magnified cross sections of steel and other materials used.

Studebaker



The Proximate Analysis Laboratory where molecular structure of materials is studied under microscope.



View of Physical Laboratory showing machines for testing strength of materials.

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MOTOR WORLD

Studebaker

December 26, 1912

Body Construction and Finish

THE statement is frequently made by automobile manufacturers that bodies are especially well finished, but few of them give details as to exactly how this is done.

If you will look at some of the illustrations you will see that Studebaker bodies are particularly well made, well shaped and well braced. The top irons run from top to bottom, and are firmly held in place by a number of screws. Double trimming strips, well braced backs, and many other special features will be noticed. Twenty-four operations are required to complete the upholstering and painting.



View of body after wiring and switches have been put in. This work is all done before the upholstering is put on.



24 ACTUAL OPERATIONS

The rough bodies are first primed with a preservative; they are then glazed to cover hollow color varnish is laid on, twenty-four hours after which a second coat is added.

After allowing twenty-four hours for this to dry, the bodies are again taken to the rubbing deck, and rubbed smooth.

A coat of rubbing varnish is then applied, followed by a second coating of the same material, which, after twenty-four hours, is again rubbed.

During the twentieth operation the striping is put on and body wiring finished.

The job is then ready for the upholstering. After this is completed the entire surface is cleaned with water, and rubbed smooth, after which the final finishing coat of varnish is applied. This is allowed to dry for forty-eight hours or more, after which the aluminum scuff plates are put on, and the body completely equipped.

The result is that the bodies on all Studebaker cars have as good a finish as it is possible for skilled workmen to give them, and if there is one thing that Studebaker workmen can do it is to finish a body correctly.

No workmen in the world have had greater experience in this line.

DETAILS OF CONSTRUCTION

The auxiliary seats are also worthy of your careful inspection, as they are of excellent material, very rigidly made and mounted in bayonet sockets. The trimming strips, running along the top of the body, also show refinement in detail.

Instead of being merely fastened on with screws, you will notice that each fastening is provided with a countersunk nickel washer, which not only makes a better looking

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Studebaker

UPHOLSTERY

What is true of painting is true of upholstery as well, as Studebaker upholsterers are masters of this art.

The leather used is the finest hand-buffed leather that can be purchased.

The burlap and hair are of an equally superior quality.

The springs that form the frame work are the best that can be purchased, and their construction is such that they are braced in every direction.

You will see how this is done by referring to the illustration.

Now, just a word about hand-buffed leather. Leather used for upholstering is of four different grades, known as "split," "deep-buffed," "machine-buffed," and "hand-buffed," the last being the finest grade, and costing from 5 to 6 cents more than the machine-buffed.



Upholstering the seat cushions. Pressing down the hair preparatory to tying it in. Note high-grade, hand-buffed leather and genuine curled grey hair used.

These various grades of leather are obtained from the different parts of the skin of the animal, the split being that next to the flesh, the deep-buffed being that portion between the split and the machine-buffed, while the hand-buffed is the outside coat.

While many makers are satisfied to use inferior qualities, some even using the split, which costs from 8 to 12 cents less, we prefer to utilize the best we can buy.

The gray hair used in stuffing the cushions is of an A1 quality, costing from 8 to 10 cents a pound more than that used by many manufacturers.



Rear seat, showing thickness of cushion and form of auxiliary seats. Note the small amount of room that it takes when folded up.

WINDSHIELDS AND FENDERS

The windshields have been simplified and much improved in design and appearance.

For the "35" and SIX the windshield is made in two-glass sections, both adjustable, and is known as the "rain vision and ventilating type," giving rain vision, clear vision and ventilation.

The "25" windshield is of the ventilating type.

The frame is finished in black enamel, with nickel-plated trimmings.

The fenders and mud guards of crown cross-section, for the SIX and "35," fit the body snugly, and add greatly to the beauty and distinctive appearance of the car.

LAMPS

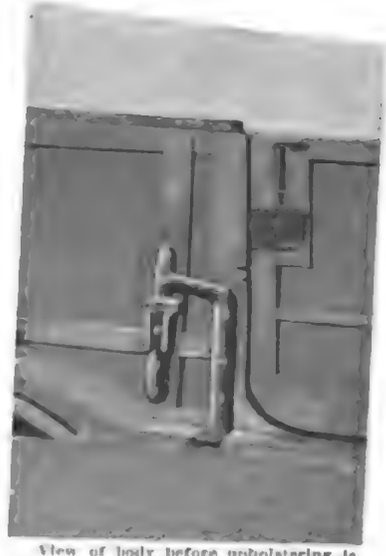
The latest style bullet lamps, with parabolic reflector, furnish a lighting equipment unexcelled for the "35" and SIX. Besides the usual five lamps an electric light has been placed on the dash.

They are all electrically lighted, the current being furnished direct from the storage battery, which, of course, is kept charged by the dynamo, and controlled by a triple push button, located under the cowl of the dash in a convenient position.

The "25" windshield is lighted by a Prest-O-Lite tank leading to large brilliant headlights.

TOPS

The tops are made of carefully selected silk mohair, stretched over combination hickory and steel bows. The straps and fasteners contain many features which make for convenience, and the use of the Studebaker Jiffy curtains adds another feature which all motorists will appreciate.

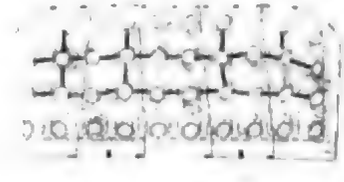


View of body before upholstering is put on, showing the well braced construction and the manner in which the body is ironed for auxiliary seats.





Upholstering and cushions



Shows spring construction of cushions. Special attention is called to extra bracing by means of cross rails and strips of metal improving the seat construction, and preventing it from sagging.

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MOTOR WORLD

Studebaker

December 26, 1912

A Discussion of Studebaker Construction

THE frames are made of basic open-hearth, hot-rolled steel, stamped into channel section with cross members and reinforcement plates of the same material. A drop in the side members for the two larger cars allows the springs to be fastened at a point higher than usual, so that the distance through which the springs can work is materially increased, and at the same time the body is raised enough to allow easy access to the rear axle.

THE SPRINGS

A double scroll ¾ elliptic type of spring on the "35" and SIX, and full elliptic on the "25," shackled at both ends, and lubricated by special spring bolt grease cups, makes the action of the rear suspension particularly free, the rear wheels thus being allowed to accommodate themselves to the irregularities of the road, with alacrity, and without communicating the shock to the body and passengers. A system of semi-elliptic spring in front, fastened to the frame in front, and shackled at the rear, completes the suspension equipment.



This shows top, windshield, dash, steering wheel and dash construction. Note double strip of oak-tanned leather fastened at dash; also clear vision, rain vision and ventilating windshield, braces and adjustment features.

As you will note in the illustration, the rear system is firmly fastened to the end cross-member instead of inserted in or attached to the end of the side-members. This construction is unquestionably superior to other existing types on account of its rigidity and strength.

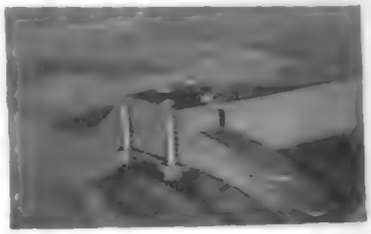
Another point that is worth mentioning is in the ¾ elliptic type, the insertion of a block of wood between the top leaf of the spring and the frame; this block of wood serves as an absorber of vibration and shock, and when desired, can be removed to permit the ready release of the spring.

As in the highest priced cars, the leaves of the spring have small lips formed on either side, which are turned up at right angles to the face of the spring, keep the leaves together, and prevent them from flying out of line on the recoil.

All the spring shackles have grease lubricated shackle bolts operating in bronze bushings; a point which bears emphasis because many makers do not use bushings, but allow the shackle bolts to work in a more or less imperfect hole formed by the spring itself.

All the spring plates are made of the finest oil-tempered steel, accurately fitted and ground. Drop-forged steel pads are used throughout, those on the rear being provided with means for grease lubrication.

Radius rods, the ends of which also operate in bronze bushings, well lubricated, extend from the rear axle housing to the frame cross-member, removing all driving stresses and strains from the springs.



View of end of frame showing manner of supporting the upper half of rear spring. Note that it is fastened to the cross-member instead of to the side member, and that a wood block is placed between the upper leaf of the spring and the frame, making removal of spring easy. This illustration also shows the manner in which the spring leaves are tipped.

THE FRONT AXLES

The front axles are of basic open-hearth steel, drop-forged, and specially heat-treated, according to our formula; tests show that it is capable of carrying many times the load to which the severest service can subject it.

How we know this, and how it is tested, will be described later under the heading of "Our Chemical and Physical Testing Laboratories." The steering knuckles are of basic open-hearth steel, drop-forged, accurately machined and suitably heat-treated; these are carried at each end of the axle, on vertical bolts of large diameter, operating in phosphor bronze bushings, exceptionally well lubricated, to insure easy steering and minimum wear.



Method of fastening carpet on floor of car by means of glove buttons; carpet is sewed on to the bottom of carpet, and not set into the fabric, as is commonly done; no floor connections show on top of the carpet; also, the back of the carpet; also, the floor to top of

Studebaker

THE REAR AXLES

The rear axle of "35" and SIX is of the full floating type; it is enclosed in a housing of open-hearth steel, especially designed and stamped in a unique form that fits it snugly and does away with truss rods, leaky joints and other parts with which many rear axles are encumbered. The upper and lower lips of the housing are made of three thicknesses of steel, giving triple strength just where it is needed.

The differential gearing is carried on two Hyatt roller bearings, supported in turn by two extensions running into the rear axle housing from the transmission case. This construction insures a perfect alignment between the driving bevel pinion and the driving gear at all times. As excessive friction and disalignment at this point means great loss of power at the rear wheels, you will readily see the great advantage of this design.

"25" REAR AXLE

The rear axle of the "25" is of a semi-floating type, having this marked and new advantage that the upper half of the transmission case may be readily removed, exposing the entire transmission and rear axle gear assemblies. Thrust washers are provided to take end thrust on each side of differential so that driving pinion and rear ring gear cannot be thrown out of alignment or bearing surfaces injured.

Load is carried on two extra long high-duty Hyatt roller bearings.

Every part of the rear axle assembly is accessible; both axle shafts, with driving flanges, can be easily removed; the differential may be inspected or removed entirely by the mere unscrewing of a few nuts.

The axle shafts, driving pinion, drive gear, differential bevel gears, are all made of chrome nickel alloy steel, drop-forged, accurately machined, hardened and ground. Particular care has been exercised in the design of all gears and shafts, giving more bearing surfaces and sufficient material for adequate keys and key-ways. How we have determined what these sizes shall be, how many, and what sized keys should be used, under the heading, "How We Check Up Design."

Why we use an axle shaft with six projections around its circumference instead of one with a squared end, will also be explained.

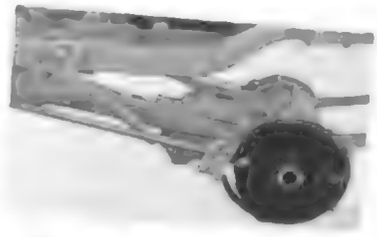
THE MOTORS

The motor design, common to all the new Studebaker cars, is particularly worth your careful inspection, as it contains many new points you will not find on other motors in other cars.

The cylinders are cast en bloc, of special close grained gray iron; the intake, exhaust and water pipes form a part of the cylinder casting, doing away with a great number of small parts, troublesome joints, and gaskets. The carburetor intake passage from the right-hand side of the motor to the inlet valve is fully water-jacketed.

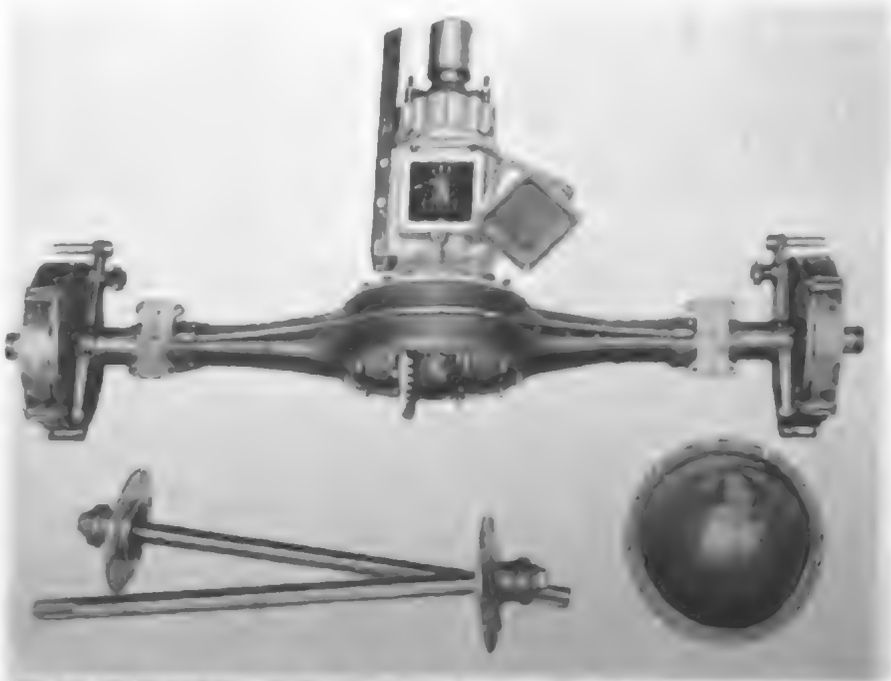
The air and gasoline mixture in consequence is thoroughly vaporized, producing a mixture which ignites readily, and liberates its maximum energy.

The cooling water is taken from the radiator into the cylinder jacket directly around the valve seats, thus preventing trouble from warped and leaky valves, and the consequent loss of power which always accompanies such defects.



View of end of rear axle, showing internal and external brakes, brake mechanism, and upset end of frame. Note the large amount of room between the rear axle and body, allowing for a large deflection of the rear springs. This view also shows the braced steel rear axle, transmission case, and one end of the radius rod.

Studebaker motors on account of their improved construction and enclosed valves run very quietly; you cannot hear the working of the valves at all.



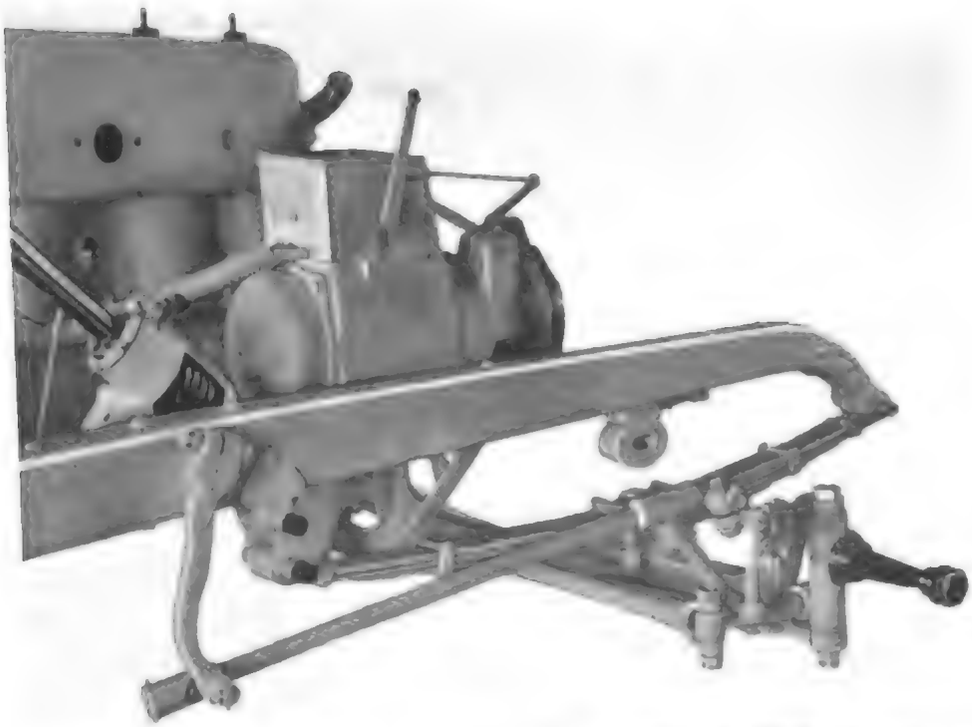
Rear axle and transmission, showing braced steel housing with triple thickness where needed, full floating type rear axle, bevel gear drive, strong, compact transmission and also end of the torque rod.

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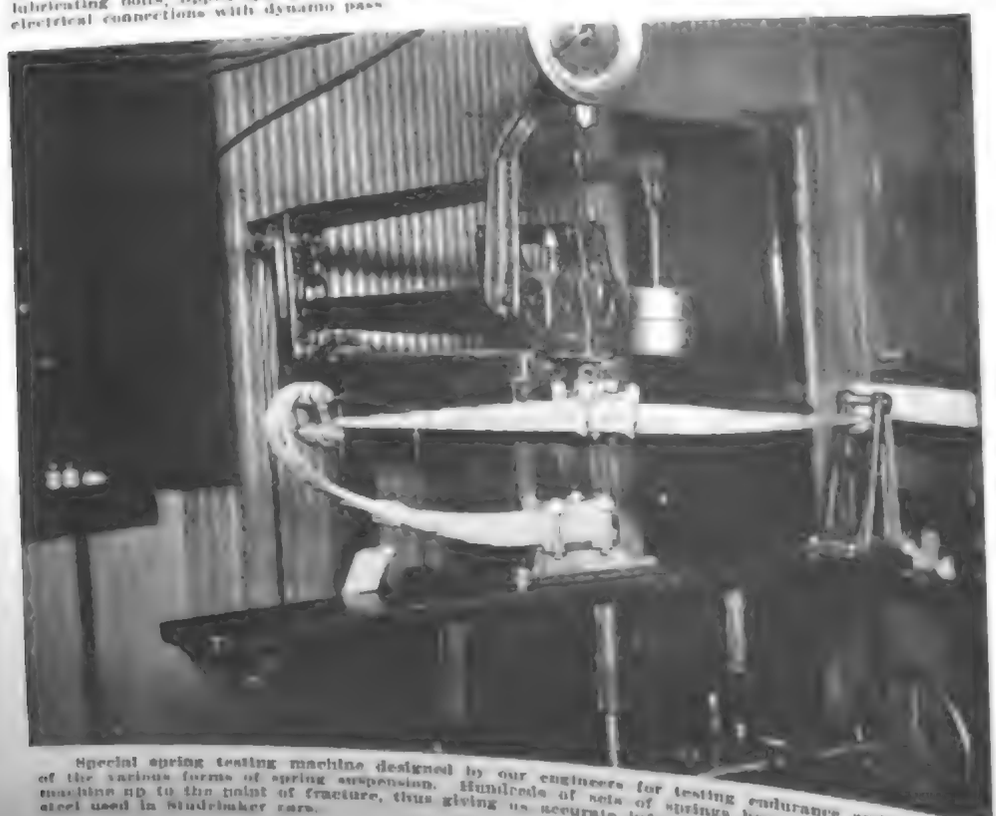
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Front axle construction, showing self starter, steering gear, magneto, steering gear connections, steering knuckle, special speedometer bracket, rubber spring bumper, spring shackle equipped with lubricating bolts, tipped springs, and form of channel section; also, note steel conduit through which electrical connections with dynamo pass



Special spring testing machine designed by our engineers for testing endurance and flexibility of the various forms of spring suspension. Hundreds of sets of springs have been tested by this machine up to the point of fracture, thus giving us accurate information regarding the quality of steel used in Studebaker cars.

THE PISTONS

The pistons also are made of a special close-grained gray iron; the heads are crowned to give maximum strength and minimum weight, and highly polished to prevent the adherence of carbon. This feature is also worthy of special notice as the carbonizing of pistons, although the source of much trouble, has been given but little attention by manufacturers generally.

The mirror polish given to Studebaker pistons, although increasing their cost to a considerable extent, has proved to be an efficient improvement in motor construction and operation. Each piston carries four piston rings, three near the upper end to insure perfect compression and no leakage, the fourth at the lower end to act as an oil wiper, preventing excessive lubrication and its consequent smoking.

Unlike other construction, the piston pins, of high carbon basic, open-hearth steel, hardened and ground, are held rigidly in the upper end of the connecting rod, and operate in bearings of large surface in the piston walls. This excess of bearing surface reduces the wear materially, and makes it seldom necessary for any inspection of this part of the motor to be made.

THE CONNECTING RODS

The connecting rods are made of high carbon, basic, drop-forged and carefully heat-treated steel, according to a special formula.

The lower, or crank shaft bearing, surfaces are made of a special babbitt, which our laboratory engineers specify for this place. These bearings are so set into the retainers that they cannot work loose. The bearing caps are held in place by two special bolts of angle diameter.

Each set of pistons, piston pins, and connecting rods is carefully weighed and balanced to within a quarter of an ounce before being placed in the motor; this balancing operation is very important because, if such balancing is not done, the motor will not run evenly, and especially at high speeds may develop vib...

knocks which are not only disagreeable and troublesome, but detrimental to the mechanism as well.

THE FLYWHEELS

Much care has been taken in the design of the flywheel in the placing of just the right amount of weight at just the right distance from the center to secure a smoothly running motor.

By careful drilling and weighing, it, too, is accurately balanced, both statically and dynamically; that is, at rest and in motion. Some of these points which we have just mentioned constitute features of refinement which are not visible, but whose effect is, nevertheless, plainly to be felt when the machine is being operated. They constitute a strong reason for preferring Studebaker cars.

THE CRANK SHAFTS

The crank shaft is a single drop-forging of high carbon, basic, open-hearth steel, machined, heat-treated, ground and balanced with the greatest accuracy.

It runs in three split bearings of high-grade babbitt, each bearing being provided with ample means for adjustment and liberal lubrication. The SIX crank shaft runs in four bearings.

THE CRANK CASES

The crank case is made in two sections, the upper half cast from a special grade close-grained gray iron for the "25" and "35," and of aluminum for the SIX. The lower half is a one-piece steel stamping of heavy gauge metal designed to carry oil distributing tubes, oil dip pans, and act as an oil reservoir for the lubricating system.

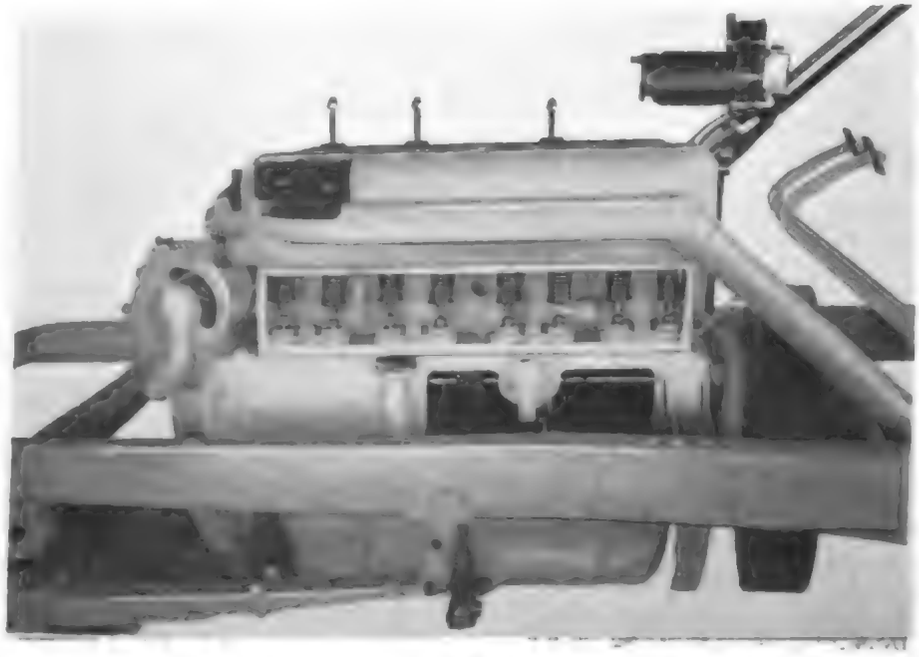
THE VALVES

The valves of larger size are all mounted on one side of the cylinder casting, and the mechanism is entirely enclosed in a dust-proof compartment, which, however, can be easily inspected by the removal of a plate held in place by two bolts fitted with lever nuts.

Everything possible has been done to



Looking at the front of Model 35 motor, showing cross shaft with helical driving gear, water pump, water pump connections, magneto, self-starter, silent chain for driving same through motor support, and general form of construction. Note universal joints in pump, and magneto drive shafts, and adjustable fan support.



Motor sections showing valves, valve seats and inlet and exhaust passages; also, interior of pump and crank case. Note the manner in which valves are enclosed, and in the center of the hole through which hot air from the carburetor is sucked directly from the valve compartment, thus doing away with any possibility of getting dirt into the carburetor, and insuring warm air at all times. At the upper right-hand corner the coil and sight feed that go on the dash are also shown. Note the manner in which a portion of the exhaust pipe is eliminated by making it a part of the cylinder casting. A good view of the fly-wheel and clutch and brake pedals are also shown. The small standpipe showing the level of oil in the crank case will also be noticed in the foreground.

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insure the elimination of wear, noise and trouble. The valve heads are drop-forged from basic, open-hearth steel, and electrically welded to high carbon steel stems. This combination has been found to be desirable as the open-hearth steel successfully resists heat and is not liable to pit, while the high carbon steel stems have been found to be best suited for wear and to give great rigidity. That our decision is right has been proven by the very satisfactory results that these valves have given in high-speed racing and long endurance contests.

The push-rods that operate the valves are of high carbon, basic, open-hearth steel, machined, hardened and accurately ground; they are carried in cast-iron bushings, pressed into the cylinders, and are actuated by one cam shaft; a screw and lock-nut of the most approved design allows them to be delicately adjusted.

Marks on the flywheel accurately spaced at the proper distances make valve timing an easy operation.

IGNITION

The Splitdorf dual system of ignition, consisting of a low tension magneto and auxiliary battery of four dry cells, is used. A coil fitted with the latest style of dash switch is mounted under the hood, and the wiring is carried through insulated flexible steel and hard rubber conduits, to Splitdorf mica insulated spark plugs.

As will be seen from the illustration, the magneto is mounted in front of the motor, and is driven by transverse shaft, operated by helical gears.

All wiring, the magneto and coil are fully protected from dirt and moisture by an easily removable waterproof cover.

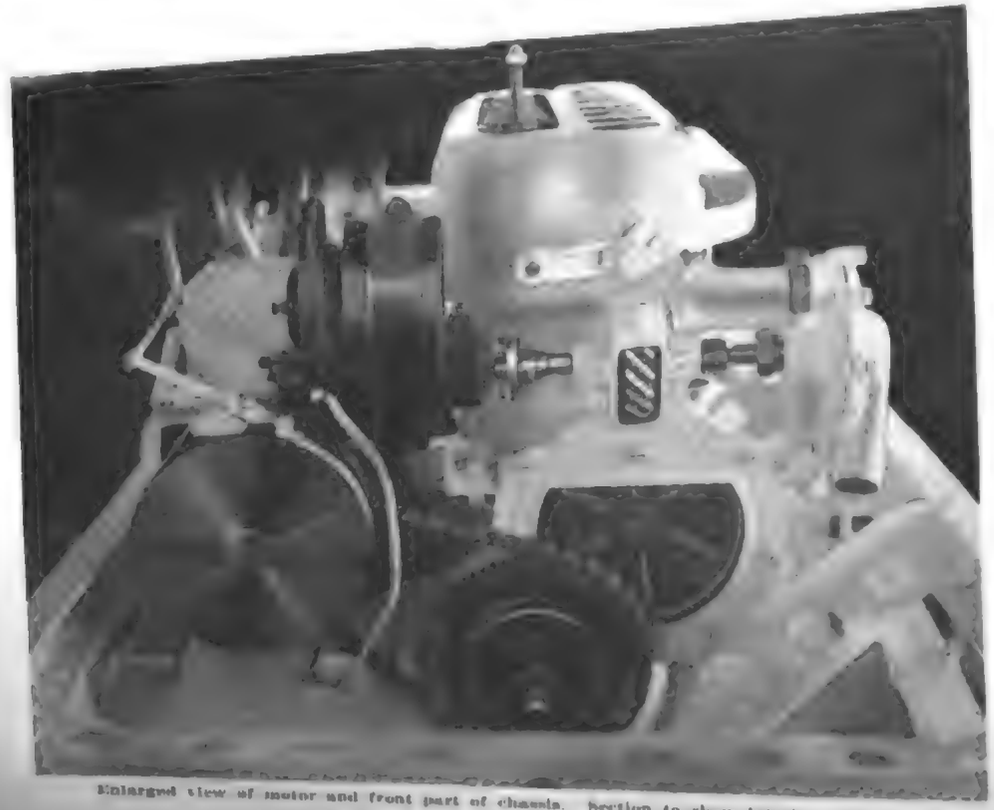
The entire wiring equipment, which runs inside the body, is installed and inspected before the upholstering is put on.



Fly-wheel, clutch and front universal housing.

No pains have been spared to make the entire electrical equipment thoroughly trustworthy.

We do not take the manufacturers' word for it, but test every piece of material, every terminal, every magneto, every coil, every wire and every switch that goes into the ignition construction.



Enlarged view of motor and front part of chassis. Section to show interior mechanism.

LUBRICATION

Studebaker cars are equipped with the combined splash and pump circulating system.

Oil is taken from the reservoir in the bottom of the crank case by a pump driven from the cam shaft, and constantly delivered through tubes to the timing gears and pockets in the dip pan underneath the crank shaft. When the motor is running the oil is pumped from an oil reservoir in the bottom of the crank case through a sight-feed on the dash, and, after distributing itself over the timing gears, finally drains back into the crank case again. A strainer prevents any dirt from entering the oiling tubes.

The amount of oil in the crank case reservoir may be ascertained at any time by glancing at the gauge located near the filler pipe.

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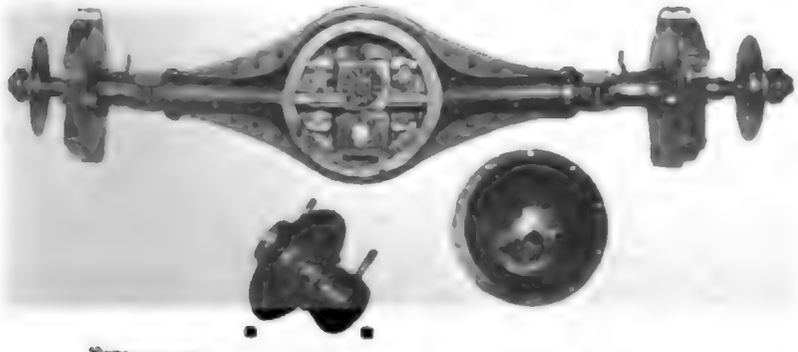
Showing interior construction

As only the surplus oil goes through the sight-feed there is always sufficient warning given before the reservoir is empty, so that no damage can be done from lack of lubricating oil. The quantity of lubricant and the method of its distribution have been so accurately calculated that there is no possibility of the motor smoking. Another advantage of the system is that fresh oil is constantly furnished to the timing gear case, completely flooding this mechanism, and almost entirely eliminating any wear and noise at this point.

COOLING SYSTEM

A McCord tubular radiator in the "25" and "35" and a Livingston Honey Comb in the SIX, through which the water is forced by a centrifugal pump, maintain the cooling water at the proper temperature under all conditions. The cars literally cannot overheat.

The system has a large water capacity, and on account of the ample water jacket space and piping used, is very efficient.



Shows ease with which the differential and large bevel can be removed.

The air circulating fan is mounted on a bracket on the front of the motor in such a way that the belt by which it is driven may be easily and quickly adjusted.

THE CLUTCH

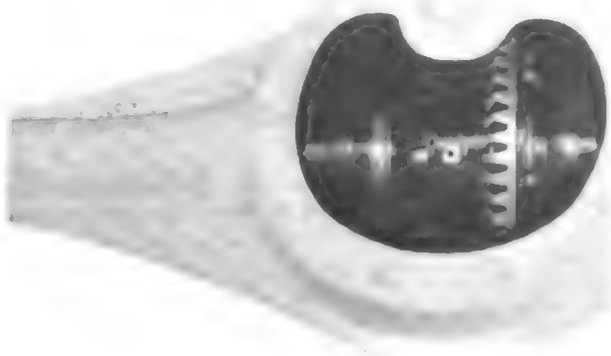
The clutch is of the leather-faced type.

The cone is a one-piece steel stamping, well ribbed for stiffness.

The clutch-hub is a steel casting with phosphor bronze bearing on the crank shaft.

The contact between the clutch-cone and flywheel is maintained by a highly tempered coil spring which exerts a pressure of about 80 pounds.

The system of foot levers is so designed that very little pressure need be exerted on the foot pedal to release the clutch.



Differential with oil-tight cover removed.

Beneath the clutch leather is a series of flat springs that hold up the leather at several points, making the clutch engage easily and smoothly.

TIMING GEARS

The timing gears are of the helical type, cut with a 20-degree pressure angle, and long addendum type tooth, designed especially to give very quiet action and great durability.

The pump and magneto shaft gear is of the same type, set at right angles and meshes with the cam shaft gear.

This entire gear assembly is enclosed in an oil-tight case, and runs in oil.

PROPELLER SHAFT

The drive from the clutch to the trans-

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View in large drop forge plant where all forged parts of Studebaker cars are made. There are over 250 drop forgings in each car whereas the usual number used by most makers does not exceed 140.

mission is through the propeller shaft of chrome nickel steel, especially heat-treated.

Front and rear universal joints, with all parts of basic, open-hearth, drop forged steel, and phosphor bronze bushings, are provided. Both are entirely enclosed by a newly designed dirt-proof and oil tight covering, insuring clear, well lubricated universal joints.

A torque arm, bolted solidly to transmission case at the rear end, and secured to a cross-member of the frame at the front end by a system of springs, fully protects the gears and driving shafts from road shocks and undue strains.

TRANSMISSION

The Transmission is of the selective sliding gear type, three speeds forward, and one reverse. All gears are 6/8 pitch, cut with a 14½ degree pressure angle, hardened and accurately ground. The countershaft is of large diameter, and carried on two plain die cast bearings with large flanges to take the thrust.

The forward drive shaft is of chrome-nickel alloy steel, hardened and ground, and is carried by two annular ball bearings.

The rear drive shaft is of chrome-nickel alloy steel, hardened and ground, and is carried at the front end in a phosphor bronze type of bearing, drilled and grooved for lubrication, and at the rear end is carried in a Timken improved roller thrust bearing.

A specially designed ball bearing is also located at this point to take care of any additional thrust that may develop.

The drive pinion is secured to the rear drive shaft in a taper fit with a Woodruff key and a castellated nut.

The sliding gears are maintained in position by a ball and spring lock arrangement and corresponding grooves in the rear shift rods.

This arrangement, together with the improved control system, keeps the gears in mesh regardless of road conditions.

The transmission parts are all contained in a two-piece cast aluminum case, bolted to the rear axle housing.

SPECIALLY DESIGNED GEARS USED

The driving teeth gear used in Studebaker cars are very different in shape to those used by other makers. They have a special form of tooth, which was invented



One of the Studebaker Foundries.

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by one of our men, and later developed in our Laboratories. They are absolutely silent in their operation and wonderfully efficient.

DUST PANS

The dust pans are steel stampings, and are made in three sections, the front and rear fastened permanently to the frame; the middle section is held up by specially designed lock to facilitate its quick removal and replacement at any time.

Every precaution has been taken to give a sufficient amount of ventilation.

THE STEERING GEARS

The steering gear is on the right-hand side, and is of a positive worm and worm gear type, absolutely irreversible; in other words, a movement of the front wheels, such as that caused by striking obstacles in the road does not cause the steering wheels to rotate.

By using a wheel instead of a mere sector it is possible to reset the gear in four different positions, so that in the case of wear a new surface can be quickly presented.

To gain great steadiness, the steering is fore and aft; that is, the reach rod from the steering gear operates directly on the right-hand steering knuckle lever, and moves parallel to the frame.

The steering wheel is an aluminum spider with a bent wood rim of large diameter.

The spark and control levers are carried on the sector at the top of the steering column, and an accelerator pedal is also provided for handling the throttle in crowded traffic where it is desirable to keep both hands free.

CONTROL

The control levers, located on the right hand side, are made of drop forged, heat treated steel, and will not break as combination steel and brass levers sometimes do.

The emergency brake lever works in conjunction with an improved inverted type of sector.

Electric switches for operating the electric lights and ignition system are conveniently located on the dash within easy reach of the driver.

THE BRAKES

The brake construction on Studebaker cars is unique and very expensive to make.

Designed with a large factor of safety they are constructed so that they will hold equally well forward or backward.

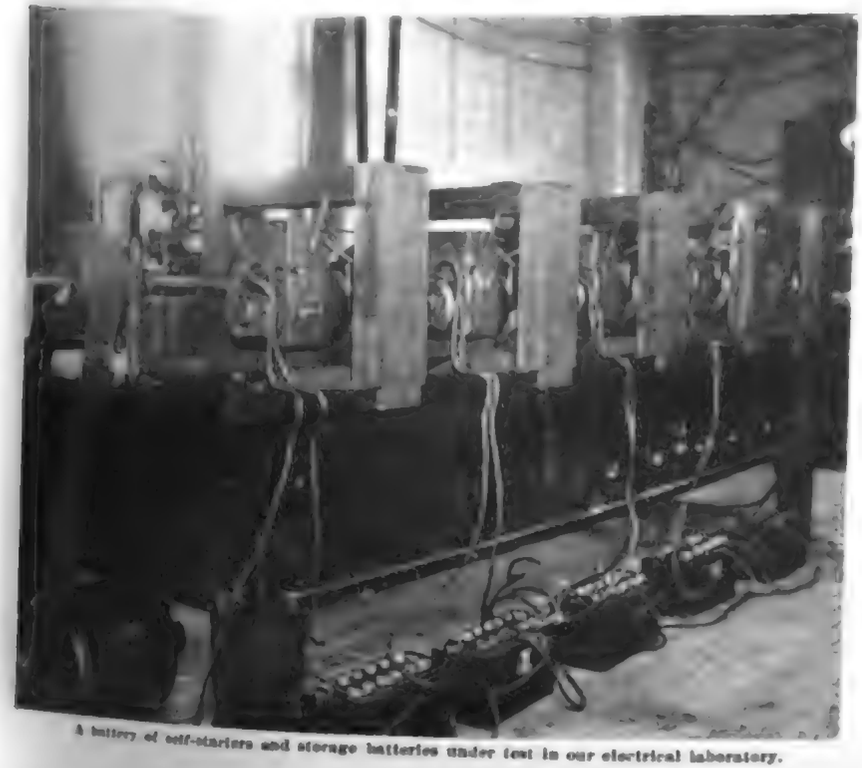
They consist of two sets, both of which operate on brake drums on the rear hubs, the emergency brake being controlled by a hand lever, the operation of which expands an internal shoe.

The service brake, operated by a foot pedal, is of the external band type, the inner surface of which is covered with an asbestos composition lining. The emergency brake has a metal to metal contact, with very large braking surface.

A special spring release prevents the brakes from dragging, a defect which is noticeable in some other cars.

THE WHEELS

Artillery wheels, equipped with demountable rims, and Goodrich Q. D. tires are used.



A battery of self-starters and storage batteries under test in our electrical laboratory.

ELECTRIC SELF STARTER

An electric starter of the motor generator type, especially designed for the Studebaker Corporation, and manufactured by the Wagner Electric Manufacturing Company, of St. Louis, is included as regular equipment on the "35" and SIX. Acting on the crank shaft through a silent chain, it is capable of turning the motor at 80 r.p.m. for a period of 30 minutes. A Willard 50-ampere hour, 12-volt battery, used in connection with the starter, supplies the lighting system, and is automatically and continuously charged by the starter, which runs as a generator after the motor starts.

A flexible cord runs from the starter controller to a handle on the steering post within easy reach of the driver. To start the motor, you merely pull this handle.

As soon as the motor begins to fire, the starter automatically changes its function to that of a generator.

We show in one of the illustrations a battery of these self-starters under test in our electrical laboratory.

No maker has a more complete method for testing than we have.

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Studebaker

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Distinguishing Characteristics

THE STUDEBAKER "25"

The Model "25" is one of the most remarkable values ever produced.

We know of no other low-priced car which is manufactured under such favorable conditions and in factories exclusively devoted to high-class manufacture.

As we have said before, in nearly all its details, it is exactly like the higher priced types; being especially noteworthy on account of its simplification of chassis design.

It has, however, full-elliptic springs, and a semi-floating rear axle, which is equipped with thrust bearings to take up the end thrust and in which the construction is such that the gears cannot get out of alignment.

The transmission differs slightly from the two other cars, but is equally strong and accessible.

The driving torque is taken up by a torsion tube surrounding the propeller shaft.

The motor develops 26 horsepower on brake test. The touring car fully equipped with all tanks filled, weighs 1,950 pounds. The car has extraordinary power and has already made a great record as a hill-climber, and under the most severe road conditions. Its equipment is liberal, as will be seen by referring to the table of specifications.

The "25" has a 3½" bore by 5" stroke, 4-cylinder motor, 102" wheelbase, and 30 x 3½" tires. It sells for $885.00.

For equipment, models and prices, see detail specifications.

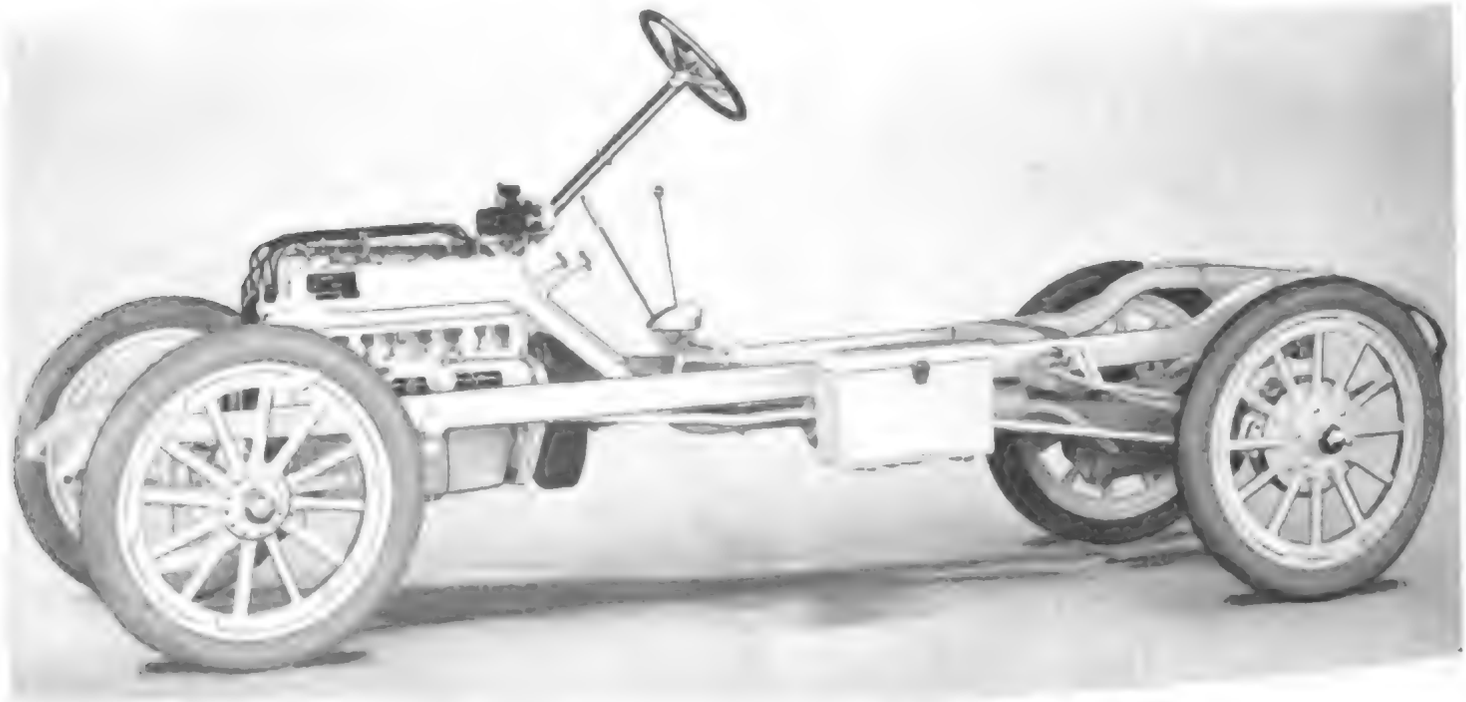
THE SIX

The "Six" has a 3½" bore by 5" stroke, 6-cylinder motor which develops 40 horsepower on brake test. The upper half of the crank case is composed of aluminum, in order to save weight. The radiator is of the honeycomb type. In all other respects the "Six" is typical of the general Studebaker design. The weight of the "Six," with all tanks filled, is 3,000 pounds.

It is built on 121" wheelbase with six passenger body, and is equipped with 34 x 4" Goodrich tires.

The announcement of a six-cylinder car of undisputed high-grade at $1,550 is an achievement which marks a memorable point in the advancement of the automobile industry.

For equipment, models and prices, see detailed specifications.



View of special Model 35 chassis section to show interior mechanism of motor and axles.

STUDEBAKER "35"

The Model "35" is equipped with a 4⅛" bore by 5" stroke, 4-cylinder motor, and has 116" wheelbase.

The actual horsepower delivered on brake test is 35, and the car weighs 2,850 pounds fully equipped with tanks filled.

The "35", we believe, is absolutely unapproached by any car selling within $500 of its price of $1,290. It fills the eye, a big car, of distinguished lines, comfortable, roomy and equipped with an excellence and attention to detail which has never before been shown in a moderate priced car. If you would like a $2,000 car, buy the $1,290 Studebaker "35." At every joint it is as good or better than many cars of good reputation for which you are asked to pay a much larger price.

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Studebaker

Complete List of Studebaker Cars

The cars here announced are *additions* to our line. We shall continue to manufacture the famous Studebaker (E-M-F) "30" and Studebaker (Flanders) "20," than which no better cars of their class were ever built.

"SIX" Touring Car	$1,550
Roadster	1,550
Limousine	2,500
"35" Touring Car	1,290
Sedan Type	2,050
Coupe	1,850
"30" Touring Car	1,190
"25" Touring Car	885
Roadster	885
"20" Touring Car	885
Roadster	835
Delivery Car	800

All prices for cars fully equipped, f. o. b. Detroit.

A Word About Studebaker Service

Few automobile manufacturers have what may be called a truly efficient service department.

Many claim to have, but investigation has shown that in most instances it falls very far short of being ideal. A large number of service stations are necessary to keep an efficient service department in successful operation, to give customers proper attention, to insure the rapid filling of orders, and a speedy adjustment of claims.

The Studebaker Corporation, like few other organizations, is happily in a position to handle such matters promptly. 2,500 Studebaker branches and dealers dot the country.

Hardly a city of any size can be found in which there is not a Studebaker representation.

It is for this reason that we have been able to lay out, and put into successful operation a plan for taking care of Studebaker owners in a generous way that is second to none in ultimate usefulness. It has always been our policy to do this.

Our enormous business and our reputation for honesty and fair dealing has come as a logical result of such policy.

Naturally we are jealous of such a reputation, and intend, therefore, to maintain it at any cost. A careful, consistent conservatism, combined with a progressive policy towards our purchasers, will, we believe, enable us to do it.

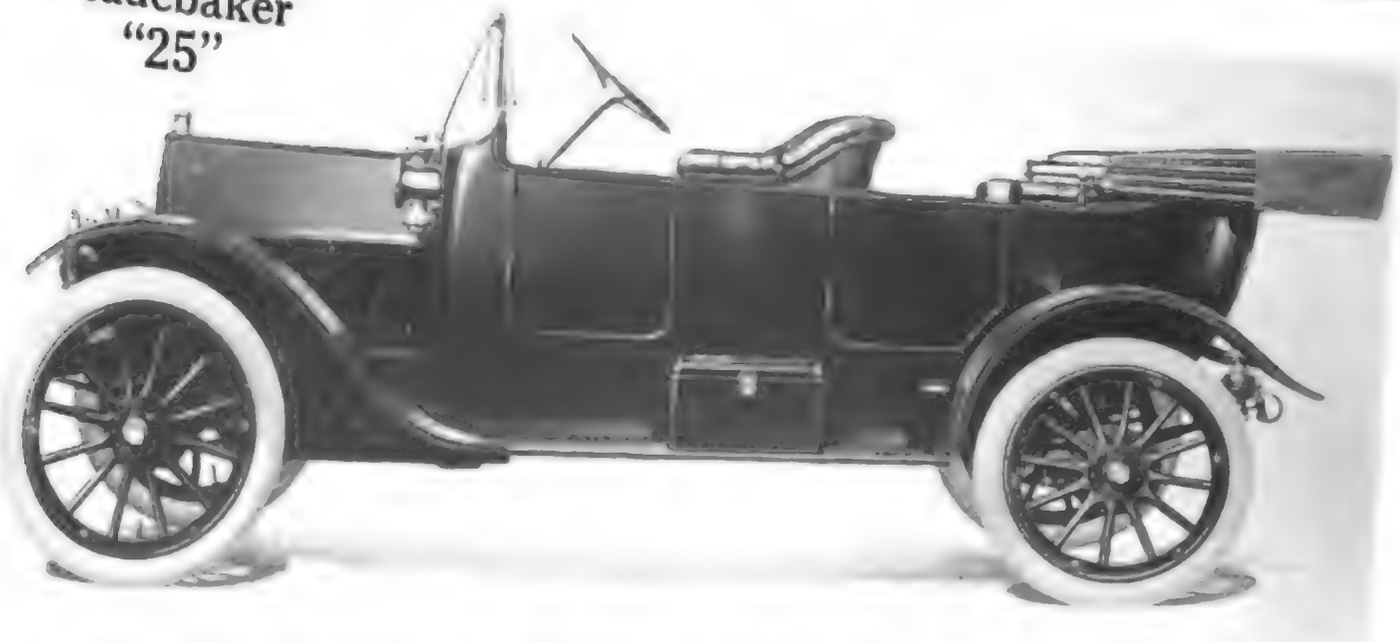
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MOTOR WORLD

Studebaker

December 26, 1912

Studebaker "25"



Five-passenger, four cylinders, long stroke, 3½-inch bore x 5-inch stroke, 102-inch wheelbase

With 30x3½ inch Goodrich tires, Demountable rims, Extra rim, Tire holders, Electric horn, Acetylene gas primer, Prest-O-Lite tank, Tire repair kit, Ventilating windshield, Silk mohair top, Studebaker Jiffy curtains, Deep cushions, Stewart & Clark Speedometer, Full elliptic springs, Tool box, Full set of tools

$885

Studebaker "35"



Six passenger, four cylinders, 4⅛-inch bore x 5-inch stroke, 116-inch wheelbase

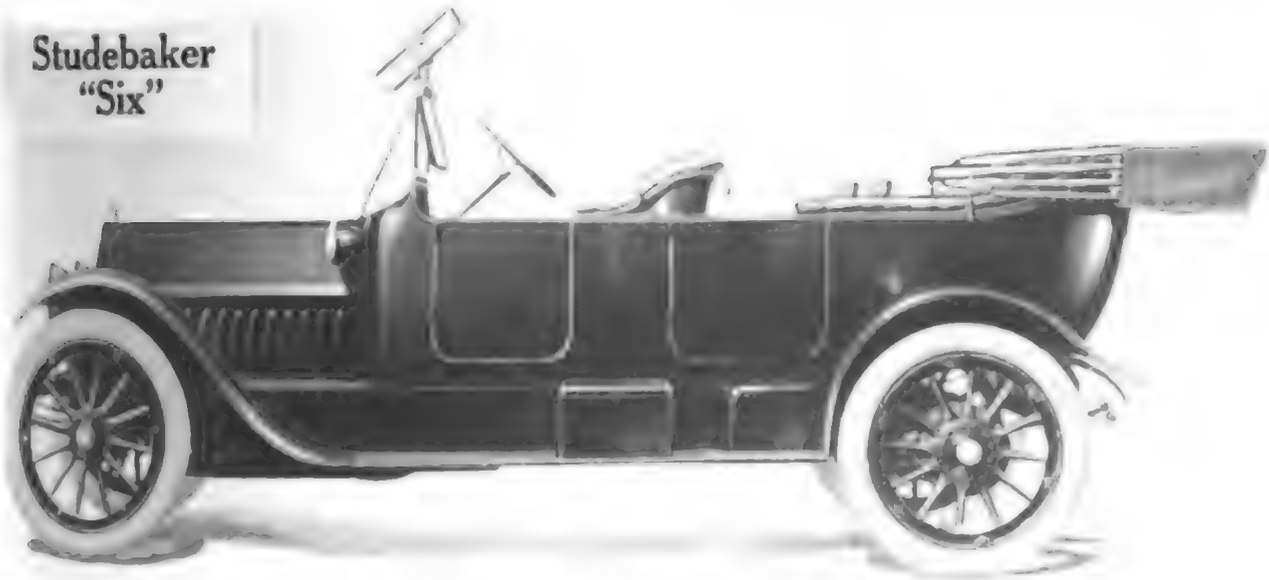
With Electric self-starter, 34x4 inch Goodrich tires, Detachable, demountable rims, Extra rim, Tire holders, Electric lights, Stewart & Clark Speedometer, Three-quarter elliptic springs, Full floating rear axle, Electric horn, Silk mohair top, Studebaker Jiffy curtains, Luxurious upholstery, Deep cushions, Clear-vision ventilating windshield—rain-vision type, Full set of tools

$1,290

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Studebaker

Studebaker "Six"



Six-passenger, six cylinders, 3½-inch bore x 5-inch stroke, 121-inch wheelbase

With

- Electric self-starter
- 34x4 inch Goodrich tires
- Detachable, demountable rims
- Electric lights
- Extra rim
- Tire holders
- Stewart & Clark Speedometer
- Three-quarter elliptic springs
- Full-floating rear axle
- Electric horn
- Silk mohair top
- Studebaker Jiffy curtains
- Luxurious upholstery
- Clear-vision ventilating windshield—rain-vision type
- Special tool box
- Full set of tools

$1,550

Studebaker Limousine "Six"



Price Complete, $2,500

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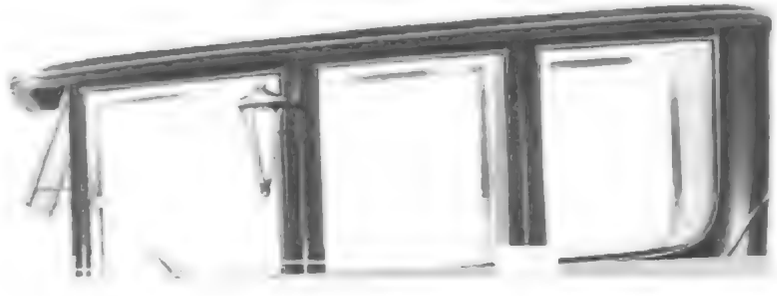
Studebaker

Studebaker Coupe "35"



Price Complete, $1,850

Studebaker Sedan "35"



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Studebaker

The Closing

IN the preceding pages we have discussed at length some of the important features and some of the little known characteristics which make Studebaker automobiles the extraordinary values we believe them to be.

We make this claim for every Studebaker Car—that in quality of material, in method of manufacture and in skillful workmanship, Studebaker automobiles are not excelled by any cars built, no matter what the price.

This claim is justified because it is true. With every car we sell goes a pledge of business honor which rests upon sixty years of Studebaker success and fair dealing.

We have told you a little about these cars because we hope above all things, that every prospective buyer will make a most searching examination of the car he proposes to buy. Studebaker cars are honest down to the last detail of construction and they will reward a buyer with years of satisfying service. Think over these things and take an opportunity to see for yourself the marvelous values which you will find in Studebaker automobiles. You will see them at all the shows and at the salesrooms of our dealers.

The Studebaker Corporation

Detroit, Mich.

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Studebaker

Studebaker Branches and Supply Depots

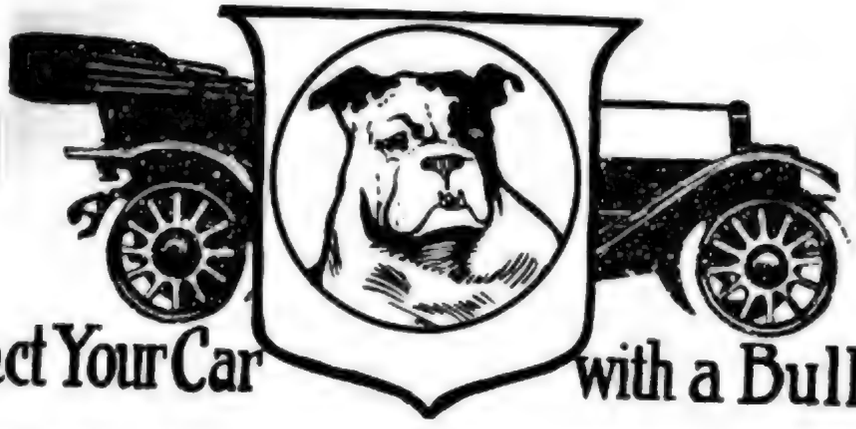
Atlanta	114-116 Auburn Avenue
Birmingham	2029 Avenue "C"
Boston	Lawton Ave. and Cummington St.
Buffalo	1021 Main Street
Charlotte	224 North Tryon Street
Chicago	21st and Michigan Avenue
Cincinnati	815 Race Street
Cleveland	700 Canal Road
Columbus	264 North Fourth Street
Dallas	1513 Commerce Street
Dayton	224 North Main Street
Denver	1515 Cheyenne Place
Detroit	513 Woodward Avenue
Fargo	224 Broadway
Indianapolis	309-315 North Pennsylvania Ave.
Kansas City	1620 Grand Avenue
Los Angeles	1620 East 7th Street
Louisville	4th and York Streets
Memphis	249 Monroe Avenue
Minneapolis	2d Avenue South and 6th Street
New York	Broadway and 59th Street
Norfolk	
Oakland	
Oklahoma City	7 West Main Street
Omaha	2026 Farnum Street
Philadelphia	18th and Noble
Phoenix	4th Avenue and Jackson Street
Pittsburgh	Forbes Field
Portland	Chapman and Alder Streets
Salt Lake City	157 State Street
San Antonio	
San Francisco	Mission and Fremont
Sacramento	
Seattle	2201 2d Avenue
Sioux Falls	124 West 10th Street
South Bend	Administration Building
Spokane	1032 Sprague Avenue
St. Louis	4300 Duncan Street
Stockton	417 East Weber Avenue
Tacoma	1129 Tacoma Avenue
Toledo	1101 Madison Avenue
Washington, D.C.	118 Q Street Northeast

Canadian Factory—Walkerville, Ontario

Canadian Distributing Centers

Calgary, Alberta
Edmonton, Alberta
Hamilton, Ontario
Halifax, Nova Scotia
Montreal, Quebec
Ottawa, Ontario
Quebec, Quebec
Regina, Saskatchewan
St. Johns, New Brunswick
Saskatoon, Saskatchewan
Toronto, Ontario
Winnipeg, Manitoba
Vancouver, British Columbia
Victoria, British Columbia

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Protect Your Car with a Bulldog



BULL DOG AUTO LOCK

Progressive Dealers

Will be alive to the sales possibilities of this device, which is by long odds the best insurance against theft, joy riding and meddlers generally.

The Bull Dog Auto Lock is one of the necessities that is "a little worker with a big mission to perform," and to see it is to want it. Dealers have proved this by the number of sales they have made and are making.

This safety device is simple in construction, easy to attach and detach, neat in appearance, and has the tenacity of a bull dog. It will fit all modern cars that have a sliding gear transmission.

Write and get our proposition to you. The retail price is $2.50, small enough to make sales come easy and large enough to give you a liberal commission.

CONSOLIDATED MACHINE WORKS
1636 Wentworth Avenue Chicago, Ill.

THE *NEW* KING

AT THE SHOW
Don't fail to see this splendid car at the Grand Central Palace, New York, Section No. 133, Mezzanine Floor

Has These Nine Big Selling Features

* Patent KING Cantilever Springs which absorb all shocks; assure the car a LONG, ECONOMICAL LIFE, and make it THE "COMFORT" CAR OF THE WORLD. * Long Stroke Motor. * Unit Power Plant. * Center Control. * Left Hand Steer. * 18 inch Steering Wheel. * Full Floating Rear Axle. * Three-point Suspension. * Complete Electric Light Equipment.

These are "High Priced Car" features yet the *NEW* KING sells for

$1095

TWO STYLES—ONE CHASSIS
TOURING CAR and ROADSTER

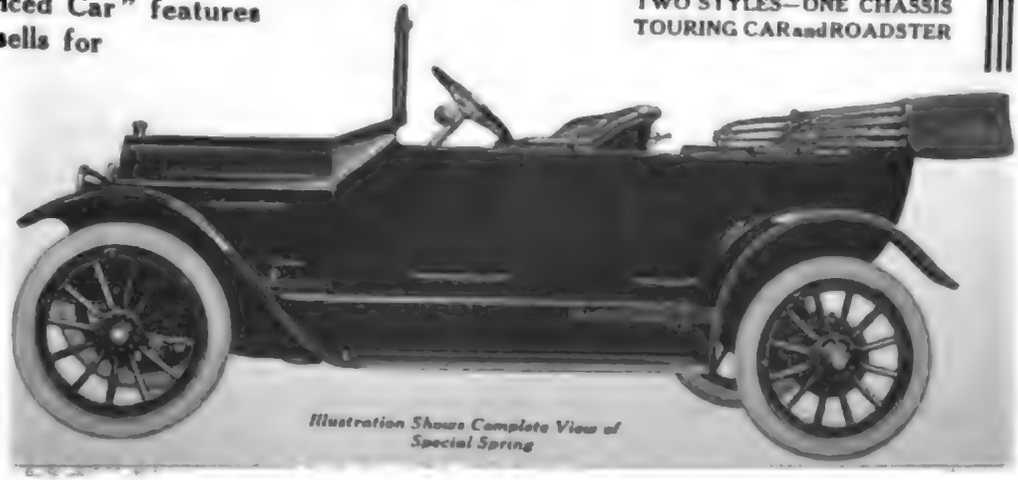


Illustration Shows Complete View of Special Spring

Write for complete description and special proposition to dealers

KING AUTOMOBILE CO.
Successors to King Motor Car Co.
1300-1334 Jefferson Ave.
DETROIT, U. S. A.

The Hollenden
Cleveland

★Serving as the all-the-year-round headquarters and home of the Cleveland Automobile Club, is particularly well prepared to give its metropolitan service to all the motor world. Especial appointments have been provided for automobilists and the automobile trade in general.

★Most accessible by reason of its location, THE HOLLENDEN is content to stand upon its record in the matter of high-grade service. Intelligent care for the needs of the public, personal interest in their smallest wants and tireless efforts to supply their every requirement combine in establishing the service which has made and retains so many loyal friendships for this house.

★Improvement of established merit are going forward as fast as installation can be made. Important additions in keeping with this establishment and its reputation are nearly completed.

★One may well doubt if in the entire list of metropolitan hotels there is one which offers so many attractions and conveniences, so enjoyable a combination of advantages at sensible prices as

The Hollenden
Cleveland

Hotel Cumberland

Broadway at 54th Street, New York

OFFICIAL HOTEL:

Automobile Club of America
American Automobile Ass'n



Near 50th Street Subway Station, 53d Street Elevated and all Surface Lines

"Broadway" Car from Grand Central Depot Seventh Avenue Car from Pennsylvania Station. Convenient to Both Shows

NEW AND FIREPROOF **STRICTLY FIRST CLASS**

Rates Reasonable---$2.50 With Bath, and Up
Excellent Restaurant --- Moderate Prices

TEN MINUTES' WALK TO 30 THEATRES

Send for Booklet **HARRY P. STIMSON** *Formerly with Hotel Imperial*

OUR EXHIBITS, THIS YEAR,

New York: Madison Sq. Garden, Space 178, Elevated Platform
Chicago: Coliseum, Space 21, Gallery

WILL BE OF UNUSUAL INTEREST

BE SURE AND VISIT OUR BOOTH



27TH STREET PLANT—OVER EIGHT ACRES UNDER ROOF

IN ADDITION TO OUR STANDARD LINE OF FRAME SHAPES AND MISCELLANEOUS PRESSINGS AND FORGINGS, WE ARE SHOWING THE

New Whitney Differential Roller Bearing and New Models Front and Rear Axles

A. O. SMITH COMPANY, Milwaukee

Every Business Man Can Use an International Commercial Car

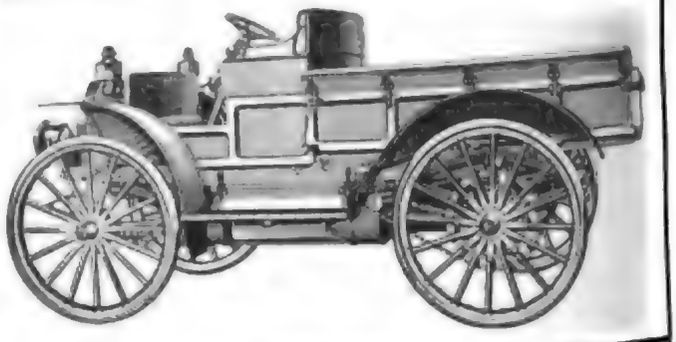
To the man who sells automobiles, the International Commercial Car presents an interesting and attractive proposition. It occupies a field of its own. The fact that a man already owns an automobile makes him a better prospect for an International Commercial Car, especially if he is a farmer or a business man who does light hauling or makes deliveries.

Better Than Horses

The International Commercial Car is more reliable than horses. It works long hours without rest. It travels over roads where mud, sand, snow, or ice would make it cruel to drive horses. It is a better investment than horses.

Less Expensive

The International Commercial Car costs less than horses and wagons to do the same amount of work, and the up-keep cost is less. It costs nothing when not working. It does not require so much care as horses. It is a money-saving proposition for a business man from every point of view.



Strictly a Commercial Car

It does not compete with pleasure cars. It is strictly a commercial car, whose size, power, shape, transmission, tires, road clearance, construction, price—all are the result of years of experience in building a car to prove satisfactory for light hauling and quick deliveries in the hands of average drivers.

This is the Car We Ask You to Sell

Can you do it? If you think you can, our proposition will interest you. Better write for it anyway and see just what we have to offer. Address

International Harvester Company of America
(Incorporated)
155 Harvester Bldg. CHICAGO, U. S. A.

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Croxton

Croxton cars incorporate all of the features for which the buyer looks in the new models. Write for catalog and agency details.

The Croxton Motor Car Co.

Washington, Pa.



Sale of All the Properties of

United States Motor Company
Alden-Sampson Manufacturing Company
Brush Runabout Company
Columbia Motor Car Company
Dayton Motor Car Company
Maxwell-Briscoe Motor Company

Pursuant to decree of the United States District Court for the Southern District of New York, the properties of the above companies will be offered for sale in Room 47 of the Post Office Building, Borough of Manhattan, City of New York, on

January 8th, 1913

Sealed bids will be received by receivers at their office, Broadway and 61st Street, Manhattan, N. Y., up to 10 A. M. January 8, 1913. Bids will be announced January 8, 1913, at 11 A. M., in Room 47, P. O. Building, Manhattan, N. Y. Thereupon bidders, qualifying pursuant to terms of decree of sale, may bid further until 3 P. M. of that day if and as may be permitted by the Court. For copies of decree of sale giving terms, conditions and particulars as to bids and sale and for all further information reference may be made to the undersigned. Bidders should inspect the decree of sale.

W. E. S. STRONG
ROBERTS WALKER Receivers.
Broadway and 61st Street, Borough of Manhattan, New York City.

ROSENBERG & LEVIS,
Solicitors for Complainant,
170 Broadway, Borough of Manhattan,
New York City.

THINK THIS OVER very carefully and read it twice, if necessary.

Is there any part of an automobile engine, or any other gas engine, that is more important to its efficiency than a Valve?

Your engine leaves the factory running smoothly and sweetly—tuned up to its highest power. Perhaps the valves pit—warp—go out of shape—fail to hold compression. Then the power diminishes, and what can be more aggravating to the driver, who has known the fullness of the pulling power of his motor, than to have it grow less and less?

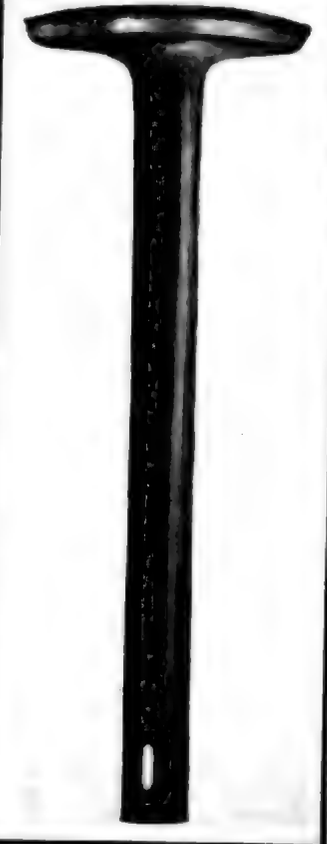
You cannot slight this part by putting in an inferior product—valves that will give trouble, or even break from inexperience in their manufacture—valves of unsuitable material, not suitably heat treated.

Too much is at stake, and a slight extra cost at the outset, which is the exception, may save you many times over a probable later expense.

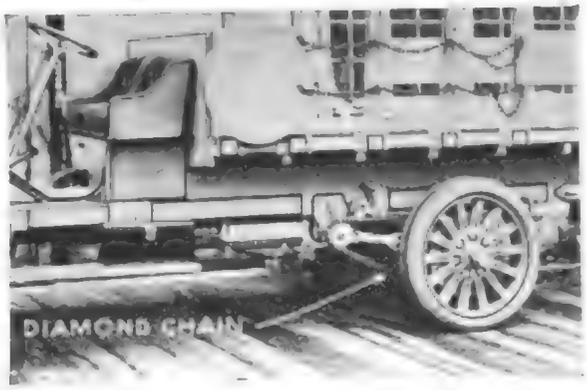
This Company, with the experience of many years as a guarantee, will furnish you with properly made valves, of the materials best adapted to your requirements.

Not only QUALITY, but efficient SERVICE is a factor—surely there is a satisfaction in getting the kind of work you want—when you want it.

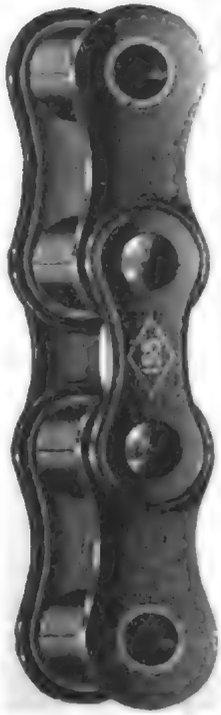
THE ELECTRIC WELDING PRODUCTS COMPANY
CLEVELAND, OHIO



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Prominent make of truck equipped with DIAMOND CHAINS



This picture shows one of the General Motors Truck Company's 2½, 3½ and 5 ton trucks equipped with Diamond Chain.

When prominent manufacturers specify Diamond Chain as standard equipment they must have a reason and it is in their service records that this reason is disclosed.

Diamond Chains have proved in every test the essential qualities of strength and durability, which can only be possible with the strictest attention to material and construction. All rivets in our heavy duty chains are nickel steel. All holes in side bars are reamed accurately to size and pitch—giving an even and perfect bearing not possible with simply a punched hole.

In our treatise "Power Chains and Sprockets," there is valuable engineering information on the subject of Chain Drives for Trucks. We have a limited number of these books for free distribution. Write now and secure a copy.

Look for the

TRADE ◇ MARK

DIAMOND CHAIN AND MANUFACTURING CO.

155 W. Georgia Street Indianapolis, Ind.

CAPACITY 6,000,000 FEET PER YEAR

SAMPLES SUBMITTED

(139)

Add $10 to $25 Profit to Each Automobile Sale

Here's an easy way to pick up an extra Ten or Twenty Dollar Bill whenever you sell an automobile.

Just send us the name of the purchaser and we will endeavor to sell him an Edwards Private Portable Steel Garage.

That's all we want you to do—merely furnish us the name.

You Invest No Money or Time

It means $9.25 to $20 profit **FOR YOU** on each sale. And you've no money or time invested. Send us a list of all automobile owners in your locality, and on this plan you'll make a nice, clean profit—perhaps several hundred dollars.

The Edwards is far and away the most popular and widely advertised Private Garage. Our prices are much lower than others. And we've an excellent system of following up all names received. We won't miss any opportunities to close sales.

Write Us Now Send us your list of local auto owners at once or we will be glad to answer any questions.



Edwards Fire-Proof Garage

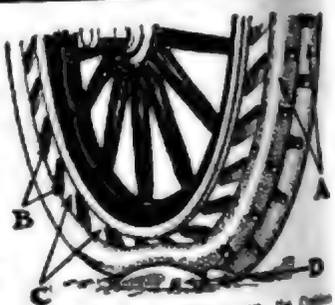
An artistic, fire-proof steel structure for private use. Gives absolute protection from sneak thieves, joy riders, fire, lightning, accidents, carelessness, etc. Saves time, work, worry and trouble. Comes ready to set up. All parts cut and fitted. Simple, complete directions furnished. Absolutely rust-proof. Joints and seams permanently tight. Practically indestructible. Locks securely. Ample room for largest car and all equipment. Made by one of the largest makers of portable fire-proof buildings. Prompt, safe delivery and satisfaction guaranteed.

The Edwards Mfg. Co., 709-759 Eggleston Ave., Cincinnati, O.

Easy-Riding Tires That Never Cause Trouble

Motz Tires are as easy-riding and shock absorbing as properly-inflated pneumatics, yet never puncture or blow out. They also end dangerous skidding and waste of power. Guaranteed for 10,000 miles—two years. Easily applied to any standard clincher, universal quick-detachable or demountable rim. Adopted as standard equipment by all leading makers of pleasure electrics.

Note their patented shock-absorbing construction—the double, notched treads, (A); the undercut sides, (B); the slantwise bridges, (C); the absorbing qualities when passing over an obstruction, (D).



ONE USER'S EXPERIENCE

The most convincing proof of this tire's worth is the experience of users. Here is what Rev. M. P. Boynton, Pastor of Lexington Avenue Baptist Church, Chicago, under date of October 14, 1913, wrote us:

The Motz Tire & Rubber Co.,
2023 Michigan Ave., Chicago.

Gentlemen:—Between three and four years ago I put Motz Cushion Tires upon my Electric Runabout. It at once increased the mileage by increasing the speed from twelve to fifteen miles an hour and reducing the amperage from thirty-five to twenty-eight in normal conditions. I discovered that though the motor is carried on the back axle with no spring support, the Cushion Tires did it no harm.

The heavy back tires particularly seem to last forever. I disposed of the machine some months ago, having used those tires for over three years, and they seemed to be in as good condition as the day they were put on, barring the slight wear on the duplex face of the tire. Very respectfully,

(Signed) M. P. BOYNTON.

Send for copy of handsome Tire Book, No. 28. Please give make and model of your car and size of rim.

THE MOTZ TIRE & RUBBER CO., Factories and Executive Offices **Akron, Ohio**

BRANCHES: 1737 Broadway, New York; 2023 Michigan Ave., Chicago; 4 Dundee St., Boston, Mass.; 999 Woodward Ave., Detroit; 1823 Euclid Ave., Cleveland; 300 N. Craig St., Pittsburgh, Pa.; 60 East 13th St., Kansas City, Mo.; 1400 Race St., Philadelphia, Pa.; 338 W. Pico St., Los Angeles, Cal.

SEE OUR EXHIBIT AT THE NEW YORK AUTOMOBILE SHOW—SPACE NO. 208, BALCONY MADISON SQUARE GARDEN

Motz Cushion Tires

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Guide



Electric Headlights

The first thing an owner notices about a Guide lamp is the powerful light it gives.

The dealer notices this but he also notes that users of Guide lamps have no kicks coming.

Guide lamps make good.

The Guide line is a good line.

We are ready with Guide Book No. 6, our 1913 catalog, plenty of electros and other dealer helps.

Better get in touch with us.

THE GUIDE MOTOR LAMP MFG. CO.
CLEVELAND, OHIO

Gurney Ball Bearings

Sustain greater loads and outwear all others, WHY? Because they have raceways of more perfect contour than all others.

Will take greater thrust load because they have full depth and uninterrupted raceways with full complement of balls



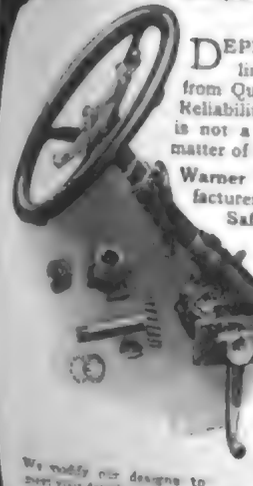
Our Radio-Thrust Bearings will sustain 100 per cent radial or 100 per cent thrust load or a combined radial and thrust load.

Interchangeable with all standard makes.

Something new and valuable. Write for particulars.

GURNEY BALL BEARING COMPANY
JAMESTOWN, NEW YORK

Efficient-Reliable Steering Gears



DEPENDABILITY and Reliability are inseparable from Quality. In steering gears, Reliability is of vital importance. It is not a matter of money—it's a matter of safety.

Warner Steering Gears, Mr. Manufacturer, are your best pledge of Safety, which means a Big Asset in your business. You are justified in using them by our eight year old reputation for building the highest grade steering gears produced.

Besides, we give you prompt and dependable deliveries, service and satisfaction. Write.

We modify our designs to meet your detail requirements, or build to approved designs on standard assembly specifications.

Detroit Office
Philadelphia Office
Glenwood Av. and 2nd St.

Warner Gear Co.
Muncie Indiana



Bull Dog Quality Auto Top Fabrics

are the STANDARD of the world

NUMOTOR top cloth is a line that will interest everybody. It is a little different than anything you have yet seen. It is made in Bull Dog quality. The tops never leak, fade or pull out of shape. The seat covers hold their shape, can be cleansed and do not wear out; neither do they shine or wear out your clothing.

Send for samples and prices.

See our exhibit at Madison Square Garden, Space 554 in the basement.

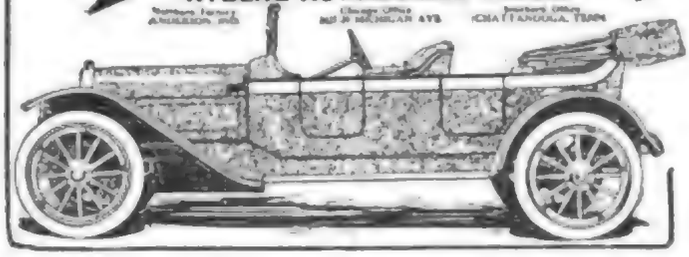
L. J. MUTTY CO., Boston, Mass.

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Nyberg SIX $1750

ANNOUNCING 1913 TOURABOUT
Complete Specifications Sent on Request

NYBERG AUTOMOBILE WORKS



Standard Universal Rims



fit any style or make of tires. The side rings are reversible, they curve outward on one side to fit a straight side tire, inward on the other to accommodate a clincher. Two turns of a nut unlocks the rim for demounting, two more turns locks the rim in place. Write for catalog 607, which explains fully.



THE UNITED RIM COMPANY, Akron, Ohio

BENZ

Since the introduction of BENZ cars to the motoring public of America no car has attained such world-wide supremacy as to its construction, standing up quality, and material. The new type of 35 and 50 H. P. BENZ models are the last word in automobile construction.

The noticeable features of this type of BENZ cars include the offset crank shaft, smokeless oiler, and SILENT CHAINS instead of timing gears.

The BENZ Carrosseries are noted for their beautiful lines and thorough comfort.

To those desiring AGENCY of this car the Benz Company will offer special terms. We want RELIABLE, ENERGETIC agents to further our interests for both BENZ pleasure cars and BENZ-GAGGENAU trucks, which today stand recognized by those who know, as the leading 6-ton truck. Wire or write us, no matter where you are.

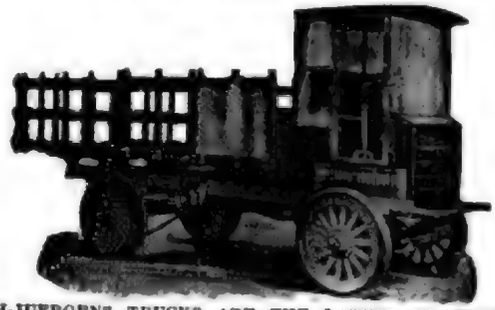
Our PRICES compete with LEADING AMERICAN makes.

BENZ AUTO IMPORT COMPANY OF AMERICA
250 West 54th Street New York, N. Y.
Direct Branch of Benz & Cie., Mannheim, Germany.

Lauth-Juergens

Lauth-Juergens Trucks are Delivery Insurance

QUALITY DURABILITY
ONE, TWO AND THREE TON CAPACITY



LAUTH-JUERGENS TRUCKS ARE THE LATEST IN CONSTRUCtion, most powerful in operation and the motors are guaranteed against defective workmanship and material for the life of the truck. They are positively the highest class trucks made. Two cylinder, one-ton, four cylinder, one, two and three-ton. Four speeds forward. Hess-Bright ball bearing transmission made in our own shops of the finest tool steel, three-piece disc clutch, covered by patents owned by us. Send for 1912 Catalog and specifications. Prompt delivery on all models. Large publicity campaign just begun. Our quality will do the rest.

Reliable Agents: Secure Your Territory for 1912 at Once.

The Lauth-Juergens Motor Car Co., Fremont, Ohio.

Branches and Agencies

BOSTON—David Abrams, 131 Portland St.
NEW YORK—West Side Garage & Motor Co., 160-162 101st St.
CHICAGO—The Lauth-Juergens Motor Car Co., 2830-32 Wabash Ave.
NEWARK, N. J.—Merchants Motor Car Co., Essex Building.
DETROIT, MICH.—Bierl Auto Truck Sales Agency, 453 Dix Ave.
DISTRICT OF COLUMBIA AND VICINITY—Bowles Motor Sales Co.

Wagon and Automobile Body Plant

Receiver's Public Sale
Tuesday, January 14, 1913, 2 p. m.

The plant of the Fitzgibbon & Crisp Carriage and Wagon Co., located in the heart of Trenton, N. J., including Land, Buildings, Machinery, Stock, Fixtures, Work Finished and Unfinished, and all Personal Property except Book Accounts.

The plant has been profitably operated by the Receiver since June, 1912.

Sold subject to a mortgage or lien of $40,000 represented by a bond issue maturing in 1922 (not in default) and (the Sinking Fund created for the retirement of the bonds is worth about $17,000). City Taxes due to amount about $2,000.

Terms: 10 per cent purchase price Cash, balance upon delivery of deed after Confirmation of Sale by Court.

Further information upon application to Receiver.

A LIVE GOING ACTIVE PLANT

Receiver Fitzgibbon & Crisp Carriage and Wagon Co.

Trenton, New Jersey


MEZGER
Soot Proof
Spark Plugs
GENUINE
E.A. Mezger
SOOT-PROOF
THE SOOT PROOF
PAT MAY 13 1902
Can't Soot
Can't Short Circuit
Can't Leak
Can't Break Down
Next Three Pages
Tell Why



MEZ Soot PARK

All spark plugs are the "best" if you want to put your seal of approval on every advertised, but unproved, claim that goes into print, but—

It's quite another matter if you are inquisitive concerning the "reasons why" back of such advertising.

This advertisement is directed to inquisitive dealers and manufacturers.



One of the Oldest Spark

WHY THEY ARE SOOT PROOF

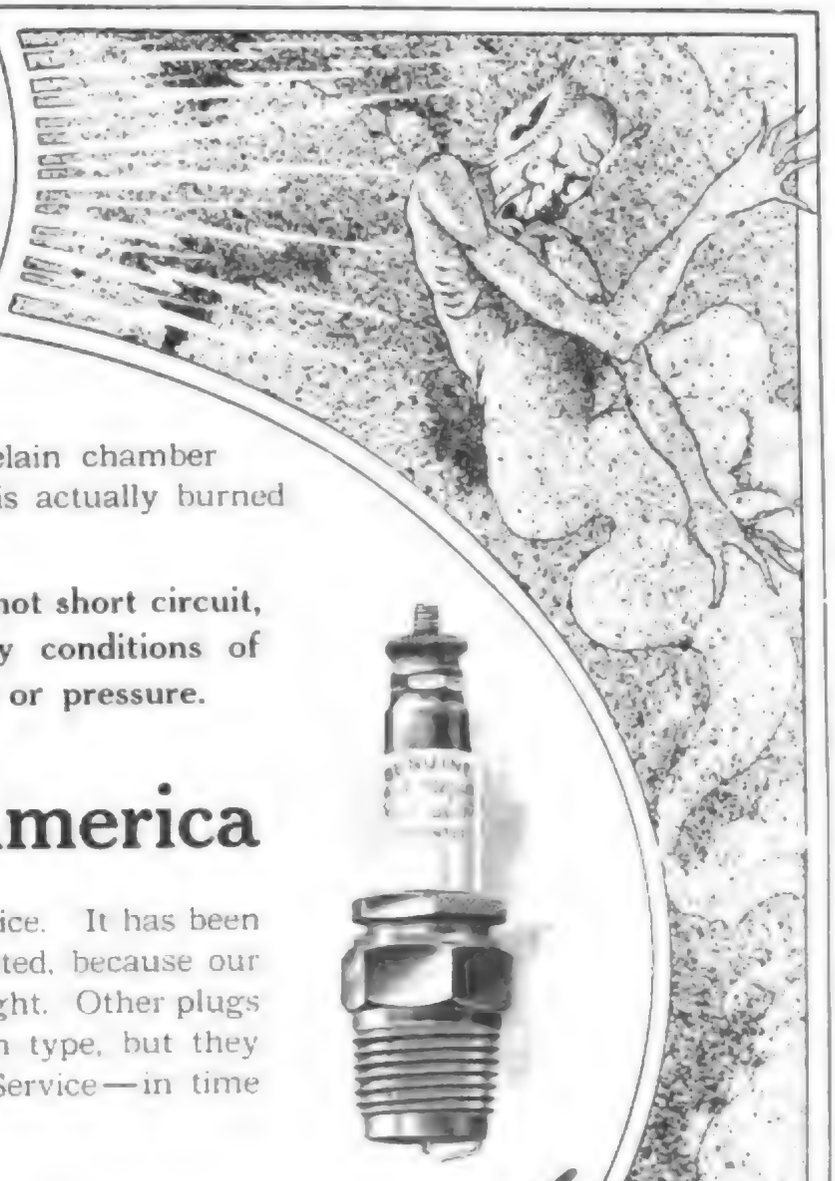
We began making these plugs in 1900 and we **started right** by breaking away from the solid porcelain design which was warranted to develop "carbon distemper" every seven or eight miles.



We originated the double chamber idea which gives a large area of carbon surface inside and outside the porcelain, making a path of resistance several times greater than that in any other plug—**the current must take the path of least resistance**—the air gap.

Perfect Electrical &

GER Proof PLUGS



The small diameter of the porcelain chamber radiates heat so rapidly that carbon is actually burned up as fast as formed.

Mezger Soot Proof Spark Plugs cannot short circuit, leak, collect soot, clog—under any conditions of speed, temperature, excessive oiling or pressure.

'lug Makers in America

We own the basic patents on this device. It has been half way but never successfully imitated, because our double chamber principle is radically right. Other plugs are better than the old solid porcelain type, but they fall far short of Mezger Soot Proof Service—in time and satisfaction.



Insulating Features



Dealers

Good Spark Plugs Hold and Make Trade



DEALERS

In these days of mediocre demand and wholly unreliable automobile parts and accessories it s a wise dealer who holds and builds trade through the selling of satisfactory goods—and the car owning public is quick to accept the opinions and recommendations of such dealers.

How much dead stock have you, Mr. Dealer—just in spark plugs alone, for instance? Have you loaded your shelves with advertised but unproved goods, and tied up a lot of money? Why not handle spark plugs that ***have made good*** through service?

Mezger Soot Proof Spark Plugs can be handled exclusively by you—they are in demand—you can create more demand.

One of the Oldest Spark Plug Makers in America

In justice to yourself—in justice to your trade—for the commissions we offer—you ought to sell MEZGER SOOT PROOF SPARK PLUGS.

Net prices to the trade and full detailed information will be mailed on request. Write for them.

C. A. Mezger, Inc., 15 Canal Place, Bronx Borough New York City

Oakland

"The Car With A Conscience"

Write for 1913 Catalog

FOUR AND SIX CYLINDER MODELS

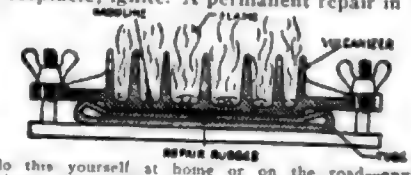
$1000 to $3000

OAKLAND MOTOR COMPANY

250 Oakland Boulevard PONTIAC, MICH.

How to Repair an Inner Tube in 15 Minutes

Directions: Place tube between plates of the **Imperial Vulcanizer** (see cut); tighten thumbscrews; put a little gasoline in pronged receptacle; ignite. A permanent repair in 15 minutes.



You can do this yourself at home or on the road—anywhere. The Imperial Vulcanizer saves time, saves money, is easy to operate, and pays for itself in a short time.

PRICE, $3.50
NICKEL PLATED
Patent Pending

Complete with enough rubber for 40 punctures. At your dealer's or sent by express.

Guaranteed to Satisfy or Money Refunded

McGRAW TIRE & RUBBER CO., Dept. E, East Palestine, Ohio

Insure the Safety of Your Car by Using

TRADE MARK
Raybestos
REG. U.S. PAT. OFF.

"THE ORIGINAL AND BEST ASBESTOS BRAKE LINING"



THE ROYAL EQUIPMENT COMPANY

136 Housatonic Ave. Bridgeport, Conn.

We also make Duplex and Raymond Brakes and Gyrex, the Mixer.

30% More Mileage — Save The Tires



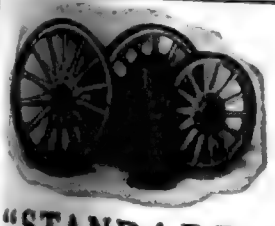
Every automobile owner and every dealer has been interested in watching our National advertising of Tirenew. The big demand it has created means profit to the dealer.

Prevents Tire Decay

It is a liquid vulcanizer (rubber compound) made with a base of pure gum—waterproofs and protects from oil, moisture, sun and air. *Makes Tires Look Like New.* There are imitations which paint but don't protect. Insist on Tirenew. Send $1.00 for a can—enough to Tirenew 8 tires. Ask about our other products.

Narco Rubber Reviver | Non-inflammable Rubber Cement | Leakanot, a liquid rubber, waterproofing dressing for anything leather.

NATIONAL RUBBER COMPANY, 4413 Papin St., St. Louis, Mo.



Ready for 1913

"STANDARD" WHEELS

FOR PLEASURE OR COMMERCIAL CARS
One Passenger to 16 Tons Capacity

Send for Catalog No. 15

STANDARD WHEEL COMPANY, Terre Haute, Ind.

SEE The Inter-State Cars

New York Show—Jan. 11th-18th, 1913
Space 29 Grand Central Palace

Chicago Show—Feb. 1st-8th, 1913
Space Q3 Coliseum Annex

Boston Show—March 8th-15th, 1913
Spaces 135 and 141 Main Floor

INTER-STATE AUTOMOBILE CO.
2412 First St., Muncie, Ind.



RAJAH GIANT PLUG

Extra strong and heavy. Perfectly simple—only four parts, which are easily taken apart for repairs or replacement. Only highest grade, imported, hard fire porcelains used. Minutely accurate, well finished machine work. No thumb screws—a Rajah Clip Terminal supplied with every Plug. Price, $1.50 postpaid—the most economical Plug made. Send for catalog.

RAJAH AUTO SUPPLY CO., Bloomfield, N.J.

THE NEW PROCESS RAW HIDE CO.

Cut Gears of Quality
Complete Differentials

THE NEW PROCESS RAW HIDE CO.
SYRACUSE, N. Y.

THE NEW PROCESS RAW HIDE CO.

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American
AXLES



Write today for our booklet

THE AMERICAN BALL-BEARING COMPANY
Cleveland, Ohio

Any Kind
Every Kind
Stock, or
to Blue Print

Rims

Clincher
Q. D.
Demountable
Channels

For Automobiles, Motor Trucks, Aeroplanes, Motorcycles, Bicycles.

We Also Make Axles and Hubs.

MOTT WHEEL WORKS, Utica, N. Y.
R. B. ABBOTT SALES CO., Sales Agents, Detroit

The Motor Lamps with Distinctive Features

There are no other motor lamps on the market with the advantages of Solar Lamps. Solars are always exclusive in style and in quality. They are the strongest lamps as well as the most effective.

In no other lamps can you obtain the Solar Special Short Focus Lead Glass Lens Mirror Reflector—the patented system of double ray light projection which gives two distinct fields of light for town and country use—or the new and exclusive black finish with a metallic lustre which is unaffected by heat or moisture. All of these features are exclusively "Solar."

Do not equip your car or specify equipment to the maker until you have seen all of the Solar advantages. See Solars at any live dealer's or write for the catalog.

Solars are made in all styles for oil, electricity, gas and in combinations.

Solar Lamps

BADGER BRASS MANUFACTURING COMPANY
Kenosha, Wis. (137) New York City



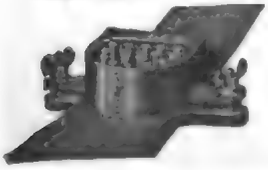
Patent "Luxury" Folding Seats

Do you wish to make your car more comfortable by installing a pair of auxiliary seats? If so, have the best. Our seats are made in five styles. Send for catalogue.

HODGE & GRAVES CO.,
Amesbury, Mass.



Repairing Casing



TIRE CUTS ruin casings. They admit moisture to the carcass, cause the fabric to rot and weaken, grow larger—end in blowouts.

You can repair **CASINGS** and **INNER TUBES** anywhere in 15 minutes, better than a Repair Shop can do—and for *one cent*.

Universal Auto-Vulcanizer
Patented

A practical vulcanizing outfit complete, with enough repair gum to make 40 patches. It weighs 3 pounds and can be carried in the tool box. **Simplest and most satisfactory device for eliminating tire troubles that has ever been devised.**

Absolutely automatic. Place the patch—attach the Vulcanizer—put in the gasoline—light it. No further attention required. In 15 minutes the job is done.

It *can't burn, scorch* or *injure* tube or casing. It *can't* get out of order. It *can't* fail to do its work. So simple, anyone can operate it. The Universal Auto-Vulcanizer saves its cost a *hundred times* over in trouble and expense.

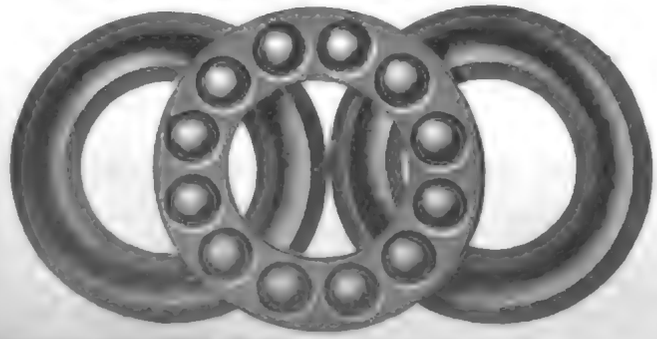
Price Complete, **$4.00** Ready for Instant Use
Guaranteed Satisfactory or Money Refunded
ADAMSON MFG. COMPANY, East Palestine, Ohio

The Kentucky Thoroughbred
"AMES 45"

Long stroke, powerful Continental Motor—Electric (Dynamo) Lights—Self Starter—Left Hand Drive—Full Equipment—"Amesbuilt" Bodies and Tops. A combination of power, speed, endurance and graceful lines. Price, fully equipped, $1,635. This is 1913's most remarkable car value. Backed by a reputation of 30 years it will win you from the first inspection. We have a most liberal proposition for good, live agents. Send for catalog.

AMES MOTOR CAR COMPANY, Owensboro, Ky.

WE MAKE THE BEST



BANTAM ANTI-FRICTION CO., Bantam, Conn.

The Reasons for Jencick Quality and Jencick Prices are worth knowing.

JENCICK MOTORS
For Motor Trucks

from base to spark plug, have features that are "Different and Better."

JENCICK MOTOR CORPORATION
Port Chester, New York

Drop Hammer Forgings

cost very little more than castings. They are vastly superior and less expensive in the end.

WE ARE SPECIALISTS

in producing

DROP HAMMER FORGINGS

from special analysis steel.

Send prints of parts you will need in

1913.

QUALITY AND SERVICE GUARANTEED

THE CONSOLIDATED MANUFACTURING COMPANY, Toledo, Ohio

Better Than Commercially Perfect

GEARS Bevel Differential Transmission Steering

$3,000,000 in plants affording the most superior facilities for fine work; also hardening and treating of the finished product. Most thorough inspection and testing system. Our own laboratory.

Brown-Lipe-Gear Chapin Company

H. W. CHAPIN, Gen'l Mgr. SYRACUSE, N. Y.

The Kinsey Manufacturing Company

TOLEDO, OHIO

Manufacturers of Auto Parts, Kinwood Radiators, Fenders, Kinwood Oilers, Gaskets, Kinwood Steel Frames, Etc.

SPECIAL METAL STAMPINGS

Ford

THE UNIVERSAL CAR

We have had to double our gigantic output—and the demand is more than doubling. Nearly 180,000 have been sold and delivered. New prices $525 to $800. Dealers everywhere. Ford Motor Company, Detroit, Michigan.

FEDERAL TIRES "EXTRA SERVICE"

Federal Rubber Manufacturing Co. Milwaukee

Look at our new middle name

PENNSYLVANIA Oilproof VACUUM CUP TIRES

PENNSYLVANIA RUBBER COMPANY

Dominion: Coast to Coast. Jeannette, Pa.

The Otho SYSTEM for Self Starting Lighting Ignition Signalling

Is right Inside the Flywheel

Otho Motor Co., 60 State St. Boston, Mass.

METZ "SPECIAL" $395

Completely equipped, fully guaranteed. 22½ H.P., 4-cylinder water-cooled motor, Bosch magneto. Artillery wheels, best quality 30" x 3" clincher tires. Makes 5 to 50 miles per hour on the high speed, 28 to 32 miles on 1 gal. of gasoline. You can secure EXCLUSIVE SALE in your territory. Send for Book "B"

METZ COMPANY, Waltham, Mass., U. S. A.

75% Increase in Tire Efficiency

That's what the INNERSHU accomplishes. It's a tough, durable, rubberized fabric formed permanently to tire shape. Ask for circular.

INNER SHOE TIRE COMPANY

Front Street Grand Rapids, Mich.

The Ford Water Circulator

forces the water from radiator through cylinder water jacket, maintaining rapid circulation when car is in motion. Write for descriptive matter if you handle Ford cars.

THE FULTON-McCUTCHAN CO.

1146 Michigan Ave. CHICAGO, ILL.

INVADER OIL

"The Best the World Affords"

CHAS. F. KELLOM & CO.

Philadelphia Boston

FIAT "THE MASTER CAR"

6 Cyl. 50 H. P., $5,000 4 Cyl. 55 H. P., $4,500

4 Cyl. 35 H. P., $4,000

(Completely Equipped)

FIFTEENTH YEAR

POUGHKEEPSIE F.I.A.T. N. Y.

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POLSON
Quality Windshields

Auxiliary Seats, Bumpers and Gas Starters

POLSON MANUFACTURING CO., Buffalo, N. Y.

SIMMS MAGNETO
"American Made"

NOW READY FOR THE TRADE

Highest Efficiency – Good Service Guaranteed

THE SIMMS MAGNETO CO. 1786 Broadway, N. Y. City Factory, Bloomfield, N. J.

"National" Steam Vulcanizers

GARAGE MODEL repairs three tubes and two casings at a time. Cheapest and best on the market. Get our special selling plan. Portable model for individual owners which will please your customers. List price, $12. Manufactured by

THE NATIONAL MOTOR SUPPLY CO.

1964 Euclid Ave. CLEVELAND, O





These Tires for You

Four corps of experts working in four of the best equipped tire plants in the world are operating as a unit to produce.

UNITED STATES TIRES

Nothing of the kind has ever before been attempted in automobile tire manufacturing.

United States Tire Company
New York

The Bush Radiator

THE BUSH MANUFACTURING CO.
HARTFORD, CONN.



GUARANTEED AUTOMOBILE SPRINGS

Our plant is devoted exclusively to the manufacture of high quality springs. All work is oil tempered and warranted. Our circulars contain valuable information. Write.

PENN SPRING WORKS
BALDWINSVILLE, N. Y.



SPRING COTTERS
of
Steel, Brass and Copper

Manufactured by
F. P. SMITH & CO., Sharon Hill, Pa.

ARGO ELECTRICS

METZGER-HERRINGTON ARGO CO.
Distributors

2412 Michigan Avenue, Chicago, Ill.
Factories, Saginaw, Mich.

A Car That Is ALL Car

No finicky frills—no false valuations—merely a compact, efficient, mechanical success—and incidentally one of the most beautiful cars ever built. Write today for advance Booklet A-15 Sturdy STUTZ Announcement, Series B.

IDEAL MOTOR CAR COMPANY, Indianspolis, Ind.



RELIANCE
"The Speedometer of Quality"

Special features that eliminate speedometer troubles. Send for the booklet.

Reliance Speedometer Co.
134 Eliot St. Boston, Mass.



We Ship on Approval

Prepay Freight, and allow
30 Days Free Trial

IT ONLY COSTS ONE CENT to learn our unheard of prices and marvelous guarantee on "Brictson" Detachable Treads.

Let us show you how to save from 300% to 400% on your tire expenses. Write to-day for full particulars.

The Brictson Mfg. Co.
No. 24122 Main St.
BROOKINGS, S. D

A Burroughs Visible Adding Machine $275

The Burroughs Class 300 line of adding machines have visible printing, visible adding and visible writing all in easy reading range and all at the same distance from the eye. The most visible of all visible adding machines, extremely low keyboard, up-to-the-minute typewriter carriage, backed by the Burroughs reputation and Burroughs Service, mechanically perfect, 9 column capacity, price $275—it is a machine you'll want to see. May we show it to you?

Burroughs Adding Machine Co.
271 Burroughs Block Detroit, Michigan



Tones down headlights for city driving and foggy nights—an auto necessity. Price 75c. per pair. Sell like hot cakes. Dealers, secure the agency quick.

F. H. TOBIAS
1931 Broadway, New York

Send Us Your Inquiries When in the Market for

Sheet Metal Stampings

Estimates Cheerfully Furnished

The Bossert Company
UTICA, N. Y.

GASOLINE TURBINES

Half the size, Half the weight, Half the fuel, Half the friction

Smooth as Electric, Will replace any engine in any car

No Valves, No Springs
No Adjustment, No Noise
No Fly Wheel, No Muffler
No Back Pressure

Booklet Upon Request

There Isn't Much Left

SEMPLE S. SCOTT 1661 Marquette Bldg. CHICAGO, ILL.
Exclusive Territory Open for Live Agencies

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Auto Supply Houses:

On this page, the one just before the classified ads, there will be an important announcement each week.

Look for a startler in the next issue.

C. A. SHALER CO.
449 Fourth St., Waupun, Wis.

SHALER Vulcanizers

predominate in auto supply catalogs

In reply to a circular letter sent a few weeks ago to all concerns cataloging automobile supplies, we received two hundred and fifty-four catalogs.

Here's the way the Shaler line led the field of trailers:

	No. of Catalogs Received.	No. of Pages Given.
1. **Shaler**	**254**	**447½**
2. Trailer	254	60
3. Trailer	254	52½
4. Trailer	254	47 5-6
5. Trailer	254	39 1-3
6. Trailer	254	25½
Next ten trailers combined	254	97 1-3

Briefly, distributors themselves acknowledge that the Shaler line is **standard.**

The Shaler line, the only complete line of vulcanizers manufactured in the world, covers the requirements of every motorist and garage.

Get our 1913 proposition at once.

Shaler Vulcanizers—the accepted standard

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For Sale—Wants—Exchange

15 cents per line of six words, cash with order; — In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

MANUFACTURING PLANT FOR SALE THE LARGE FACTORY OF THE CORTLAND WAGON CO., LOCATED AT CORTLAND, N. Y., CAN BE BOUGHT ON EASY TERMS FOR ONE-THIRD ITS ACTUAL VALUE. THE PLANT COMPRISES EIGHT ACRES OF GROUND IN THE CENTRAL PART OF THE CITY, AND LACKAWANNA AND LEHIGH TRACKS RUN ALONGSIDE EVERY BUILDING. THE BUILDINGS ARE OF BRICK AND CONTAIN ABOUT FOUR ACRES OF FLOOR SPACE AND ARE ALL EQUIPPED WITH SPRINKLER SYSTEM, ELECTRIC LIGHT, STEAM HEAT, ETC. THE WHOLE PLANT IS IN FIRST CLASS CONDITION WITH STEAM IN THE BOILERS AND IS READY FOR IMMEDIATE OPERATION. IT IS ESPECIALLY ADAPTED TO THE MANUFACTURE OF AUTOMOBILES AND ACCESSORIES AND AN ABUNDANCE OF SKILLED LABOR CAN BE OBTAINED IN THE VICINITY. IF INTERESTED, PLEASE COMMUNICATE WITH D. W. VAN HOESEN, CORTLAND, N. Y.

FOR SALE—Beautiful small limousine automobile, 23 H.P. assembled car, made upon Renault lines, taxicab size, built to turn readily, in perfect order; a very stylish car; price $1,200; a real bargain; reason for selling, owner not in city this winter; can be seen at Automobile Club by appointment. Address GEO. S. STARBUCK, 34 Pine St., New York City.

VICTORIA TOPS AND SEAT COVERS
That's our specialty, but we make a full line as well. Any style and every one the best that high-grade materials and experienced workmen can make. Prompt service assured. We're glad to estimate special work or quote you prices on stock tops. CENTRAL AUTO TOP CO., Indianapolis, Ind.

$10,000 will purchase 2-story modern garage, machine shop attached, in heart of Atlantic City, operating a government contract netting $3,000 yearly profit, package delivery business, Ford agency 1913, 10 automobiles, also ¼ equity in property assessed at $20,000. Receipts, 1911, over $29,000; 1912, $41,000. CHAS. E. HENKELMAN, Atlantic City, N. J.

FOR SALE—One 1911 Cadillac fore door touring car in elegant condition, equipped with 37 x 4½ tires, windshield, combination oil and electric side and tail lights, speedometer, Ten Eyeck tire pump. Has run approximately 10,000 miles. A Great Bargain. Address "X Y Z," care Motor World.

FOR SALE—Cheap—one 1913 Studebaker "30" touring car, brand new; one 1911 five-passenger Glide, both fully equipped. Address LOCK BOX 75, Vincennes, Ind.

FOR SALE—1910 Peerless limousine; newly done up and relined; price $2,000. 1730 Land Title Bldg., Philadelphia, Pa.

FORD spare demountable wheel, something new. No tire trouble on road. Write. ANGIER'S, Streator, Ill.

1909 Haynes 7-passenger car, magneto, fully equipped, electric light, Newtone horn, etc., $500. Would trade for automobile supplies or small runabout. 1507 Bushwick Ave., Brooklyn, N. Y.

REO 1909 touring, with detachable tonneau, suitable for business or pleasure; $160. CRANE, 434 West 154th St., New York City.

PEERLESS AUTO TOP DRESSING.
A waterproof dressing for leaking mohair and duck tops and curtains. Makes old and faded tops look like new. Ask your garage and supply dealer for it.
The Columbus Varnish Co., Columbus, O.

WANT 1912 E-M-F or similar car in exchange for other property. Might pay cash. Give particulars and lowest price. LOCK BOX 78, Hector, Minn.

FOR EXCHANGE—Two 30 x 3½ Airless tires, never used. Want 30 H.P. engine complete, musical instruments, etc. LOCK BOX 134, Riverhead, L. I., N. Y.

GARAGE, best equipment in State, 46 storage cars, good repair and supply business, best location in Essex County, good agency, long lease, low rent, for sale, $6,000 for stock, machinery, etc. Address P. O. BOX 93, East Orange, N. J.

N. E. AUTO LIST AND TOURIST.
Includes weekly list of all N. E. Auto Owners, Garages, Dealers, etc., with maps and selected N. E. routes, $10.00 yearly. 138 Pearl St., Boston.

1913 Packard. Will dispose of my new 1913 6-cylinder, 7-passenger touring car at a bargain if taken immediately. Address H. M. WALLIS, JR., Racine, Wis.

PEERLESS LEATHER TOP DRESSING
An oil preparation that softens the leather and pantasote. Makes old tops look like new. Ask your garage and supply dealer for it.
The Columbus Varnish Co., Columbus, O.

SCORED CYLINDERS repaired, $12. No enlargement of bore—no need for new pistons and rings. Send piston with cylinder. Absolutely reliable method. References, testimonials, and full details on request. WATERBURY WELDING CO., Waterbury, Conn.

GARAGE to let or for sale. On Broadway, Lawrence, Mass. Main thoroughfare Boston to Rockingham Park. New street, block paved. Two-story building, elevator. Two pits. Tank. Rent, $150 month. Call on or address A. H. CUTTER, 333 Broadway, Lawrence, Mass.

PEERLESS EXTRA FINE BLACK BAKING JAPAN.
Bakes either to a high gloss finish, eggshell gloss or dull finish on lamps, radiators and fenders. Will not crack, chip or peel. Ask your garage and supply dealer.
The Columbus Varnish Co., Columbus, O.

FOR SALE—A block of Capital Stock of Rutherford Rubber Company. Can be purchased quickly for 25% less than from the company. Address FRANZ NEILSON, Attorney, 80 Wall St., New York City.

FOR SALE OR EXCHANGE—Several good used motorcycles. WOLKE CYCLE COMPANY, Louisville, Ky.

TWO expert mechanics will call and give estimate to overhaul or adjust car in you own garage. Address E. BELTZ, 2531 Belmont Ave., Bronx.



An ad. like this will cost you $1.20 for each insertion.

These columns offer you an opportunity to appeal to an audience of 8,000 readers whose merchandising taste is being cultivated

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For Sale—Wants—Exchange

15 cents per line of six words, cash with order. — In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

CHAUFFEUR'S COMPLETE OUTFIT SACRIFICED—Consisting of elegant marmot mink fur lined coat, Persian lamb collar, $35; pair of elegant cub bear robes, $15 each; raccoon cap, $5; pair of fur gloves, $4; pair of goggles, 50c.; 1 pair leather leggins, $3.50. Will sell separately or the lot, all new, never worn, original price, $225. C CHASE, 118 East 28th St., New York.

DO you wish to better your position? If your character and ability will stand investigation we can place you in any occupation, anywhere. Enclose 50c. for registration with references. Fee returned if unsuccessful. Address DEPT. F, BLUE LIST EMPLOYMENT EXCH., 250 West 47th St., New York City.

AUTOMOBILE CYLINDERS reground, new pistons and rings fitted. Garage air compressors. CAST IRON BRAZING CO., Manchester, N. H.

PARTNER WANTED—Successful owner of two California garages finds that the great growth of his business necessitates the securing of responsible assistance. Is willing to sell interest to active, enthusiastic man of ability, this partner to be either a machinist or competent accountant and buyer. Partner's investment not considered as important as his ability. Unusual opportunity. Address BOX 229, care Motor World.

FORD, Buick, Overland, E-M-F, Maxwell, Reo, Chalmers, Mitchell Air-Friction Carberetters, drive your cars three miles per hour on high. Much more speed; much less gas. Our new model B starts easy in zero weather. Equal portions of gasoline and kerosene works perfectly in weather over 60° F. Satisfaction or refund money. AIR-FRICTION CARBURETER CO., Dayton, Ohio.

7-PASSENGER Franklin, 6 cylinders. Cost $4,250. Splendid condition, $1,000. BOND MOTOR CO., 1615 Grand, Kansas City, Mo.

GARAGE space in private garage; touring car $10.00, runabout $8.00. Garage 154th St. and Amsterdam Ave., New York.

FOR SALE—Two worm drive rear axles, designed to carry 5,000 lbs. load—made by Morse-Williams Division of Otis Elevator Co., Philadelphia, Pa. Have never been in service. Make us an offer for them. SHELDON AXLE CO., Wilkes-Barre, Pa.

MAILING LISTS—Automobile owners, dealers, garages, repair shops, commercial car owners, or any make of car. OWNERS AUTO LIST CO., Albany, N. Y.

BROKEN CRANKSHAFTS, cylinders, crankcases, flywheels, gear teeth, pistons, perfectly welded and machined ready to replace. Guaranteed and references. Machinery up to 5 tons welded. ATLAS WELDING WORKS, 74-76-78 Irving St., Rahway, N. J.

DRAGON REPAIR PARTS.
We manufacture and keep on hand all repair parts for the Dragon cars. We make a specialty of repairing this machine. PHILADELPHIA MACHINE WORKS, 67 Laurel St., Philadelphia, Pa.

I AM always in the market for pneumatic tires of all kinds regardless of quantity. If you have a price that is interesting write me. J. G. WHINHAM, Buffalo, N. Y.

PEERLESS EXTRA FINE BLACK JAPAN.
Covers solid one coat for enameling lamps, radiators and fenders. No undercoat required. Heat does not affect it. Ask your garage and supply dealer.
The Columbus Varnish Co., Columbus, O.

ARE YOU in need of any additional help in any department of your business? Are you out of employment or looking for a better connection? Have you second-hand apparatus of any kind or do you want to buy second-hand material. Have you a factory site for sale or do you want to buy one? If so, use the Want and For Sale column of the Motor World. Seven words to the line, fifteen cents a line. Advertisements can be inserted over a number when it is desired and identity of the advertiser will be kept confidential.

PEERLESS BACK AND CUSHION DRESSING.
Softens the leather and will not crack, wash or rub off. Makes old leather look like new. Dries in twenty minutes. Ask your garage or supply dealer.
The Columbus Varnish Co., Columbus, O.

GARAGE WITH MACHINE SHOP and living apartments, all through complete equipped and up to date, for rent or for sale, in fast growing town, on main street, on Long Island, 30 miles from New York. Owner going out of the business. Price reasonable. KAPPERTZ, Farmingdale, L. I. Tel. 21 J.

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Dyes the cloth linings of tops and curtains a black, uniform color, covering up water stains and grease spots. Does not wash off. Ask your garage and supply dealer.
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LOZIER Type H 4-cylinder touring car. Absolutely new. Demountables. Regular guarantee and equipment. Cost, $5,000. Make cash offer. 1012 N. Grand Ave., St. Louis, Mo.

AUTO LISTS, owners, etc., of any State. S. H. CARROLL, JR., Albany, N. Y.

THOMAS 60 H.P. motor with clutch, transmission, Bosch high tension magneto, Stromberg carburetor, for sale cheap. Act quick. Big bargain. KAPPERTZ, Farmingdale, L. I. Tel. 21 J.

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in a car
mounted on
HESS-BRIGHT BALL BEARINGS



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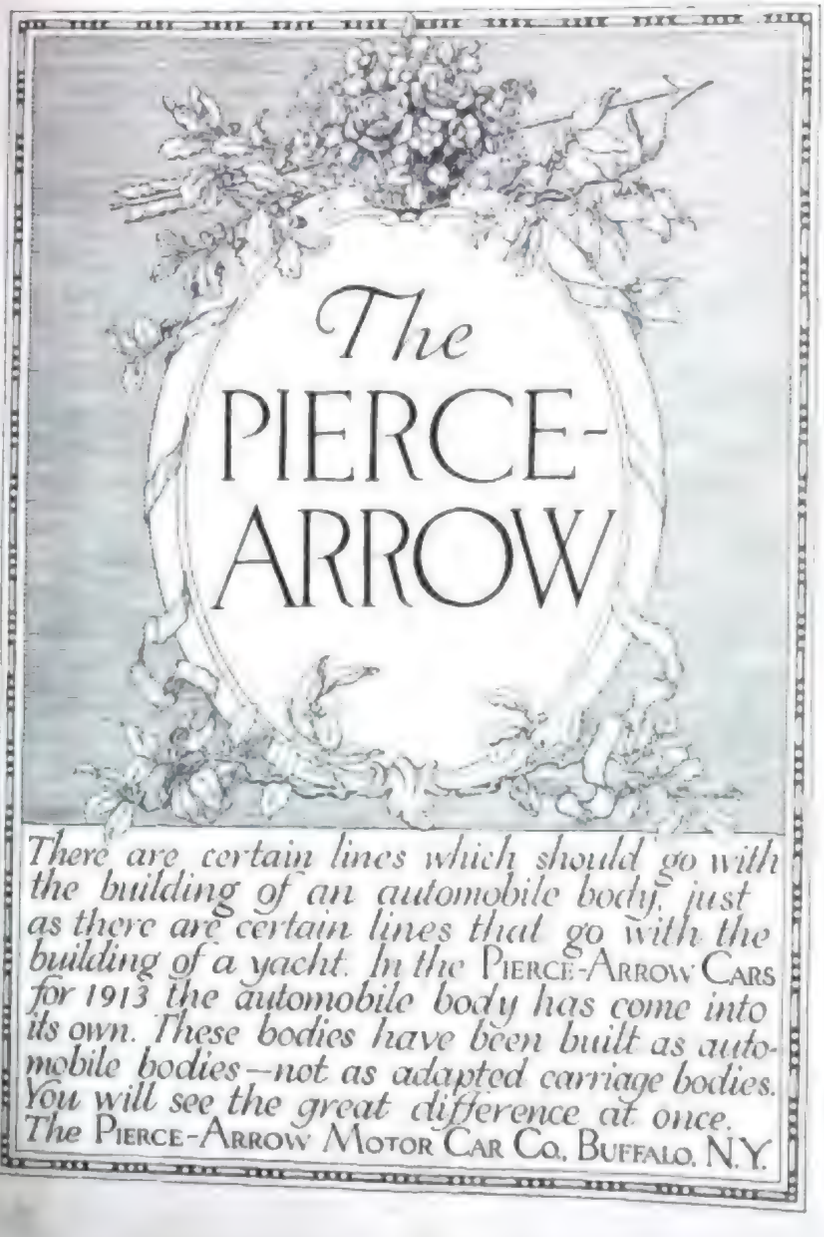
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A Trade Paper Giving the World's Motor News

Vol. XXXIV
No. 1

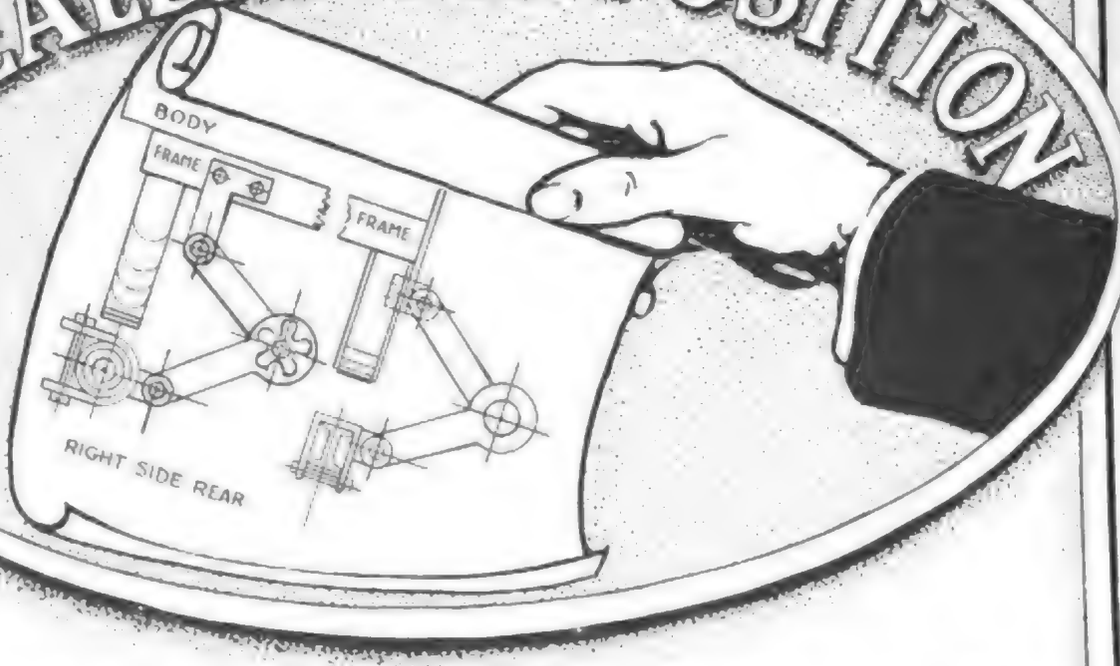
New York, January 2, 1913

Ten cents a copy
Two dollars a year



Published Weekly by the Motor World Publishing Company

A DEALER'S PROPOSITION



Truffault-Hartford
SHOCK ABSORBER

is distinctively a dealer's proposition. We've spent a fortune in compiling blue prints of every make, year, model of automobile manufactured since the motor car industry began. These prints show how to Truffault-Hartford-equip with a minimum of trouble and expense. The printed instructions, also provided, further simplify attachment.

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A dealer's proposition, pure and simple.

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Be Sure Your Cars Are

EQUIPPED

With

R·I·V Ball Bearings



IMPORTED Since 1904 — Quality — R.I.V. CO. 1771 B'way, N. Y.

DEALERS

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DEALERS

Are the Cars You Represent R.I.V. Equipped?

R. I. V. Ball Bearings have correctly grooved raceways, eliminating excessive side-play, machine-cut ball retainers and consequent uniform accuracy of spacing.

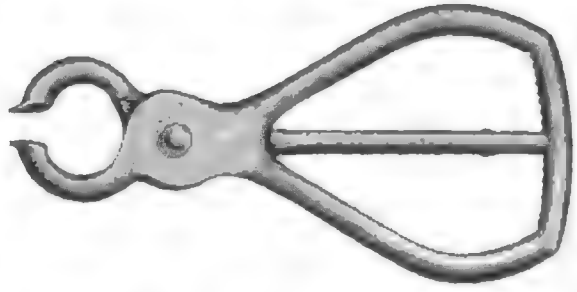
Designed after a most careful investigation into the requirements of motor truck service leading manufacturers, after making exhaustive tests of all anti-friction bearings, are placing them on their latest output.

R. I. V. success rests in the confidence of the public in its product, its methods and its business integrity.

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Booth No. 313, Grand Central Palace

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Mr. Car Manufacturer

You can guarantee your car mechanically but you do not protect the purchaser on tires.

A few cents judiciously expended for Gilmer Tire Repair Pliers as regular equipment will save the buyer of your car hundreds of dollars.

All manufacturers of motor cars realize that the real item of up-keep is tires, for it is an acknowledged fact that the best set of pneumatic tires may be cut or bruised in the first hundred miles of service, and injured rubber leads straight to the inevitable blow out. Hundreds of good tires are discarded daily before they have given 50 per cent. service.

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Let's get together on your 1913 equipment. A complete Gilmer set with every car you manufacture represents but a few cents extra expenditure per car; may I quote you in quantity?

G. WALKER GILMER, Jr.
52 North Seventh Street **Philadelphia, Pa.**

GILMER TIRE-REPAIR PLIERS

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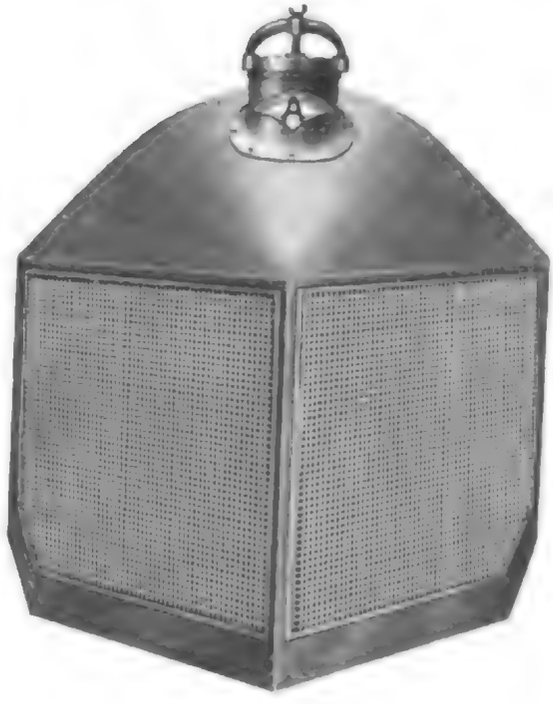
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Fedders Radiators



The square tube radiator is acknowledged to be superior to any other form of construction and Fedders design and methods of manufacture give Fedders radiators a standing second to none in the field.

Fedders Square Tube Radiators offer a maximum of radiating surface—all four sides are surrounded by water—cannot clog and can be repaired in short order by any tinsmith.

While we specialize on square tube types, we are also equipped to build on any specifications that may be furnished. Send us blue prints and our engineering department is at your disposal for co-operative work.

FEDDERS MANUFACTURING WORKS

BUFFALO, N. Y.

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$985 *Completely Equipped*

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Every Overland motor is thoroughly "worn-in" on the block under a belt for 48 hours; it is then tested on the block under its own power for 48 hours.

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When you buy an Overland you are buying guaranteed performance.

In the Model 69T this high priced inspection and supervision costs but $985.

Write today for details. Please address Dept. 50.

The Willys-Overland Company
Toledo, Ohio



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MOTOR WORLD

Vol. XXXIV New York, U. S. A., Thursday, January 2, 1913 No. 2

"GAS" GOES TO 17 CENTS AFTER LULL SINCE JULY

Standard Oil Advances Wholesale Price One Cent—Increase of 88.8 Per Cent. Since Raises Began —Other Changes.

No New Year's greetings accompanied the announcement, but nevertheless the Standard Oil Co. on the day following the birth of 1913 let it be known to the trade that gasolene, that lately restless commodity, had made another ascension, after having been quiet since July, when it reached 16 cents at a cent-a-month rise from a wholesale figure of 9. The price to the garagemen of New York now is 17 cents per gallon, and other prices changed accordingly.

The 17-cent price is that at which the tradesmen will be supplied with fuel and has been attained in the space of about twelve months, it being near this time a year ago that the price began quietly to rise, and had gone several steps above 9 cents before much attention was attracted; the present price represents an increase of 88.8 per cent. over the 9-cent figure.

In addition to the garage price, there are other figures at which the oil company's "auto naphtha" is sold; delivery in wood barrels, which is prohibited in Greater New York and which was 19¼ cents, now is 21, an increase of 1¾ cents. Steel barrel delivery, which in New York takes the place of the prohibited tank wagon delivery, is the form in which garagemen get their "gas." The price to the individual car owner who has facilities for storing gasolene was 18 cents, two cents above the tradesman's quotation, and this now preserves the same margin with an increase to 19 cents.

The increase was not unexpected for fluctuations in gasolene—upward, of course—have been felt in various States as the old year drew to a close, but most prices are close to, if not in accord with, those maintained by the metropolitan division of the company. The same old explanation of the law of supply and demand is made to account for this latest increase, as it has served as the basis for the others.

Pope Secures Massachusetts Charter.

The Pope Mfg. Co., of Hartford, Conn., is now formally a Massachusetts corporation, the necessary charter having been issued late last week. It places the company's authorized capital at $6,500,000, which will be made up of 25,000 preferred and 40,000 common shares. The new corporation will acquire as a going concern all the assets and business of the Connecticut corporation of the same name, the capital stock of which also was $6,500,000. As Motor World stated last week, the transfer is due to the fact that the chief ownership of the Pope company for some time has been vested in residents of Massachusetts.

Otis Elevator Quits Worm Production.

The Otis Elevator Co. of Philadelphia, which, among other things, has been producing a worm gearing of the Hindley type, has transferred that branch of its business to the Hindley Gear Co., also of Philadelphia. It is stated that the demand for the Hindley worm gear axles attained such proportions that it best can be taken care of by a separate company.

Peerless Declares 40 per Cent. Dividend.

Incidental to its recent increase of capital from $3,000,000 to $10,000,000, the Peerless Motor Car Co., of Cleveland, declared a dividend of 40 per cent., amounting to $200,000. This dividend, it is stated, will wind up the business under the $3,000,000 capitalization.

Castle Retires from Lamp Company.

Fred E. Castle has resigned the presidency of the Castle Lamp Co., which recently removed from Amesbury, Mass., to Battle Creek, Mich., and is no longer connected with it in any capacity. He has no definite plans for the immediate future.

STANDARD MOTOR FORMED AS SUCCESSOR TO U. S. MOTOR

Capitalized Under Delaware Laws at $31,000,000 and Officials Already Picked—Many Legal Knots To Be Untied.

When the United States Motor Co. is sold, on Wednesday next, 8th inst., and passes into the hands of the reorganization committee, the name will pass out. In its place will arise the Standard Motor Co., which, in anticipation of the sale, was incorporated on Monday last, under the laws of Delaware, with an authorized capital of $31,000,000. The capital stock of the United States company is $42,500,000. Of the capitalization $11,000,000 is 7 per cent. cumulative first preferred, $9,000,000 is 6 per cent. non-cumulative second preferred and $11,000,000 is common stock.

It is planned that three voting trustees shall have control of the new stock for the next five years—Charles H. Sabin, Harry Bronner and James C. Brady. Halligarten & Co. head a syndicate which has agreed to purchase for $7,720,000 the voting trust certificates representing the stock allotted to shareholders who have assented to the reorganization plan.

The new officers of the company will be Walter E. Flanders, president and general manager; W. F. McGuire, vice-president; Carl Tucker, treasurer, and M. L. Anthony, comptroller. The board of directors will be made up chiefly of members of the reorganization committee.

For the second time, the annual meeting of the United States Motor Co. was adjourned last week, owing to lack of a quorum. About 80,000 shares are necessary to constitute a quorum, and it is stated that there were present, in person or by proxy, only about 69,000. Another attempt will be made to hold the meeting on January 15th—a week after the sale of the property is scheduled to occur.

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At last week's abortive gathering, the corporation counsel of Kingston, N. Y., appeared on behalf of stockholders residing in Ulster county and for the second time made an attempt to secure a full report of the company's operations for the fiscal year which ended July 31st last; his efforts again proved unavailing.

Pending the sale and transfer of the property, the lawyers involved are being kept busy untying the legal knots which have developed in several directions.

So far as concerns the bankruptcy petition, filed against the United States Motor Co. November 18 in the Federal court in Trenton, N. J., an effort was made Monday, 30th ult., to secure its dismissal, and while this move was primarily unsuccessful the petition seems unlikely to prove a stumbling block in the path of the reorganizers in the light of the present standing of matters. The petitioners are small creditors, but their action is said to have been taken at the instance of a U. S. Motor man who is opposed to the reorganization plan.

In demurring to the petition—in which demurrer the United States Tire Co. also joined—on Monday the attorneys, who represented the creditors and reorganizers, denied the allegations of fraudulent transfers of assets, preferential payments, and that the appointment of a receiver in the United States District Court in New York constituted an act of bankruptcy; the judge sustained the demurrer on the first two points but declared that the appointment of a receiver should be construed as an act of bankruptcy. He closed the matter for the day by giving the opponents of bankruptcy two weeks within which to answer.

This two weeks will not be up until January 13—five days after the assets of the company will have been sold in New York City; and once this sale is completed the bankruptcy petition becomes practically nil, since, with 96 per cent. of the proceeds of the sale paid over to creditors who have agreed to the reorganization and the remaining 4 per cent. paid in to the court for those creditors who oppose, this latter figure will be all that will be left for adjudication in bankruptcy, and shortly after the sale the old company will be dissolved and a new one formed. Also the appeal in New York City from denial of an order of intervention asked by some the Columbia stockholders will probably not be reached

STEWART-WARNER MERGER COMPLETES ORGANIZATION

LaChance of Chicago Flexible Shaft Made Vice-President—Branches Unite, Generally Under Former Stewart Manager.

With the election of a vice-president and two directors, the list of officers of the new Stewart-Warner Speedometer Corporation was this week made complete; John K. Stewart was chosen president and C. B. Smith secretary and treasurer more than a week ago when the $11,000,000 corporation was formed by the merger of the Warner and Stewart & Clark companies, and the newly chosen men are: Vice-president, L. H. LaChance, an officer of the Chicago Flexible Shaft Co., out of which the Stewart & Clark company grew; directors, H. M. Whitney, a member of the Chicago law firm of Whitney, Payne, Shaw and Strawn and Stewart's personal attorney, and a representative of White, Weld & Co., New York and Chicago bankers, who financed the deal. Nels Gross, former eastern sales manager for Stewart & Clark, and who was stationed in New York, probably will be sales manager of the corporation; W. J. Zucker, former Stewart manager in Chicago, becomes western sales manager; while A. J. Inderrieden, former Warner eastern sales manager, retains the same office in the Stewart-Warner company.

The organization has been further perfected by the appointments of managers of branches; in most cases the Stewart manager is made head of the branch, with the former Warner manager as his assistant, and both businesses are to be combined under one roof but handled separately.

Branch managers will be as follows: New York, F. O. Fleischer, formerly Gross's assistant; Boston, E. G. Biddle; Philadelphia, C. P. Brewster; Buffalo, James G. Barclay; Cleveland, H. A. Ungar; Detroit, E. W. McGookin; Chicago, H. A. Kraus; Minneapolis, including St. Paul territory, Thomas Snelling; Kansas City, Harry Weber. All except Barclay were Stewart men, as was W. R. Johnston, who is now Pacific coast manager and who will appoint sub-managers in cities in the United States west of the Rockies. The Canadian trade

In some of the American cities the management has not yet been decided upon, but business will be placed under one roof in every case; this cutting of rents will mean a saving of about $100,000 a year, and the cessation of litigation over patents is no mean figure.

The new stock of the corporation is quoted at 95 for preferred and 50 for the common, with 100 as par in both cases. Very little, however, will reach the public; the $1,000,000 of preferred taken by the bankers may be all distributed, but the greater portion of the $10,000,000 common —about $7,500,000, it is said—will remain in Stewart hands.

Ohio Town Heralds Mammoth Project.

What, it is declared, will be "one of the largest automobile, motor boat and aeroplane factories in the world" is to be erected in Bridgeport, Ohio, by the Bridgeport Auto Co., which recently was organized in that little town with a nominal capital of $5,000. It has acquired what was formerly the Crystal Glass factory, and also considerable adjacent real estate, and will raze the old building and erect a much larger and more modern plant better equipped to meet its needs. The incorporators of the Bridgeport company are J. Bernard Handlan, William Gail Hamilton and W. G. Knothe, all of whom are lawyers and of whom Handlan is said to hold the rights to several important patents. In addition to the Ohio attorneys, it is stated that several capitalists who are interested in the enterprise now are manufacturing motor trucks "which are being sold all over the world and the rights to which will be transferred to the new Bridgeport company."

Iowans Acquire a Minnesota Truck.

The Nevada Mfg. Co. of Nevada, Ia., which heretofore has been producing vehicle woodwork, has taken over the plant, machinery and patents of the Fourtraction Auto Co. of Mankato, Minn., which manufactures a four-wheel drive truck under patents of E. Rosenburg, who is the principal stockholder in the Mankato concern. It is stated that the business of manufacturing trucks will be considerably enlarged and that much will be made of a traction-plow with which experiments have been made for some time and which is said to have reached a high state of development.

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WEED CHAIN PLANS REACH WORLD-WIDE PROPORTIONS

President Lasher Purchases Weed's Interests—Factory in Canada and Arrangement With Parsons to Extend European Trade.

Harry D. Weed, of Syracuse, N. Y., who founded the tire chain industry in this country and around whose patent rights the now powerful Weed Chain Tire Grip Co., of New York, was built when W. B. Lasher interested himself in the subject, last week relinquished all connection with the company which bears his name. His patent rights and other interests have been acquired by Lasher, who, to all intents and purposes, always has constituted the Weed company. Weed, who held an interest in several patents of his own and also in the American rights to the Parsons patent, which he early recognized as necessary to its complete success, has not been truly active in the company's affairs. He held no office and his duties largely have been of a consulting nature.

The transaction, which is said to have netted Weed a handsome sum, leaves Lasher in full control, and already he is carrying out plans which may be said to be of a world-wide nature. Among other other things, he has acquired the Canadian rights to the chain business of the Oneida Community, which operates a factory in Niagara Falls, Ont., and in which the Weed chains for the Canadian trade have been produced. Lasher, however, now is organizing what probably will be known as the Canadian Chain Co. and will erect a plant of his own also in Niagara Falls, Ont. Pending its completion, Weed chains will continue to be made in the Oneida Community factory.

Lasher also is reaching across the sea and has consummated an arrangement with the Parsons Non-Skid Co., of London, which owns the parent Parsons patent, whereby American-made Weed chains will cut a conspicuous figure in the trade not only of Great Britain but of the Continent. It appears that the Weed people have designed machinery which enables them to produce and retail their chains at about half the cost of the Parsons company chain, which fact naturally has been a potent factor in bringing about the arrangement between the two companies.

Grabowsky Bids Prove Insufficient.

None of the bids offered at the adjourned receiver's sale, on Tuesday last, of the assets of the bankrupt Grabowsky Power Wagon Co. of Detroit were accepted by the referee, who again will offer the property on January 23rd. It is stated that an offer of $55,000 by Wintermitz & Co., of Chicago, for the material and machinery probably will be accepted, and it is expected that at the public sale on the 23rd inst. sufficient will be realized from the sale of the building and its equipment to swell the net receipts to $200,000, which will net the creditors about 50 cents on the dollar.

Flanders's $600,000 Mortgage Recorded.

The second mortgage on the property of the Flanders Motor Co., which was arranged some time since, formally was recorded in Detroit last week. It is in favor of the Central Trust Co. of New York as trustee, and covers an issue of second mortgage 6 per cent. third year gold bonds of a value not exceeding $600,000. It covers all of the Flanders Motor Co.'s property of every sort, including the use of the name Flanders Motor Co. at home and abroad. It also provides that no demand shall be made for payment of interest against any incorporator, past, present or future, or any stockholder, officer, etc. The instrument is attested by Paul Smith, as vice-president of the company. The first mortgage on the property, to the amount of $300,000, is held by the Union Trust Co. of Detroit.

De Tamble Creditors Refuse 10 Per Cent.

James S. Sansberry of Anderson, Ind., who controls $101,000 of the De Tamble Motor Car Co.'s $200,000 bond issue, has offered the creditors a settlement on a 10 per cent. basis, which at a recent meeting before the referee in bankruptcy was refused pending an examination of the bankrupt company. An appraisement shows that the De Tamble assets amount to $145,000 and the liabilities to $233,000, which includes $133,000 in bonded indebtedness. This leaves about $100,000 due to open accounts.

Six More Added to M. A. M. Roll.

Six new members were added to the roll of the Motor and Accessory Manufacturers, Inc., at the meeting of the directors on Thursday last, 26th ult. They are as follows: Dayton Malleable Iron Co., Dayton, O.; Herschell-Spillman Co., North Tonawanda, N. Y.; North East Electric Co., Rochester, N. Y.; Penberthy Injector Co., Detroit, Mich. Portage Rubber Co., Barberton, O.; Tyer Rubber Co., Andover, Mass.

Baker Shares $200,000 with Employes.

The Baker Motor Vehicle Co. of Cleveland, O., manufacturer of Baker electrics, has declared a stock dividend of $200,000. The dividend is unusual in that it will be equally divided among the stockholders and certain of the employes.

TIMKEN FORMS ALLIANCE TO MANUFACTURE WORM GEARS

Detroit Axle Makers and the British Browns Joined in New Company—Result of Painstaking Investigation.

Reports that the Timken-Detroit Axle Co. was making ready to engage in the manufacture of worm-geared axles were confirmed early this week. The company, it transpires, has formed an alliance with David Brown & Sons, of Huddersfield, England, whose worm gears long since acquired a reputation.

The worms, however, will not be handled directly by the Timken-Detroit Axle Co. but by a new corporation styled the Timken-David Brown Co., whose plant will adjoin that of the Axle company in Detroit. The necessary building already is in course of erection and, pending its completion and the manufacture of certain special machinery in England, the gears will be imported. They will be offered in types for both pleasure and commercial vehicles. The first of the gears will be displayed at the New York and Chicago shows in connection with the Timken-Detroit Axle Co.'s exhibit.

The fact that the Timken people have embraced the worm gear is not altogether surprising. It has been not wholly a state secret that for more than two years they have been inclining in that direction and conducting most exhaustive investigation. Indeed, they have had worms of their own making in practical use in this country for all of a twelvemonth, and, as a matter of fact, had become possessed of complete detailed drawings of worm drive axles long before any of those axles had made their appearance in this country.

Most of the Timken investigation has been conducted by or under the direction of H. W. Alden, the company's chief engineer, who himself made several visits to Europe to make necessary observations and acquire necessary knowledge. Also, on two separate occasions, a competent engineer spent six months in Europe investigating and practically testing every type of worm gear obtainable.

The Timken-David Brown worm is of the straight type, in contradistinction to the hour-glass type. In explaining the Timken choice, Chief Engineer Alden says:

"In the straight type the worm itself is cylindrical throughout its entire length and the worm wheel into which it meshes is concave. In the hour-glass type both the worm and the worm wheel are concave.

"A moment's reflection will show that

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with the hour-glass type there is just one position in which the worm and wheel can be located with respect to each other in order to gain any advantage from even a supposed greater area of contact of the hour-glass type over the straight type.

"The same amount of reflection will show that with the straight type it is only necessary to locate the worm correctly with the worm wheel in one direction. In the other direction it can stand anywhere, because the worm is cylindrical and uniform in diameter throughout its entire length.

"It is, therefore, evident that the straight type is much less liable to damage through misalignment. With the hour-glass type, the slightest misplacement in any direction is fatal. With the straight worm, unlimited latitude is possible in one direction.

"It is common practice abroad to make the worm itself of steel and to harden it. This means, of course, that in the process of hardening, the tooth form is bound to become distorted to some extent. The straight worm can be ground on its working surface after hardening and this is done by the best foreign makers. I use the term 'grinding' here in the sense of removing the inaccuracies incidental to even the most careful manufacture, and not in the sense of smoothing an inaccurate surface by polishing.

"The hour-glass type of worm can be polished, but it is absolutely impossible to grind it in the proper sense of that term. Consequently, with the straight type of worm, it is possible to produce a geometrically perfect article. The exact opposite is true with the hour-glass type."

Alden admits that certain English car builders have discarded the worm after trying it, but declares that their action is due entirely to the fact that they thought the making of worms a very simple matter and rushed into it without proper precaution.

David Brown & Sons have built worms for all purposes for 15 years, and in doing so have invented and constructed a number of machines which are radically different from the machinery used by other makers, which was among the several things that appealed to the Timken people.

On the 2,500 London omnibuses, which are being converted to and made silent by worm drive, Brown gears are being utilized, and in this country they are by no means unknown, as it is the gear which has been employed in the Pierce-Arrow heavy truck

FLANDERS AND CHIEF AIDS REACH PARTING OF WAYS

Pelletier and Paul Smith Will Not Follow Him Into Big Corporation—Christmas Tiff That Preceded Resignations.

E. LeRoy Pelletier will not be advertising manager of the $31,000,000 Standard Motor Co., as the United States Motor Co. will be known after its reorganization is effected; nor will Paul Smith be its sales manager—that is, unless what happened during the past week is mere "stage play," or something else occurs to change the face of the situation. As Walter E. Flanders is to become president and general manager of the Standard company, when the reorganization comes to pass, and as the Flanders Motor Co. is to become a part of it, it has been taken for granted that Pelletier and Smith, who heretofore have worked on a mutual admiration basis, would follow him into the bigger organization.

As a matter of fact, however, they last week resigned from the Flanders Motor Co. and for a brief period it looked as though all was off between Flanders and Pelletier and that they no longer would speak as they passed by, despite their many "greatest ever" declarations and their claims that each "made" the other and "made" Paul Smith between times. According to the stories, Flanders and Pelletier engaged in a little tilt while at Christmas dinner, served in the Flanders homestead. Flanders is credited with having dropped a remark which offended Pelletier and led him to believe that he was not to be taken care of in the same old way, and as a result there is said to have been some heated talk in which the word "nitrate" figured on two sides; but several days later, when Flanders expressed regret, the differences were smoothed over, just as they were smoothed over a year or so ago when Flanders, in playful mood, paid a midnight visit to Pelletier's home and, instead of knocking at the front door, drove his big car up the front stoop and so terrified the women folk that one of them went into hysterics from which she did not recover for a week. Pelletier then vowed he never would forgive his "big chief," but he soon forgot his vow and the two renewed their admiration of

changed his mind before getting there and returned to Detroit.

Paul Smith remained in Detroit. He admits his resignation, but declares it was brought about when he discovered that the policies outlined by Flanders were not what he had expected they would be, and that they were such as would place him in a position where he could not remain and maintain his self-respect. Smith since has received offers from other manufacturers, but Pelletier apparently is foot-free and has declared his purpose to visit Panama before returning to work of any sort.

Reports are current also that many of the high-priced men whom Flanders took from the Studebaker establishment when he himself went over to the Flanders Motor Co. are not likely to find "good things" in the reorganized United States Motor Co., as they had expected would be the case and which they hailed as a reward for their disappointments. In fact, several of them already have found it advisable to seek other berths.

The same reports credit W. F. Macguire, who is to be assistant general manager of the reorganized United States Motor Co. and who is serving in that capacity for the receivers, with being an assistant in fact as well as in name, and also with demonstrating that he is possessed of a will of his own. He is not much given to press-agentry, or other fireworks, and in outlining his work has made plain that his department is not to be a refuge for pensioners, personal press agents or "good fellows." It is fairly certain that no Pelletier ever will dominate Macguire or boast of having "made" him.

It is understood that Berry Rockwell, who only three weeks since retired as advertising manager of the United States Motor Co., has been recommended by the receivers for the same post in the reorganized corporation, and A. B. Barkman, Pacific Coast supervisor and a trade veteran, for promotion to the higher office of general sales manager.

Speedwell Rotary Valve Car Ready.

The Speedwell Motor Car Co. of Dayton, O., in which, as Motor World stated last week, several men identified with the Mead Engine Co., of that city, have acquired an interest, has submitted a proposal to its stockholders to increase its capital stock to $600,000. Meanwhile, it has floated a bond issue of $150,000. As Motor

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The Week's Incorporations

Muskegon, Mich.—Western Auto Co., under Michigan laws; authorized capital, $10,000; to deal in motor cars.

London, Ont.—Royal Motor Car Co., under Canadian laws; authorized capital, $500,000; to manufacture motor cars.

Chico, Cal.—Chico Garage Co., under California laws; authorized capital, $10,000; to operate a garage. Corporators—T. H. Morgan and others.

Harrisonburg, Va.—Harrisonburg Garage, under Virginia laws; authorized capital, $25,000; to operate a garage. Corporators—J. N. Garber and others.

Cleveland, O.—R. H. Allen Motor Sales Co., under Ohio laws; authorized capital, $10,000; to deal in motor cars. Corporators—R. H. Allen and others.

Waterville, Me.—Keene & Kimball Co., under Maine laws; authorized capital, $20,000; to operate taxicabs. Corporators—Wm. L. Keene and others.

Cincinnati, Ohio—Cincinnati Auto Country Club, under Ohio laws; authorized capital, $35,000. Corporators—B. G. Moorman, William Johns, J. H. Davis.

Waterloo, Ia.—Repass Automobile Co., under Iowa laws; authorized capital, $25,000; to deal in motor cars. Corporators—O. A. Repass, C. L. Herring.

St. Johnsville, N. Y.—B. & C. Auto Co., under New York laws; authorized capital, $3,000; to deal in motor cars. Corporators—George F. Bierman and others.

Worcester, Mass.—Worcester Automobile Co., under Massachusetts laws; authorized capital, $12,500; to deal in motor cars. Corporators—M. K. Mykel and others.

Anna, Ill.—Anna Motor Car Co., under Illinois laws; authorized capital, $2,500; to deal in motor cars. Corporators—J. J. Corzine, Roy Rinehart, Ernest Lawson.

Mt. Carmel, Ill.—Manley Wilkins Co., under Illinois laws; authorized capital, $15,000; to deal in motor cars. Corporators—A. R. Manley, E. L. Wilkens, J. Lescher.

Quincy, Ill.—Broadway Auto Sales Co., under Illinois laws; authorized capital, $2,500; to deal in motor cars. Corporators—Alex Thompson, J. G. Stuart, J. N. Clough.

Louisville, Ky.—Miller, White & Co., under Kentucky laws; authorized capital, $5,000; to deal in motor cars. Corporators—R. W. Miller, A. W. White, William Atix.

Morristown, N. J.—Morristown Auto Co., under New Jersey laws; authorized capital, $25,000; to deal in motor cars. Corporators—J. J. Lyons, L. Van Gaasbeek, A. Newmark.

Chicago, Ill.—Adix Automobile Co., under Illinois laws; authorized capital, $2,500; to deal in motor cars. Corporators—A. Dirk, Louis F. Jacobson, William M. Tannenbaum.

Elgin, Ill.—Elgin Motor Co., under Illinois laws; authorized capital, $20,000, to deal in motor cars. Corporators—Edward J. O'Beirne, Mildred O'Beirne, John W. Dolby.

Chicago, Ill.—Aldine Auto Livery, under Illinois laws; authorized capital, $2,500; to operate a motor livery. Corporators—C. A. Dickinson, Arden B. Lapham, Jr., W. R. Scates.

Chicago, Ill.—Marmon Chicago Co., under Illinois laws; authorized capital, $20,000, to deal in motor cars. Corporators—Martin E. Horn, C. E. Erbstein, E. J. Ehlers.

Cincinnati, Ohio—Ideal Lamp Co., under Ohio laws; authorized capital, $5,000; to manufacture motor car devices. Corporators—V. E. Shields, Henry Faultless, Wm. C. Klein.

Juneau, Wis.—Juno Motor Truck Co., under Illinois laws; authorized capital, $10,000; to manufacture motor trucks. Corporators—L. C. Pautsch, H. A. Henning, and others.

Bristol, Va.—Electric Transmission Co., under Virginia laws; authorized capital, $300,000; to manufacture motor car parts. Corporators—Guy Darst, Fred Dulaney, S. E. Puckette.

South Bend, Ind.—Cadillac Motor Sales Co., under Indiana laws; authorized capital, $10,000; to deal in motor cars. Corporators—N. L. Otis, Gus H. Grieger, Edward W. Steinhart.

Moline, Ill.—Plow City Garage, under Illinois laws; authorized capital, $5,000; to operate a garage and deal in motor cars. Corporators—J. H. Johnston, Fred R. Young, O. E. Anderson.

San Antonio, Tex.—Motor Car Supply Co., under Texas laws; authorized capital, $5,000; to deal in motor car supplies. Corporators—C. P. Guthrie, H. B. Lyne, James Harrison, Wm. Harrison.

Williamson, N. Y.—Williamson Garage Co., under New York laws; authorized capital, $20,000; to operate a garage. Corporators—Robert S. Carr, Charles I. Dezutter, Alfred S. Raymor.

Chicago, Ill.—Inland Electric Co., under Illinois laws; authorized capital, $50,000; to manufacture electrical and automobile devices. Corporators—John D. Clancy, G. B. Cohen, J. E. Anderson.

Catskill, N. Y.—Peerless Garage Co., under New York laws; authorized capital, $8,000; to operate a garage. Corporators—Jos. A. Hill, Charles R. Vermilyea, Sarah W. Hill, Alice G. Vermilyea.

Wheeling, W. Va.—Bridgeport Auto Co., under West Virginia laws; authorized capital, $5,000; to deal in motor cars. Corporators—J. Bernard Handlan, W. G. Hamilton, G. T. Knote and others.

Trenton, N. J.—Lord Baltimore Motor Car Co., under New Jersey laws; authorized capital, $100,000; to manufacture and deal in motor cars. Corporators—J. Lentz, Jr., H. C. Nichols, J. L. Conrad.

Columbus, Ohio—Johnston Sales Co., under Ohio laws; authorized capital, $10,000; to deal in motor cars. Corporators—W. J. Bennett, J. C. Felton, A. D. Yeiser, H. M. Johnston, J. H. Bennett.

Buffalo, N. Y.—Regal Distributers, Inc., under New York laws; authorized capital, $15,000; to deal in motor cars. Corporators—Charles A. Hamilton, C. Gardiner Bullis, S. Fay Carr, all of Buffalo.

East Palestine, O.—Automobile Owners' Tire Co., under Ohio laws; authorized capital, $5,000; to deal in motor car tires. Corporators—C. J. Davis, D. H. Mackintosch, Thomas Price, M. T. Davis.

Morgantown, W. Va.—Chaplin-Dille Motor Car Co., under West Virginia laws; authorized capital, $25,000; to deal in motor cars. Corporators—B. M. Chaplin, Minnie Chaplin, M. C. Wildman and others.

Boston, Mass.—Lozier Motor Co. of New England, under Massachusetts laws; authorized capital, $1,000; to deal in motor cars. Corporators—Ralph B. Nettleton, Stanley G. Barker, Robert S. Barlow.

New York, N. Y.—Splitdorf Electrical Co. of New York, under New Jersey laws; authorized capital, $25,000; to deal in motor car devices. Corporators—Carlos W. Curtis, Oscar J. Rhode, Walter J. Murray.

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Portland, Me. — Portland Automobile Dealers' Association, under Maine laws; authorized capital, $10,000; to conduct a benefit association. Corporators—Fred A. Nickerson, Luther C. Gilson, Ernest E. Brewer.

Baltimore, Md.—Maryland Motor Car Insurance Co., under Delaware laws; authorized capital, $300,000; to insure motor cars. Corporators—James C. Fenhagen, William Whitridge, W. Graham Bowdoin, Jr., John P. Bonsal.

Cleveland, Ohio — Marvel Automobile Supply Co., under Ohio laws; authorized capital, $5,000; to deal in motor car supplies. Corporators—J. B. Rosenstein, H. L. Armington, Max L. Rosenstein, Samuel I. Rose, E. L. Fouts.

Youngstown, Ohio — Youngstown Automobile Show Co., under Ohio laws; authorized capital, $1,000; to conduct motor exhibits. Corporators—Warren P. Williamson, I. Van Baalen, J. A. Henderson, John W. Kuhns, C. T. Gaither.

Cleveland, Ohio—Sixth City Machine Co., under Ohio laws; authorized capital, $10,000; to operate a repair shop and garage. Corporators—Ray C. Skeel, Charles M. Ringle, Charles F. Bruggemeiss, Elsie E. Becker, Arthur F. Goldenbogen.

Indianapolis, Ind.—Gray Engine Starter Co., under Indiana laws; authorized capital, $300,000; to manufacture motor starters. Corporators — Thomas J. Gray, Dr. Robert C. Light, Henry M. Spaan, William Bosson, Henry Rosenberg, Mason B. Light, Robert W. Bosson.

Yonkers, N. Y. — Colonial Taxi-Service Co., under New York laws; authorized capital, $3,000; to operate a taxicab service. Corporators—Alfred L. Barmore, Nyack, N. Y.; Ernest L. Miller, 11 Lexington avenue, White Plains; John L. Barmore, 69 Warburton avenue, Yonkers.

New York, N. Y.—Buyers'-Sellers' Automobile Co., under New York laws; authorized capital, $5,000; to deal in motor cars. Corporators—Isaac Cohn, 790 Riverside Hotel; Jay H. Preston, Markwell Hotel; Max Gross, 1523 Washington avenue; Samuel A. Fried, 1386 Prospect avenue.

Changes of Capitalization.

Dayton, Ohio—Automatic Lamp Control Co. from $15,000 to $30,000.

South Bend, Ind.—Milton G. Smith Garage and Auto Co. to $25,000.

WISHART TELLS CREDITORS WHAT HE DID WITH $9,000

Trips and Hotel Bill Made Big Holes in Finances—Proceedings in Bankruptcy Cause Many Court Motions and Orders.

When the creditors of the Wishart-Dayton Auto Truck Co., the New York representative of the Dayton Auto Truck Co., filed a petition in bankruptcy in the Federal court in New York City several months ago they asserted that George Wishart, whose name the company bears, had mismanaged the concern and had taken from the treasury more money than he was entitled to, but not until recently did they secure Wishart's statement of affairs. Now that they have it, they have learned where some of a dealer's profits may go. But more recently, on Monday of this week, they asked to have Wishart adjudged in contempt of court for refusing to pay back $9,551.80 and turn over a truck, but because of a technical error in the moving papers, regardless of whether the move had merit, the application was denied.

They claim Wishart drew funds to the total amount of $18,843.17, and to ascertain what he had done with it brought about an examination wherein Wishart explained certain things. For one thing, he showed that taking a party to the 500-mile race at Indianapolis last May made a hole of $200 in his finances and that living at the Hotel Belmont, which is not a dollar-a-day house, ate up $700 more in a short time. He went to Dayton on business once and came back $100 poorer and when Spencer, his son and a well-known racing driver, made three trips to Dayton, away went $300. A truck, known in the proceedings as the Grey truck, caused him to spend $335 for "detectives and informers," and other items clipped the bankroll at anything from $100 and up per clip.

Despite the fact that Wishart states that he was the whole company, financed it, conducted it and therefore was entitled to do with it about as he pleased, since he often was called upon to meet deficits if any occurred, the creditors are after that $9,000. The court ordered him to pay it back, but in the papers which asked that he be punished for contempt of court, Wishart's attorney has filed a petition in bankruptcy for the Wishart Motor Car Co., which is the new corporation that has been formed to take over the assets of the old company. The new corporation has an authorized capital of $1,000,000. The change of name is due to the expansion and change in the nature of the business. For a considerable period the company produced only rawhide gears, but of late years it has made gears of both metal and rawhide, the output of the former being many times greater than that of the rawhide. It will be further increased when the addition to the plant is completed.

The reorganization carries with it no change in ownership, which is vested chiefly in Thomas W. Meachem and his sons, T. G. and J. F. S. Meachem. The officers of the old corporation, who will fill similar positions in the new one, are as follows: President, T. W. Meachem; vice-president, T. G. Meachem; treasurer, A. C. Vosburgh; secretary, J. F. S. Meachem. These officials and W. H. Diefendorf, chief engineer, constitute the board of directors.

Walter Secures Rights to Latil Drive.

Sole manufacturing rights for the United States in the Latil front drive system have been secured by the Walter Motor Truck Co., of New York, and a 2½-ton truck built under the Latil patents will be one of the Walter exhibits at the approaching national show in New York. The Latil front drive is of French origin and has been in use abroad for several years.

The most prominent feature of the system is that the whole of the mechanism, which includes a four-cylinder motor, four-speed gearset and the usual steering and control mechanism, is mounted on the front axle, together with the driver's seat. Rearwardly projecting frames are provided for the attachment of the body, which may be of any type and may have steel tired wheels —in fact, steel tires are considered preferable because of the reduction in tire expense consequent upon their use. Drive is direct to the front wheels through spur gears.

Lion Assets Finally Bring $13,000.

The assets of the bankrupt Lion Motor Car Co. of Adrian, Mich., finally were disposed of on Tuesday last, 31st ult., to Wintermitz & Co., of Chicago, for $13,000. The previous week the Chicago firm had offered $12,250 for the property, but the referee in bankruptcy refused to accept it and ordered a new sale at which sufficient competition developed to induce the Chicago concern to add $750 to its original bid.

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In the RETAIL WORLD

F. M. Cary is about to establish a garage in Fowler, Cal.

Charles Sherwood has opened a garage in Watertown, Conn.

M. J. Talley is about to have a garage erected in Rockdale, Tex.

French & Heald of Nashua, N. H., just have completed a new garage.

Charles Hammond has established a garage business in Middleport, N. Y.

John Davis is about to open up a garage and machine shop in Miami, Ariz.

C. O. Krohne is about to build a two-story garage in Livingston, Mont.

Frank Parr, of Athens, Ga., is having a garage erected in Lexington, in the same state.

J. J. Terrehen, of Mineola, L. I., has sold the Nassau Garage to Frank and Charles Kenlein.

W. D. Atchinson of Stamford, N. Y., is erecting a garage at the rear of the Atchinson House.

The Schall-Crouch Auto Co., of Baltimore, Md., plans to erect a new garage on North avenue.

Charles Ryder and Martin Karr have taken over the Tracy Auto Garage in Estherville, Ia.

F. L. Haggar has purchased the Hurtig Garage in Minneapolis, Kan. He will continue the business.

H. A. House, of the Hotel Utica Garage, in Utica, N. Y., has become a dealer; he has the Wintoo agency.

A garage which is being erected in Madera, Cal., will, when completed, be occupied by A. R. Shedd.

M. O. Stelter, of Kingfisher, Okla., has sold his garage business to Ray Lichtleiter, of Kiel, in the same State.

Ben S. Moore and Edward Lennon have established a garage in Joliet, Ill. Lennon formerly was a bank teller.

A new garage is to be erected in Wheeling, W. Va., by the A. W. Loe Co. It will be located on Broadway street.

A garage, to cost $100,000, is to be erected in Urbana, O., by the Southern Motors Co. The site is on Third street.

B. F. Renn, of Walla Walla, Wash., is about to build a garage and machine shop in Grandview, in the same State.

S. R. Nelson and W. R. Jones have established an agency in Atlantic, Ia. They will handle the Imperial and Krit lines.

The Maury Motor & Implement Co., of Columbus, Tenn., is about to build a new garage on Garden street, in that city.

Victor Malm has purchased the equipment of the Warren Auto Co., of Argyle, Minn. He will continue the business.

Arthur Wood has had plans prepared for the erection of a garage in Pomona, Cal. It will be located on Monterey street.

John Patterson has purchased an interest in the Wallace Machine & Auto Co., in Canton, Mo. A new garage will be erected.

B. J. Caldwell, formerly of Cucamonga, Cal., has purchased the Ovit Sons Garage in Los Angeles; it is located on 10th street.

The Lemmon Automobile Co and the Apke Auto Co., of Lemmon, S. D., have consolidated; the business is to be enlarged.

William Bobzine has purchased a building in Montour, Ia., formerly utilized as a post office, and will open a garage in the spring.

C. A. Ficke and the Neuman Machine Co. are about to build a garage at 3rd and Ripley streets, Davenport, O. It will cost $10,000.

The California Automobile Co., of Los Angeles, has opened a branch in San Diego, in the same State; O. K. White will have charge.

The Mountain City Motor Co. has been formed in Altoona, Pa., and will erect a garage. H. L. Murray is among the incorporators.

L. O. Everts and D. S. Ewing have had plans prepared for the construction of a garage on I street in Fresno, Cal. It will cost $14,000.

B. J. Bunn, of Charles City, Ia., has sold his interest in the garage firm of Bunn & Riley to T. B. Russell; the new style will be Riley & Russell.

George Eloyer of Mankato, Kan., has sold his garage business to Clarence Riley of Jewell, in the same State; Riley will handle Ford cars.

Tri-City Automobile Co. is the style of a new business which will operate in Davenport, Ia., and Moline, Ill. Great Western cars will be stocked.

Emil Stutz has erected a garage and salesroom in Columbus, O., at 583 South Grant avenue, and is about to become a dealer; he has the Stutz line.

Milton Kent has opened what is the first exclusive automobile salesrooms in Kenosha, Wis. He is located on Park avenue and has the Rambler line.

Lair & Everest have taken over the interests and property of the Gloversville (N.Y.) Garage Co., on Washington street; later a new garage will be built.

E. A. Drake, of Windsor, Ont., has purchased a site in Detroit at Jefferson avenue and Hastings street and will erect a garage; the property cost him $25,000.

The Pueblo (Col.) Auto Repair Shop & Storage Co. has entered business at 521 Court street; Wilmer Flood and M. S. Anderson comprise the company.

John Gigandet is about to open a garage in Piqua, O. Associated with him will be his son, John, Jr., who has conducted a bicycle repair shop for some time.

Frank Woland has leased a garage which is now being erected in Lincoln, Ill., on Sangamon street; when established he will handle Rambler and Oakland cars.

Robert Donovan and his son, Edward, of Charlotte, Mich., have taken over the Losee & Roosa garage; the transaction carries with it the Ford and Rambler agencies.

Warry Gage, one of the oldest liverymen in Logan, O., has sold his business and hereafter will operate a garage; his livery stable will be remodeled for the purpose.

Under the style E & H Motor Co., L. J. Evans and M. P. Hanson have opened a business in Sheboygan, Wis., to handle Regal and Mitchell cars and Chase trucks.

The Pegg Hardware Co., of Metamora, O., has entered the automobile trade; it has purchased the fixtures and stock of the Metamora Auto Co. and will continue that business.

Under the style White Automobile Co. a new business has opened up at 1312 14th street, Washington, D. C. White cars and trucks will be stocked; John Dickson is manager.

S. M. Stone, formerly of Paris, Tex., is about to engage in the automobile business in Chicago, where he has leased salesrooms

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at 1712 Michigan avenue; he will sell Marathon cars.

Charles H. Collins has opened a repair shop in Utica, N. Y., at 185 Mohawk street; he was connected with the repair department of the Westcott Garage Co. for several years.

New Year's Day marked a change in the T. W. Thompson Automobile Co., of Ottumwa, Ia. It has been taken over by the S. P. Mitchell Auto Co., of Oskaloosa, in the same state.

Mervin Yarlot and Merl Neiswender of Bryan, O., have purchased the Sherwood Garage; it formerly was conducted by Frank Clinker, but lately has been owned by Mrs. Rosa Arnholt.

Harry J. Heystek and George V. Brandt have entered the trade in Grand Rapids, Mich., under the style KisselKar Agency; they will handle Kissel cars and trucks and will maintain a service station.

The Martin-Matteson Auto Co., which recently was formed in Galesburg, Ill., has a new garage in process of construction on North Cherry street; Apperson and Paige-Detroit cars will be handled. The company comprises W. P. Martin and S. D. Matteson.

The Studebaker Co. of Minnesota has leased a site in Minneapolis, after long negotiations, at Laurel and Hennepin avenues, and will at once proceed to erect a building for its occupancy; the structure, it is estimated, will cost $75,000 and will be 75 x 154 feet, and of three stories and basement.

Under the style Miller Tire Agency, C. P. Foley and J. F. Riley have opened up at 273 Jefferson avenue, Detroit, Mich., where they will handle Miller tires. Foley, for several years was Michigan representative of the Firestone company and later was manager of the Detroit branch of the Republic company, while Riley was proprietor of the Standard Auto Tire Repair Co.

S. F. Slansky, formerly West Side agent in Cleveland, O., for the Jackson Motor Car Co., and a prominent electrical contractor, has taken over the company's branch and with it the entire Northeastern Ohio territory; sales and showrooms and a completely equipped service station have been opened at 2027 Euclid avenue. E. A. Roemer, formerly traveling representative for the branch before it was taken over, will retain his association with the Jeffery company as special representative in the central Western States.

The Beloit (Wis.) Auto & Machinery Co. has been incorporated to succeed the Fourth Street Garage, located at 842 4th street; the business will be enlarged and will embrace garage work, accessories and supplies and new and used car selling. The officers are: President, J. A. Austin; vice-president and general manager, O. F. Brewer; treasurer, Jerome C. Davis; secretary, R. J. Davis, formerly manager of the Fourth Street Garage; directors, T. M. B. Gunn, and the four officers.

Changes Among Prominent Tradesmen.

G. C. Farnsworth, one-time advertising manager of the Metzger Motor Car Co. of Detroit, has taken up similar duties for the Century Electric Car Co., also of Detroit.

W. L. Caten has been elected vice-president and general manager of the Speedwell Motor Car Co., of Dayton, O. It is stated that his assumption of the duties involves no change of officers.

James Joyce has resigned the office of sales manager of the Selden Motor Vehicle Co. of Rochester, N. Y. Joyce, who is one of the genuine veterans of the industry, has made no plans for the future.

A. S. Watson has been appointed southern district manager of the Olds Motor Works and will make his headquarters in Atlanta, Ga. Previously he was identified with the Olds agency in Cleveland, O.

H. M. Bacon has been appointed manager of the Goodrich-Diamond branch in Cleveland, O. He succeeds C. B. Meyers, who recently became general manager of the Swinehart Tire & Rubber Co. in Akron.

H. H. Doering has been appointed sales manager for the Gramm Motor Truck Co. of Lima, O., which is one of John N. Willys's properties. For several years previous, Doering was sales manager for the Ohio Electric Car Co. of Toledo.

H. M. Denyes has been appointed chief engineer of the Jackson, Church, Wilcox Co. of Saginaw, Mich., maker of the Jacox steering gear and one of the General Motors group. Previously Denyes was identified with the technical department of the Buick Motor Co. in Flint, Mich.

General Motors truck factories, has been appointed chief engineer of the General Motors Truck Co. itself. He succeeds Cornelius T. Myers, who resigned to go into business for himself as consulting engineer.

Minor Business Troubles.

Schedules in bankruptcy have been filed by Elmer E. Rhodes, trading as the Joliet Motor Car Co., in Joliet, Ill. The assets are placed at $5,516.89 and the liabilities at $15,079.20.

Oscar A. Wandschneider, who has traded as Drumm & Snyder, with a garage at 55 East 47th street, Chicago, has filed schedules in bankruptcy; they disclose liabilities of $5,082.60 and assets of $2,413.

A petition in bankruptcy has been filed by the Class Journal Co. and others against William A. Suttle, of Chicago, who has conducted the Automobile Supply Co. at 3900 Sheridan road; the claims amount to $1,862.50.

An involuntary petition in bankruptcy has been filed against the Bates-Odenbrett Automobile Co., of 503-7 Broadway, Milwaukee, Wis., dealer in Krit cars; the petitioning creditors and their claims are: O'Neil Oil & Paint Co., $1,030.42; Geo. W. Browne Co., $138.63; Julius Andrae & Sons, $46.10.

Armin G. Albrecht who, with August J. Diamon, has conducted the White Bear Automobile Co., in Minneapolis, Minn., has brought proceedings for the dissolution of the company; he asks a receiver and accounting. He claims that he bought an interest in the company August 1st last, and that due largely to his efforts the value of the business has increased from $8,000 to $21,300, but that Diamon has neglected the business.

The Equitable Distributing Co., of which Arthur Sidwell is treasurer and which has dealt in automobile supplies at 246 Columbus avenue, Boston, Mass., has filed a voluntary petition in bankruptcy; it states that it has assets of $6,000 and owes $6,677.21, of which $6,543.21 represents an unsecured indebtedness among 100 creditors. The remainder is for wages due and taxes. Of the $6,000 assets $1,000 consists of stock in trade and $2,000 of bills receivable.

Recent Losses by Fire.

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MOTOR WORLD

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NEW YORK, JANUARY 2, 1913

THE LOGICAL WAY TO RATE ENGINES.

It is becoming increasingly evident that the A. L. A. M. engine rating formula, which has outlived the Association of Licensed Automobile Manufacturers itself, no longer serves its purpose. Not a few manufacturers already have expressed themselves to that effect and, indeed, the lengthened and lengthening strokes of engines makes the fact so clear that there is small room for dispute.

Lending point to the situation, it is the declared intention of the New Jersey Commissioner of Motor Vehicles to apply to the legislature for authority to establish each year "special formulæ, as the conditions would demand, for the purpose of arriving at a true horsepower rating," in order to permit of what he considers a proper adjustment of the annual license fees.

If such authority were granted in New Jersey, and adopted by other States, as appears not unlikely, it would lead to chaos. It requires but small consideration, however, to reveal the insufficiency of the A. L. A. M. formula—cylinder bore times the number of cylinders divided by the constant 2.489. An arbitrary piston speed of 1,000 feet per minute is assumed, which obviously is wrong, for it automatically robs the long-stroke motor of the benefit of its cylinder capacity. The advantage of a long-stroke motor consists in the additional power due to running it at a higher piston speed than the short stroke motor. But the A. L. A. M. rule, misfitting the motor to the formula, reduces the crankshaft speed by assuming the same piston speed as in the short stroke motor, eliminating the increase of power that would obtain, due to the increased cylinder capacity, if both motors were run at the same R. P. M. rate.

The insufficiency and elasticity of the A. L. A. M., and all other formulæ for reckoning horsepower, long ago was remarked by Motor World, nor does it seem probable that more than one solution of the problem is possible. It is fairly simple and has been suggested and advocated many times by Motor World. It is simply the adoption of piston displacement as a basis for engine rating.

Several manufacturers of prominence supported Motor World's suggestion, but as many engineers maintained that so many features should be considered that piston displacement of itself would not meet the needs. Motor World, however, has remained unconvinced. It still believes that piston displacement is the true method for rating engines.

As the term "horsepower" has become so thoroughly a part of trade language, its use probably never can be avoided; but it is quite within the bounds of reason to establish an empirical horsepower formula with piston displacement as the basis. In other words, all that is necessary is an agreement that a given number of cubic inches shall constitute the unit of horsepower, and the rest is easy. It may be a radical step and may offend present engineering practice, which, however, is not a valid or logical objection.

The suggestion can be made to serve so many purposes that it well deserves the serious consideration of the Society of Automobile Engineers and other trade organizations. If they elect to permit it to pass unconsidered, the idea is respectfully referred to New Jersey's Commissioner of Motor Vehicles. It will relieve his dilemma for all time.

SALESMANSHIP AT THE SHOWS.

It is an old subject—one that recurs at about this time each year but which has not lost point because of the fact—the subject of intelligent and otherwise competent attendance at the national shows.

Ever since shows first were instituted, the lack of such competence has existed to an extent that has provoked remark. Too many of the men in attendance at too many of the exhibits are painfully lacking in intimate knowledge of the goods they are present to exploit to best advantage.

In corresponding ratio, the need for real and far-reaching intelligence has become greater. Most of those who attend shows are now car-wise. Glittering generalities, however courteously expressed, no longer serve to satisfy them.

"Know thy car," or "thy tire," or "thy accessory," whatever it may be, should be the gospel of every attendant at every exhibit. The manufacturer who is satisfied with less stands in his own light. The old familiar wheeze, "Our engineer will be here at four o'clock and will be glad to tell you all about it"; or the other equally familiar excuse, "Can't you come around a little later when our manager is here?" are confessions of weakness in the sales organization.

Men who sell goods should know all about them, else they are not thoroughly competent to sell them. If there ever was a time when the manufacturer should do his best to demonstrate the efficiency of his sales organization it is at the national shows. There yet remains a week for exhibitors to improve on previous efforts in this respect.

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MORE SPACE REQUIRED FOR CHICAGO SHOW EXPANSION

Wilson Building, Next Door to Coliseum Annex, Leased and Already Partly Filled—Trucks and Cars Added to List.

More elbow room for the Chicago automobile show has been found, and as a result it will fill three buildings, instead of two as heretofore—the Coliseum and Annex, the First Regiment Armory, and the Wilson building, which adjoins the Annex on the south and the lease of which just has been consummated. Like the Annex, it has a main entrance on Wabash avenue, though simply by opening passageways in the south wall of the Annex it can be made to all intents and purposes an integral part of that building.

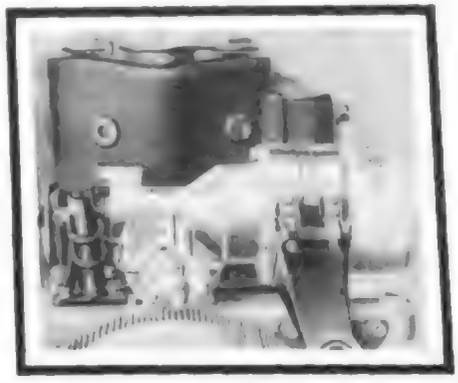
The Wilson building is approximately the same size as the Annex and, as it is free from posts or other obstructions, it readily permits of the display of the largest passenger and commercial vehicles. Already, the Mercer Automobile Co. and the Midland Motor Car Co., previously allotted space in the Annex, have taken space in the Wilson building, as have the Paige-Detroit Motor Car Co., previously allotted space in the Armory, while the W. H. McIntyre Co., the Republic Motor Car Co., and the Century Electric Car Co. have accepted basement spaces thus vacated. The commercial vehicle manufacturers who have accepted space are the Grand Rapids Motor Truck Co., of Grand Rapids, Mich. the Driggs-Seabury Ordnance Corp., of Sharon, Pa.; the Randolph Motor Car Co., of Chicago; the Edwards Motor Car Co., of New York, and the O. Armleder Co., of Cincinnati, O.

Altogether, the acquisition of the additional space will permit the staging of 102 pleasure car exhibits, all of which have been allotted, 77 commercial vehicle exhibits, all but a few of which have been allotted, and 244 accessory exhibits. The work of decorating the Wilson building is being actively pushed, and the few remaining spaces will be offered to the first 30 applicants on the waiting list in the order in which their applications were received.

their last meeting voted to contribute the sum of $150,000 to the temporary committee which has the project in hand, the amount representing one per cent. of the $15,000,000 which it is expected will be the ultimate cost of the highway.

Little Known Features of Well Known Cars

In so far as the operation of the apparatus is concerned, the location of the component parts of the electric lighting and starting system is a matter of small moment, for, since the apparatus requires only occasional attention, and then merely a little cleaning and a drop or two of oil, it is obvious that accessibility is not a prime requirement. In the usual location, however, at the side of the motor, the dynamo or motor, or both combined in a unit, as the case may be, renders inaccessible parts which are more vulnerable and at the same time more vital to the correct functioning of the motor than is the electric system.



MITCHELL STARTER LOCATION

In realization of this fact, the Mitchell-Lewis Motor Co., which produces the Mitchell car, has sought locations for both dynamo and motor which are slightly out of the ordinary. The dynamo is located at one side of the gearset and is driven from the lay shaft. Even more novel is the location of the starting motor, which, as shown in the accompanying illustration, is located under the footboard with the armature shaft at right angles to the crankshaft of the motor. Power to start the motor is transmitted through the intermediary of a worm and worm wheel and a spur gear



January 2-10, New York, N. Y.—Importers' salon in Hotel Astor.

January 4-11, Montreal, Can.—Annual automobile show in the Drill Hall and Armory, under the auspices of the Automobile Club of Canada.

January 6-11, Cleveland, Ohio—Cleveland Automobile Show Co.'s exhibit in the Central Armory.

January 11-18, New York, N. Y.—Automobile Board of Trade's 13th annual show in Madison Square Garden and Grand Central Palace. Pleasure cars only.

January 20-25, Philadelphia, Pa.—Philadelphia Automobile Trade Association's exhibit in the First and Third Regiment Armories.

January 20-25, New York, N. Y.—Automobile Board of Trade's 13th annual show in Madison Square Garden and Grand Central Palace. Commercial vehicles only.

January 21-26, Toledo, Ohio—Annual show in the Exposition building under the auspices of the Toledo Automobile Shows Co.

January 25-February 1, Providence, R. I.—Annual show of the Rhode Island Automobile Dealers' Association in the Providence State Armory.

January 27-February 1, Ottawa, Can.—Annual show of the Ottawa Valley Motor Car Association in Howick Hall.

January 27-February 1, Scranton, Pa.—Third annual show of the Scranton Automobile Dealers' Association in the 13 Regiment Armory.

January 27-February 1, Detroit, Mich.—Detroit Automobile Dealers' Association Show in the State Armory.

February 1-8, Chicago, Ill.—National Association of Automobile Manufacturers' 12th annual show in the Coliseum and Regiment Armory. Pleasure cars only.

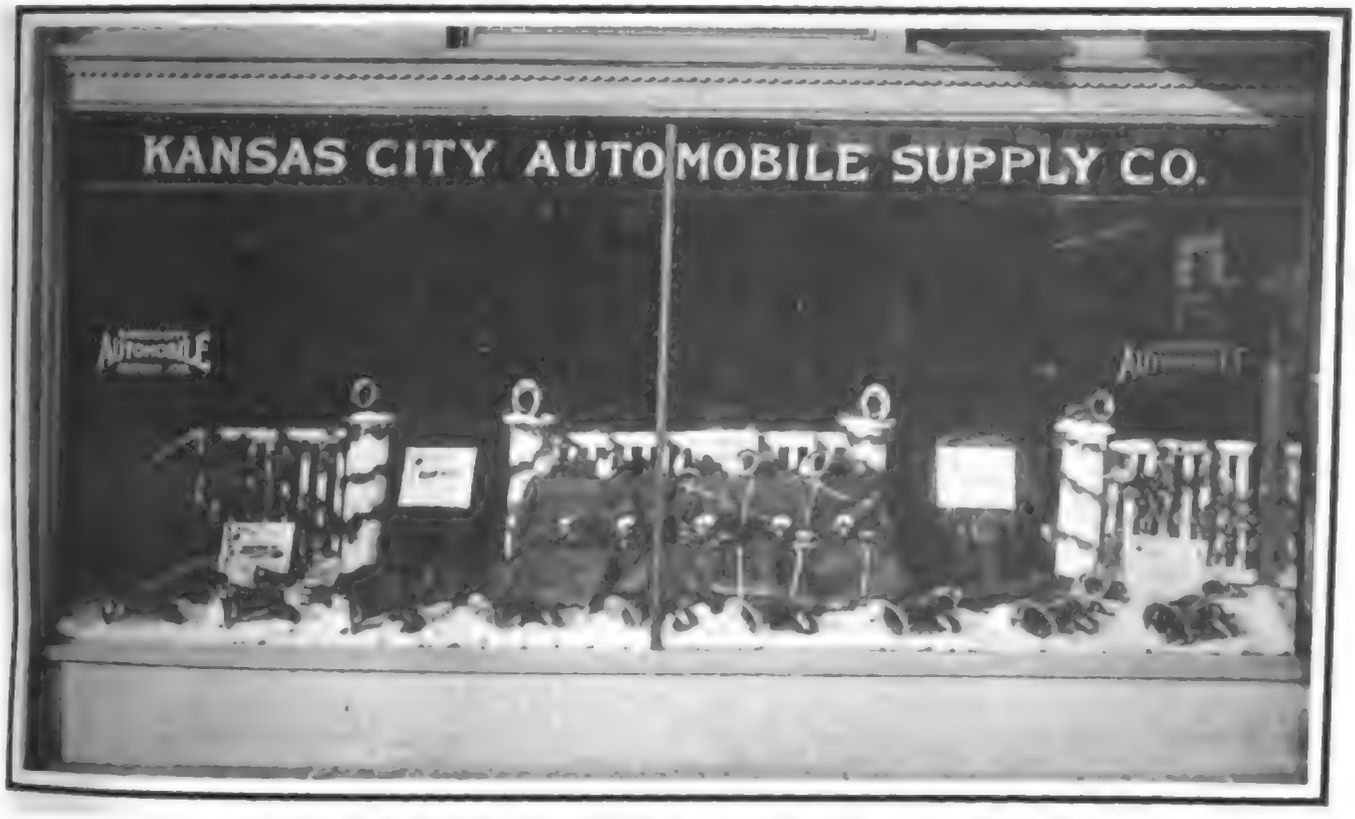
February 3-8, Washington, D. C.—Washington Automobile Show Co.'s exhibit in Convention Hall.

February 8-15, Hartford, Conn.—Annual show of the Hartford Automobile Dealers' Association in the State Armo

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WINDOW DRESSING OF THE CORRECT SORT

Kansas City Accessory House Illustrates Effectiveness of One-article Display, Using Klaxon Horns as the Basis—Attractive Background and "Christmas Touch" Make it Both Eye-pleasing and Seasonable.



"ONE LINE" DISPLAY IDEA EXEMPLIFIED IN A CHRISTMAS WINDOW SETTING

Combining the various commodities of the automobile supply trade in an attractive window display requires no small amount of ingenuity, but that a dealer should despair of having an eye-pleasing window because of lack of superior window-dressing talent is unwise in view of the artistic results achievable when one article of trade is made the basis of design; on the other hand no dealer should falsely imagine that this type of display requires no ability.

What can be done in this line is shown by a window dressed up for the holiday season by the Kansas City Automobile Supply Co., of Kansas City, Mo. In this case Klaxon horns were made the piece de resistance and their effective grouping is depicted in the accompanying photograph. As a base the decorators covered the floor of the window with cotton wool, over which ground mica was strewn to give a snowy touch; at the back of the window a balustrade-like fence separated the window from the rest of the store and at the center of the space, against this fence, boxes were covered with rugs and robes.

The horns were placed at points of advantage but were not crowded; a row extended across the front of the window floor, placed at an angle which eliminated any possible effect of stiffness in the arrangement. Upon the robe-covered boxes were other Klaxons, while four cards in selected locations announced the Christmas season. One mental nudge was given the passerby by the following motto, "A Klaxon Horn the One Best Gift."

While this properly may be termed a one-article window, those who stopped to read had called to their attention the fact that the store sold warm rugs, and the sight of these coverings in the snowy window supplemented the cold outside as a reminder that open-air touring in December is not always as warm as in midsummer.

Truck Club Re-elects its Officers.

In its permanent quarters at 1845 Broadway, where a clerical staff is now employed to handle its work, the Motor Truck Club, of New York, held its annual meeting last week, at which time all of the incumbents were re-elected, as follows: D. C. Fenner, president; Emerson Brooks, vice-president; C. E. Stone, treasurer, and E. L. Howland, secretary. A new board of managers also was chosen, consisting of E. W. Curtis, Jr., George H. Duck, Karl L. Frederick, J. W. Perry, A. W. Robinson, W. Oscar Shadbolt, and Arthur J. Slade. The selections were unanimous, no opposition ticket being presented.

It will be the last time that any president or vice-president will succeed himself, as the organization voted that hereafter the terms of those offices be limited to one year. Plans for a novel breakfast, to be held January 21st, during the week of the New York truck show, were reported well in hand.

Motz Locates Branch in St. Louis.

The Motz Tire & Rubber Co. of Akron, O., has established a branch in St. Louis, Mo., at 4436 Olive street. It is in charge of E. G. Seibel, who previously was connected with the B. F. Goodrich Co.'s Pittsburgh branch.

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WIDE-AWAKE MERCHANDISING In the MOTOR TRADE

FAILURES THAT ASSIST SALES

Learning Not to Make Same Error Twice a Pathway to Success—Scrutiny of Lost Sales May Reveal Helpful Reason.

"Say! Do you know that I had almost made up my mind to buy your car last time you were here?" said the prospect, as he lolled back in his office chair. "It's a fact; you came as near getting my order as anyone ever did; but I've been thinking it over since then and have concluded that it is better for me to wait a couple of months. Drop in and see me in about sixty days. . . . No, there's positively nothing doing now; I can't even take more time to talk about it to-day. Good-bye; will see you in a couple of months."

The salesman gave himself a mental kick as he stepped into his demonstrator and drove away. He recalled that on his last visit he had succeeded in warming up the prospect by the heat of his own enthusiasm; he had felt things coming his way; he knew he had reached further home than ever before. He remembered how interested the prospect had been as he detailed certain features of construction that had been improved; he went over the visit step by step and saw how his work, while good as far as it went, lacked just the final touch that meant an order. A little more courage, a little more resolution, a little more perseverance on the spot and—one more car sold.

The salesman learned a lesson that he capitalized right away. Next day a man one block away bought one of his cars because the salesman had studied his failure of the day before and knew why he had failed. Within a week he had made three sales to men he had been trying to close for a long time.

It is a good thing to get a jolt once in a while; it wakes you up and, if you are the right sort of a salesman you won't grumble but will pick out the weak spot and eliminate it. The salesman, or any other man, always should remember this one thing, that one of the surest pathways to the correction of faults or weaknesses is that of learning not to repeat mistakes; the best of men err, but they are the best men because they learn not to make the same error twice.

FOUR REQUIREMENTS OF RETAIL ADVERTISING.

Much retail advertising is like a charge of buckshot fired into a dark bush because something moved there. The thing that moved was the bush—and the wind made it move; no harm was done, but the buckshot and the powder were wasted.

The shrewd advertiser will sight his game. That is, he will find out what papers they take and what is the best method of reaching them, and will be governed by the facts and not by theories or guesses. This is the plan followed by the most careful and successful national advertisers, and if it is important for them, with their large appropriations, it is even more important for the dealer with a small appropriation.

After deciding on the right medium, the method most successful is to use space sufficiently large to command attention and, with this, couple frequency of insertions. In other words, keep at it often enough to avoid being forgotten.

The general principles surrounding the preparation of an advertisement are: First, to make it attract attention by means of white space, size, design or other method; second, to have it interest by means of a display line that sums up the story told in the advertisement; third, to have it convince by reason of the logical and truthful presentation of selling facts. The only thing left after the ad. has attracted, interested and convinced is to tell where the article can be secured, and the signature and address should be sufficiently prominent and plain so there will be no doubt on that score. The advertisement measuring up to these requirements, placed in the right medium and backed by continuous effort is almost certain to be productive.

CONCERNING "STICKTOITIVENESS" AND "LEMONS."

Those who are in the thick of the selling fight are continually being impressed with the value of sticking to it. And sticking to it does not mean to be so persistent that you earn the ill will of a customer while forcing him to do something that he is going to repent so soon as you are gone.

The right sort of sticktoitiveness means being on the job in season and out of season—being there with a smile and a feeling of optimism, sure that you have the right car for the prospect, serenely confident that sooner or later he will realize it.

Some salesmen are too quick in sizing up a situation; they fancy they are picking a "lemon" when, as a matter of fact, it often is an entirely different kind of fruit. And they often overlook the fact that lemon juice is mighty good in its place. It probably took nerve to squeeze the first lemon and swallow the juice. It takes nerve today to pick out a prospect that everyone else has labeled "lemon" and passed up; but someone is going to squeeze that lemon sometime, and why shouldn't it be you?

It takes strength of will, determination, and courage, but when you have the signed order from someone everyone else neglected because he was so hard to convince, there is a pleasure and a satisfaction that cannot be measured in money. A difficult task accomplished is capable of affording more real pleasure than is obtainable by the mere enumeration of earnings—that is, with the man whose heart is in his work.

Don't be afraid of "lemons"; cultivate the strength that will give you power to give them the right squeeze, and the juice will run into your cash drawer.

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AWAKE-N-DISING WORLD

SERVICE THAT REPELS PATRONS

Sale of Lubricant as an Example of How Not to Do Things—Small Lapses Make Large Fault.

"I want some heavy transmission oil—about half a gallon," said the motorist who drove into the garage.

"Drive your car right up here," said the garageman. "Hey, Bill! Come here and get this gentleman some transmission oil."

"Oil right," remarks Bill, and steps briskly to the row of oil pumps, gallon can in hand.

Doubtful Concerning the Oil.

It was 8:30. Mr. Motorist had an engagement to keep in a few minutes; he got busy and pulled out the floor board of his car, so as to have everything in readiness for the oil man. Presently over he came with his oil, unscrewed the transmission cover and dumped in the oil.

"Guess it will take a little more, sir," he ventured.

"Fill it up," ordered the motorist—and then he gasped in horror. "Why, man alive, is that transmission oil? It looks and acts like cylinder oil. Are you sure it's transmission oil?"

"Well, it's lubricating oil; that's all I know about it," admitted the man in charge of the oil.

Manager Verifies the Doubts.

He started to look for the foreman; after a hurried consultation he came back and affirmed that it was transmission oil. Being of a doubting nature, the motorist went to the front office and consulted the manager.

"Why, he's given you cylinder oil," said the boss. "The best thing you can do now is to stir a little light dope in there and mix it well."

That was done. It took five minutes to replace the cover plate on the transmission; it took three minutes for the man to find enough different pieces of paper on which to wipe off his dirty hands; it took four minutes to look for the foreman to find out the price of the grease and oil; about a minute and a half to find out that he did not know the prices; and then three minutes to run to the front office and consult those in charge; another minute to come back and tell that it was 65 cents; about three minutes more to get a dollar changed, to say nothing about the ten minutes spent in putting in the oil and grease. It was 9 o'clock when the customer finally left that garage.

How Trouble Can Be Avoided.

A large portion of the half hour wasted might have been saved if the grease and oil cans had been labeled and the prices marked in plain figures. Anyone could then have sold it in the absence of the "regular" man, and the autograph register and daily inventory check in use in this garage would have kept a perfect check on the sales.

Incidentally, it would not have been a bad idea for this garage to provide a rag tower or a waste box near oil tanks for wiping off greasy hands and oily splashes on the body of the car.

TIMELINESS IN ACCESSORIES.

Dealers in accessories will find it profitable to follow up the motorist with seasonable articles, one thing at a time. A "live wire" accessory house will, for example, mail a postal card to every car owner in the city on the first snowy day calling attention to its cimplete stock of anti-skid chains.

The first freezing day will bring its circular on hood covers and other little comforts for the motorist and his car. Robes, gloves, etc., will be suggested separately and forcibly.

"There is safety in numbers," wrote someone a long time ago; and accessory dealers have believed it as part of the unwritten law. The result is they spend a lot of money for mail matter that brings no return.

They should try concentrating on a few things at a time. Then, instead of being tossed into the waste basket or laid aside for the distant future, their printed matter is far more likely to bring results.

The thought, in brief, is that the minute a dealer begins to try and sell a man everything at one time he succeeds in selling him nothing. This does not decry the value or diminish the importance of catalogs. It is simply to urge accessory dealers to try specializing on certain things at certain seasons. The thing that is timely demands immediate action—and you make immediate sales.

GARAGE ATTENTIONS THAT ARE WORTH WHILE.

People who drive automobiles are likely to get less and less into the habit of helping themselves and more and more into the habit of being waited on. Wait on them. It's a business proposition—and it pays.

One man who drives a car every day and is consequently a regular consumer of supplies goes to a certain garage for all his gasolene and pays three cents a gallon more for it simply because the people at that garage wait on him. He gladly pays the difference in price for the service that unscrews his gasolene tank, lifts his hood, takes a look into his radiator, examines his tires and fills them when needed. He is a good, steady customer for the garage and the garagemen are out nothing for the extra time they spent in waiting on him, because it has not increased labor or overhead cost one penny. On the other hand, the garage is building a permanently satisfied customer who never misses an opportunity to boost for it.

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Solutions of The Used Car Problem

In Competition for Motor World's Cash Premiums of $50, $25, $15 and $10 for the Best Four Articles Dealing With the Subject.

By JOHN W. GREY, Detroit, Mich.

There is and can be only one solution of the used car problem which will work out logically, and that is when that commodity has a fixed or set valuation in the open market. The trouble with conditions to-day is not with the market, but rests entirely with the dealer and the manufacturers. It really reverts to the old story of insufficient knowledge of the subject—the same story that has caused so many of the failures which have occurred in the industry. The motor car business has had a phenomenal growth, a mushroom growth, and on that account and because the sledding has been so easy no real attention has been paid to this particular end. We have, however, arrived at a time when the standardization of prices has become an absolute necessity, and as essential as the consummation of the original sale.

There should be no more speculation about buying a used car than there is about buying a used locomotive, but because the manufacturers and dealers have failed to agree on a set standard of values this market naturally is in a chaotic state. The average dealer is so avaricious and octopus-like in his desire to consummate a sale that, in nine cases out of ten, he will allow a ridiculous figure for a used car rather than lose the sale. He then hopes to break even by selling this same car at an advance of its regular market value to someone who is not acquainted with the tricks of the trade. If the dealers would only realize they are "killing the goose that lays the golden egg" by making ridiculous trades and educating the public up to false values, and to expect more than their car is worth, there would be a more healthful condition existing to-day.

What is really necessary is for the dealers to get together in each community and form a co-operative association, agreeing, among other things, to have a fixed trading price on every make of car. Of course, there are several in existence to-day, but these seem to be more or less of a joke. The main object has been entirely overlooked in the rush of present day business. This does not necessarily mean an absolute price, but a sliding scale, perhaps allowing a margin of from $50 to $150 difference, depending on the condition of the car, this ratio applying to the more expensive cars; in the lower priced field it naturally would be proportionate.

The National Association of Automobile Manufacturers could really handle this subject, and as a working basis could utilize the figures of value as set forth by the insurance companies. Until co-operation and protective working rules are founded, the present atmosphere will not clarify, as the industry as a whole is coming down to a firm foundation based on clean business principles and not upon the flighty methods of personality and good-fellowship as heretofore

By DENNIS H. STOVALL, Philomath, Ore.

The problem of what to do with the used car is easily solved by equipping it with a delivery body for trucking and general carrying purposes. There is a wide field for the used car here, and the fact is becoming more and more apparent, both to manufacturers and operators.

During the past four seasons there have been only minor changes in the main, or mechanical, features of the leading cars; yet the fact that they are old models, and that there is a difference between the body lines of the present year's car and that of last year, or of two years ago, results in the sale or exchange of many of these high grade machines. And it is a fact well known to all who have given motor cars any consideration, that a high grade machine is always high grade. The material and workmanship that went into it can never be taken away, as long as the car remains intact. It is simply a matter of condition.

A good car, put in condition, is still a good car, no matter how many miles it has run or how roughly it has been handled. For such cars, new parts are always available, and an experienced workman can, at comparatively low cost, make them almost as good as when they came from the factory, so far as all practical purposes are concerned.

Such cars, converted into trucks or other delivery vehicles are available to grocers, bakers, laundrymen, confectioners and florists for one-half and even one-third the cost of the original. In many instances these cars can be bought for little more than the price of a delivery horse and rig; and the car will accomplish five times as much as the horse at a cost of upkeep even less than that of a pair of horses. These used cars are especially good for city delivery work, as they are light and speedy as compared with the regulation truck. And in this work they are business-getters. They enable retail merchants to make deliveries promptly and keep all promises in this regard.

Nor is the used car out of place on the farm, when given the task of hauling produce to town. I can speak with experience in this particular, having used a rebuilt car for farm trucking during the past three years. In this work it dispenses with a span of horses; also, it makes possible the delivery of produce, eggs, butter and milk at an early morning hour, when such things are wanted. The distance to town of seven miles is covered by this "used car truck" in 30 to 35 minutes. The fastest team on the place could not make it, under load, in less than one hour and thirty minutes. Instead of four or five hours being needed for the trip to town, it is made in a little over an hour. Thus the used car, in this work, is a time-saver. With the farmer, as with the merchant or professional man, time is money. This for the simple reason that the time formerly wasted in driving to town with a team can now be used in development work.

The same features that appeal to the city retail merchant appeal likewise to the farmer, when it comes to buying a used car for trucking and delivery purposes. These are cheapness in price as compared with the original cost of the car and its rebuilt condition, excellence of service, and economy of upkeep. There is a risk, of course, in buying a used car, provided such a car is bought in a run-down condition, either from an irresponsible individual or a firm dealing in second-hand cars. But such risk is removed when the car is bought of the manufacturers, either direct from the factory or through a branch house. In this case the maker has a reputation at stake, and is keenly anxious to give satisfaction. The used cars sold in this way are rebuilt cars and, being rebuilt by the makers, have all worn parts replaced, gears renewed, bodies repainted and finished, and the motor put in excellent tune. There is practically no risk in buying such a car, and if purchased for delivery purposes, such a machine will pay for itself within a comparatively short time.

GARFORD LAUNCHES A MODERATE-PRICED "SIX"

Designed to Sell for $2,750 with Complete Equipment, It Mounts a Long-stroke Block Motor with Detachable Cylinder Heads—Other Unusual Features also Incorporated—10,000 Cars to be Produced.

In bringing out for the current year a brand new "six" that differs radically from anything else that has gone before it, the Garford Co., of Elyria, O., has not sprung quite such a surprise as it has by placing the car near to the popular-priced class, thus marking a significant change in Garford policy as a result of the acquirement of the Garford property by the John N. Willys interests.

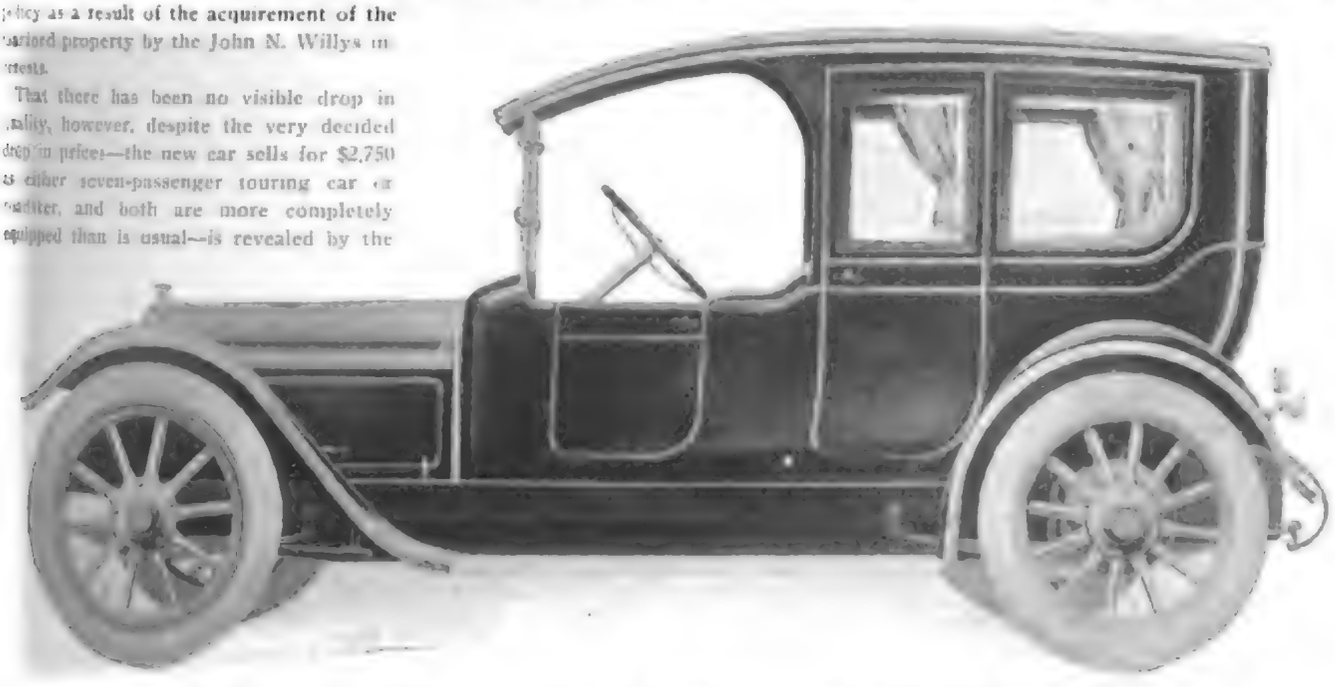
That there has been no visible drop in quality, however, despite the very decided drop in prices—the new car sells for $2,750 as either seven-passenger touring car or roadster, and both are more completely equipped than is usual—is revealed by the list of specifications. Instead, there actually has been effected an increase in quality, as is made plain by the details of construction, the reason for the lowered price being succinctly explained by the production plans which provide for the construction of 10,000 cars during the next twelve-month.

In describing the new Garford "six," reference to its predecessors will serve no useful purpose for the reason that it is a new car all the way through—"from stem to stern," to express it nautically—and differs from all previous Garfords in every respect, with the exception, perhaps, of the hub caps which still display the familiar monogram. Even superficial examination serves to make plain the undeniable difference; it is apparent in the lines of the body and its lowness, in the design and construction of the axles, in the fenders, and particularly in the single large head lamp which blinks from the top of the radiator like an immense eye.

There is much logic, too, in the Cyclopean idea expressed by the use of only one head lamp; it is significant of the policy to eliminate all unnecessary weight. Incidentally, the use of one lamp materially reduces the chance of rattles and, it is pointed out by the manufacturers, if one lamp is good enough for locomotives there is little reason for placing two lamps on a road locomotive, or, in other words, an automobile. The lamp is supported in a spherical socket in the top of the radiator in such a way that it may be adjusted to cast its light rays at the will of the driver, and its position is such that it is particularly safe from damage in the event of collision. The side lamps, which form part of the complete electric lighting and engine starting system with which the car is equipped, are let into the dash and are fitted with parabolic reflectors. The tail lamp and the lamp on the dash are wired in series, thus making of the latter a tell-tale in case the tail lamp becomes extinguished. The electric lighting and engine starting system employed is the U. S. L., which takes the place of the flywheel and is self-contained.

The motor is no less distinctive than the rest of the car and exhibits for the first time the combination of six cylinders in a single block with detachable cylinder heads. The casting is unusually "clean" and clear cut in appearance, and is very nearly rectangular in shape; external parts have been eliminated wherever possible, which fact is true throughout the construction of the whole car. By making the cylinder heads detachable, it is explained, machining operations are simplified and it is possible to obtain a better finish on the bores, to say nothing of the fact that the loose heads tend to make for more even expansion under heat and consequently reduce to the minimum the possibility of dangerous distortion. The motor casting, to which are bolted clutch and the gearset, thus making of the whole a rigid unit, is mounted directly on the main frame at four points, though by reason of the use of what is termed an "equalizer" the effect of three-point suspension in obviating the transmision weaving strains to the motor is obtained.

The bore and stroke of the motor are 3¼ inches and 6 inches, respectively, which, combined with the fact that the reciprocating parts have been made as light as is



NEW GARFORD SIX IN TOWN CAR FORM, WHICH SELLS AT $3,750 FULLY EQUIPPED

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consistent with a liberal factor of safety, accounts for the comparatively high turning effort obtained; as high as 60 horsepower at normal engine speed has been obtained quite easily on block test. Connecting rods are of high grade steel, heat treated, the camshaft is extra heavy with the gear securely bolted to a flange at the end and the crankshaft, which is of the four-bearing type, is distinctive by reason of the unusual method of counterweighting that has been adopted. The counter weights are in the form of arcs, the end attained being that vibration at high speed, or any speed, for that matter, is reduced to the point where it is practically nil. Lending emphasis to the feature of accessibility which everywhere is apparent, the whole unit power plant may be dismounted by removing four bolts and two clevis pins and disconnecting the universal joint to the gearset.

In choosing the material for the valves cognizance has been taken of the necessity for lightness and strength, and to this end they have been made of Tungsten high speed steel and so designed as to reduce the possibility of warpage to the minimum. This possibility is still further reduced for the reason that the valve seats are thoroughly water-jacketed, the cooling water being circulated by means of a larger centrifugal pump; radiation is assisted by a 16-inch aluminum fan located behind the radiator. The advantage of detachable heads again becomes apparent when valves require re-grinding, the operation being simplified by the removal of the top casting when all the valves may be treated at once.

The lubrication system is self-contained and is positive, a gear-driven pump placed near the rear end of the crankcase forcing oil directly to the main bearings, whence it drains into pockets beneath the connecting rods. Scoops on the connecting rods force the oil to the bearings and splash it over the auxiliary bearings and the cylinder walls; one lead from the pump goes directly to the timing gears in the front of the case. A Bosch magneto is used for ignition.

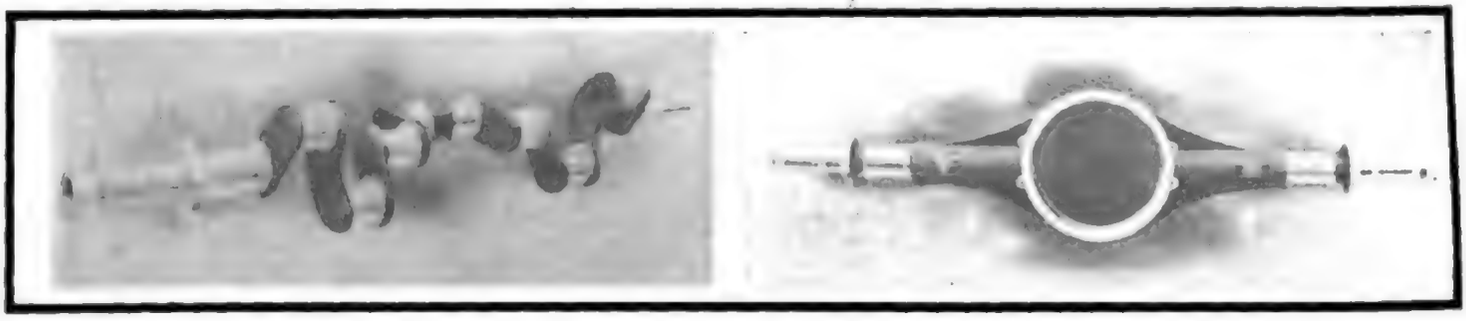
From the carburetter, which is of a new type calculated to render adjustment an infrequent necessity, the gas is fed to the cylinders through a two-way intake pipe, each branch feeding three cylinders. The exhaust manifold is of the "ejector" type.

From the engine, power is transmitted by means of a large diameter cone clutch which is fitted with cork inserts. The gearset is of the four-speed variety in which high speed is fourth, and direct drive third. By making use of an "overstep" for fourth speed it is possible to maintain the gear ratio at the rear axle very low while at the same time providing for quick acceleration with a minimum number of engine revolutions per minute on high gear under normal touring conditions. In conformity with the general trend, the steering gear, which is of the worm and wheel type, is located in the center of the floorboard. The frame is of a new type construction, very thin steel being pressed into a deep channel, the ensemble permitting a degree of rigidity and staunchness that is obtainable in few other ways. By reason of the under-slinging of the rear springs, and the general design, the drive is transmitted in virtually a straight line when the car is loaded.

The rear axle of the car is of the full-floating type and is encased in a housing drop-forged in a single piece; inspection plates are provided, of course. The propeller shaft is contained within a tube bolted securely to the rear axle and serving as a combination torque member and strut rod. The universal joint is completely enclosed in a metal housing and is calculated to run for indefinite periods without attention. The brake drums, mounting internal expanding and external contracting bands, also are one-piece drop-forgings, and the front axle, which has its spring seats forged integral, is set to permit a slight "toeing in" at the bottoms of the wheels. The rear springs are of the three-quarter elliptic variety with the semi-elliptic portion hung beneath the axle, and the front springs are semi-elliptic of the orthodox pattern.

Bodies in each case are formed completely of steel, the various parts which enter into their make-up being welded instead of merely riveted together, which construction, it is pointed out, successfully eliminates the possibility of squeaks or other metallic noises. Bodies are entirely free from wood and joints. The upholstery, of the best hair and hand-buffed leather, is 10 inches in thickness and is mounted over Budde patent De Luxe cushions, which are so constructed that, regardless of the road, there is no likelihood of passengers "striking bottom." Seat cushions are raked backward at an angle calculated to afford the acme of comfort. Cowls are deep and, in addition to carrying the usual equipment, serve also to house a gravity fuel tank (fuel being fed by pressure from a rear tank) and the batteries that go with the U. S. L. system. The speedometer is let into the floorboards so that only its dial is visible and the drive is taken from the transmission, thus eliminating wheel spiders and flexible shafts.

In addition to the touring car and roadster, both of which list at $2,750, a third model, styled a town car and listing at $3,750, also is made, the prices in each case including the following equipment: U. S. L. electric lighting and engine starting system, electric horn and electric heater, the latter being built into place; top with special side curtains which roll up when not in use and may be put in place merely by unfastening their catches, thus permitting them to unroll; rain-vision windshield, built in place; speedometer, tire brackets, inspection and tonneau lamps, ammeter, robe and foot-rails, power tire pump, tire repair kit, and the usual tools, jack, and spare parts.



GARFORD ARC BALANCED CRANKSHAFT AND DROP FORGED REAR AXLE HOUSING



GARFORD "CYCLOPEAN" HEADLIGHT

REILLY'S NO-YEARLY-MODELS IN RESOLUTIONS

At the Sales Manager's New Year's Dinner the Dealer is Deficient in Resolving—Says Reforms, Like Improvements in Automobiles, Should Be Made Without Regard to Season.

Originally it was a pet scheme of the Sales Manager's, but those to whom he broached the subject were quick to express approval, and so it came about that on New Year's Eve, when the majority of the town's population was developing lung power in one way and vinaceous capacity by other methods, the Sales Manager and other factory executives, with some of those dealers who were nearest to the factory, sat down at dinner in the city's best hotel as the company's guests. The idea had grown from its inception, and every man of the group was enthused by the spirit of the gathering which initially had found the germ of its spirit in that of the season.



"I DON'T MAKE RESOLUTIONS ON NEW YEAR'S DAY ANY MORE THAN ON ANY OTHER DAY," EXPLAINED REILLY

Sales Manager Dinner Director.

Being the father of the scheme, the Sales Manager had been voted to the head of the table and had thrilled with pleasure at the cheer and merriment which surrounded the board as the pussy-footed waiters noiselessly cleared away the wreck of one course and caused another to follow in easy succession. As the little army of tray-toters brought coffee and cigars, the Sales Manager arose and, prefacing his talk with the customary seasonal remarks and the usual confession of inability to fill the position, explained the scheme with which everyone, of course, was familiar, having helped develop it; many of the ideas were contributions by the dealers.

Explains the Resolution Scheme.

It was, briefly, that each man at the table, in accordance with the dinner invitations, had sent to the Sales Manager in a sealed envelope New Year's resolutions which he believed the best to be put into effect in connection with himself or his business; it was to be a free-and-above-board meeting, in a way, and as the toastmaster opened the envelopes in succession and read the various resolutions, each man, from the company's president down, was to tell why he had made these resolutions, what had led up to them and what benefit was to be derived.

There was no preference in the opening of envelopes. The first was a dealer; he told of certain things he intended doing in the coming year and spoke briefly. Then followed the company's secretary, another dealer, the advertising manager, more dealers, and the president of the organization had his say. He had resolved to be stricter in his consignment policy and showed whereby this would benefit both dealer and factory; he would make more expeditious the adjudication of defective parts claims, that the public might be as fully satisfied as possible on this score; other things he enumerated and nearly all proved popular. Those with which the dealers did not appear pleased at first could not be objected to when the motive was explained.

The Sales Manager cut another envelope and smiled amusedly as he read to himself the brief resolution upon the sheet; then he read aloud: "I resolve to continue my no-yearly-model policy of resolutions," and added, "and our friend, Reilly, I believe, will tell about his resolution, which is all that appears on this paper."

Reilly's No-Yearly-Model Resolve.

"I am only too glad to add my bit to what has been said," explained the dealer, as he arose. "The explanation, however, is very brief and is just what the resolution says: I don't make resolutions on New Year's Day any more than on any other day. Just

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like series models, I bring 'em out when they're ready."

Reilly sat down, but after a few seconds of mystified silence on the part of the others, who persisted in asking him questions, he forsook his chair once more and began: "I know that when I was invited to this dinner I was expected to contribute to the general program by telling what I was resolved to do during the coming year, but, as I have told you, I have made no resolutions, will not make any in honor of the New Year, so could not truthfully tell you I had done so.

Failure of New Year's Reforms.

"Once upon a time I used to think all during the fall about what I would resolve on New Year's Day, and when the day came I immediately declared in effect the whole list I had thought up; the result was that one by one the good resolves all went to pieces, and generally I was ready to begin all over by St. Patrick's Day. I went through the same program year after year, until I felt foolish about it and decided to give up resolving altogether.

"About that time I heard the first suggestion as to no-yearly-models in the automobile business, and when the next New Year's came around I happened to think that series resolutions were just as sensible as series cars; I then made up my mind that whenever I thought of a resolution worth carrying out I would get it going at once, just as series model manufacturers put improvements into their cars, regardless of any day or season. If the resolution whether personal or business, is worth anything at all it is a loss to yourself or your business to let several months drag by before the resolution becomes an actuality.

Fallacy of Postponed Improvements.

"Supposing, for instance, that you have found your place of business becoming a trifle untidy and that you as well as your employes are at fault in the matter; you must realize that such an appearance is not conducive to increased trade, and there certainly is not a man here who does not want to do a better business. That being the case, what is the use of sitting back and letting that trade-killing condition exist for two months just because you have been brought up to consider January 1 as the day for turning over a new leaf and starting a clean book; it is better not to let the old book get dirty.

"To go to an extreme in our imagination of possible conditions, supposing you had a list of prospects and decided to wait until the first of the year before you went after any of them. You all smile cynically and I know you think such a condition absurd; but to make a comparison, any resolution is supposed to help you, and the going after prospects helps you, so why put off either one until a certain day, unless you have some very excellent reason for so doing?

Sewing Up the Hole in the Pocket.

"I remember well one fall day several years ago I discovered I had been getting lax in meeting bills on time, not because I couldn't, but just because I was careless and didn't keep close enough track of some things. I lost discounts, and every time I got a reminder on a bill and found I had lost a discount it made me sore with myself. I told myself that I would turn over a new leaf on New Year's Day, and just then the nonsensicality of the thing came to me. I said, 'Reilly, you fool! there's a hole in your pocket, the money's dropping out, and you aren't going to have it sewed up until New Year's.' I sewed it up right then, and it was worth the effort, too.

"New Year's resolutions are a whole lot like repairing your house. You find that a window has been broken and you say you'll fix it up New Year's. The house needs it now and you know it ought to be done, but such things should be fixed only on a certain day. Sounds sensible, doesn't it? I don't mean to cast reflections upon anyone or the methods of anyone here, but I submitted the only thing I could in the way of a resolution, and you have asked me to explain it.

"So far as resolving goes, the model system applies quite fully in that introducing improvements once a year and making resolutions once a year are much the same; they are better than no improvements or resolutions at all. New Year's resolving is not such a bad thing in a way, for it really does cause a man to stop and think over himself or his business and very often he will find something which he will effectively correct; but, what is better yet, in my way of thinking, is to have a New Year's examining and resolving every other day and not let yourself or your business backslide.

Will Weakened by Delaying Change.

"Letting yourself do certain wrong things for two months or so under the expectation that you are going to reform on a certain day is will-weakening. You give yourself up to habit, and with every day habit becomes stronger and your will, not being compelled to combat habit, becomes weaker. When the time does come for will to combat habit the battle is many times harder than it would have been had the start been made earlier, and every one of you knows that to be true. Every one of you can remember when, as a kid, you tried to dam a brook and how the water would persist in trickling through. It kept you working every second to keep that dam in shape, I don't need to tell you what would have happened had you sat down upon the bank and decided that you would not begin to stop the trickles until five minutes had passed. It's just the same with resolutions.

"A great many dealers are lax in their dealings with their customers; they allow big margins in trades, give too much or not enough as service or do something which the customer demands but which he would get along just as well without. Instead of making a change on New Year's Day, why not do it at any other time? You may be doing the wrong thing in demonstrating, the factory may be wrong in its consignment policy, but why is January 1 especially fitted for a change?"

Year's Coming Stops Reilly's Talk.

All this time one of the waiters had been hovering nervously about the table, for he had been ordered to bring on a New Year's concoction with which the infant twelvemonth was to be greeted as he was ushered in; but the waiter didn't like to interrupt a speaker, and midnight was getting perilously close. As a last desperate course the waiter stepped to the Sales Manager and whispered in his ear. The Sales Manager glanced at his watch as the waiter departed kitchenward.

Reilly was well wound up by this time and since his harangue had been invited and not thrust upon his audience, he saw no reason for stopping until he automatically ran down; on the other hand, he never realized had long he had talked; he was interested in his theme just as was interested in any other thing he set out to do. As the waiters entered with laden trays the Sales Manager interrupted Reilly. "We must drink a toast to the new year, Reilly, and I'll have to stop you or postpone the new year's coming for a while."

"Easier to stop the new year," laughed a dealer, as Reilly looked at his watch in surprise and sat down, only to rise again as his fellows did likewise. Just then an unusual height of noise from the street heralded the victory of the new year over Reilly, who, despite the fact that he had been made to give way before the youngster, forgivingly raised his glass.

Doane Chosen to Head Lynn Dealers.

Harry M. Doane was elected president of the Lynn (Mass.) Automobile Dealers' Association at its annual meeting last week. The other officers chosen are: First vice-president, Warren H. Beede; second vice-president, Sidney H. Barrett; secretary-treasurer, Percy I. Reynolds. The association has made arrangements to hold an automobile show in the State Armory from January 20th to 25th.

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TIRE SELLING CAMPAIGN THAT HELPED DEALERS

Co-operation by Manufacturer and Retailer That Followed Some Unusual and Effective Channels and That Stimulated Sales of Diamond Product—Non-Skid Tread as Basis and the Methods Employed.



WINDOW DISPLAY THAT FORMED A PART OF THE DIAMOND TIRE SETTING

Co-operation is a word of tremendous significance for both manufacturer and dealer. If the manufacturer fails to assist, "back up" and otherwise help his dealers, or if the dealers fail to assist, help and otherwise "back up" the manufacturer, the result is practically the same—and in figures it is expressed by zero.

Maker and Dealer Pull Together.

It is a great deal easier to pull than to push, and when manufacturer and dealer get into harness by means of a well and carefully thought out plan based upon a true analysis of conditions, and pull together, something of a most satisfactory nature to both parties is quite certain to happen.

At least this is what Clyde S. Thompson, advertising manager of the Diamond Rubber Co., thought, and as a result of thinking it he planned a dealer-manufacturer campaign for Diamond Safety Tread tires that was thoroughly effective from every standpoint and that points a moral to whoever cares to grasp it.

The Diamond idea was to link up forceful newspaper advertising with good window display and helpful follow-up work. In its broad essentials there is nothing new about the plan. It is the general plan of every well directed campaign. The new things were the details and, as in every campaign, the details are the things that count.

The first efforts were centered on New York City, for, it was argued, in this one city there were as many dealers as there are in some States; and, even in New York, conditions vary so greatly that what was accomplished there might very well be taken as a correct basis for future work elsewhere.

Fires First Advertising Gun.

The opening gun of the campaign was fired in the morning newspapers. The story of the Diamond Safety Tread tire and a good illustration of it, in full page space, appeared one Sunday morning. In the meantime a list of the big dealers in New York had been prepared and their home addresses secured. To these dealers an A. D. T. messenger brought a complete copy of the chief paper containing the advertisement, together with a personal letter from the local Diamond manager. The paper showed the dealer exactly what was being done to push the sale of Diamond Safety Tread tires locally—and this plan guaranteed that he saw the advertisement, no matter what paper he might happen to read regularly. The letter explained the entire plan of co-operation and told him where and how to get the Safety Tread tires with which to supply his trade.

Copies of Papers Sent to Dealers.

Dealers in New York territory outside the city were sent copies of the paper and the letter, so that by nightfall on Sunday every one of the dealers interested was fully posted concerning all the details of the undertaking.

For the next step attractive and unusual window displays had been planned; and, by Monday night these were well in hand, because Manager Thompson had not only

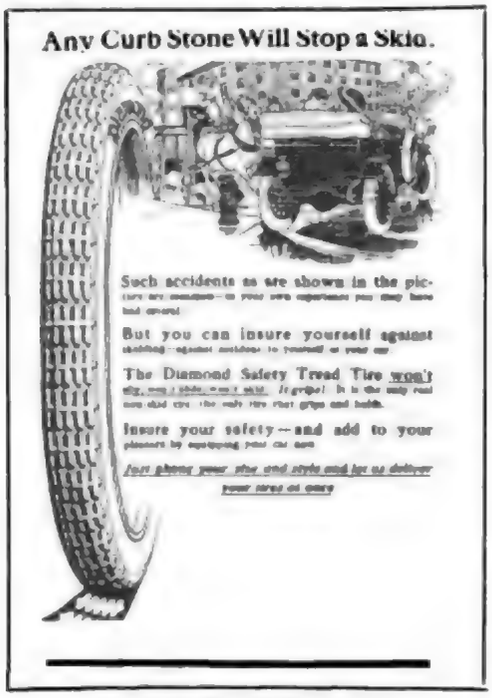
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plenty of ideas but ample material to work with.

Large "cut-outs"—a stiff four-foot lithograph of a man pointing at a Diamond tire—attractive cartons, artistic signs that told a story, all to the point, were supplied to every dealer and definite practical lay-outs of effective, eye-catching window displays furnished.

Attractive Layout of Literature.

A standard design in orange and red, officially adopted as the Diamond colors and used on all literature and printed matter, was used on the Diamond cartons and a clever acrostic scheme by which, on a checkerboard background of orange diamonds, the word "Diamond" was distinctly spelled out, no matter which way the car-



NEWSPAPER ELECTROTYPE

ton sat, formed a tangible and attractive part of the display.

Effective Follow-up by Letters.

All that was done so far was simply a formation for the effective follow-up system, which included further window displays and newspaper advertising over the manufacturer's signature, plus individual follow-up on the part of the dealer. To this dealers' individual follow-up considerable attention had been paid by the Diamond company, for the Diamond people realized that it was the kernel of the whole campaign; and if they could get real co-operation from the dealer at this point it would swing things their way.

The first piece of this follow-up was a typewritten letter printed under the dealer's own letterhead on paper furnished by the Diamond company. The important fact in connection with this special letterhead was that it gave all the prominence to the dealer's name and business—no Diamond advertising or mention of Diamond appeared in any way, except that in a faint, gray tint there was a large reproduction of the Diamond Safety Tread and a street scene that had been used as a standard design in the newspaper advertising. This served to connect this particular piece of literature with what had gone before and what was to come after.

Personal Appeal to the Customer.

The letter opened by stating that "Your size and style in the famous Diamond Safety



DIAMOND WINDOW "CUT-OUT"

Tread tire is included in the shipment we have just received from the factory," and asked if one might be sent to the recipient of the letter; spoke of the newspaper advertising that was attracting attention of customers and bringing them into the store; recommended the tire because customers had spoken so highly of it; and wound up by stating that if the size and style were 'phoned the tires would be delivered immediately.

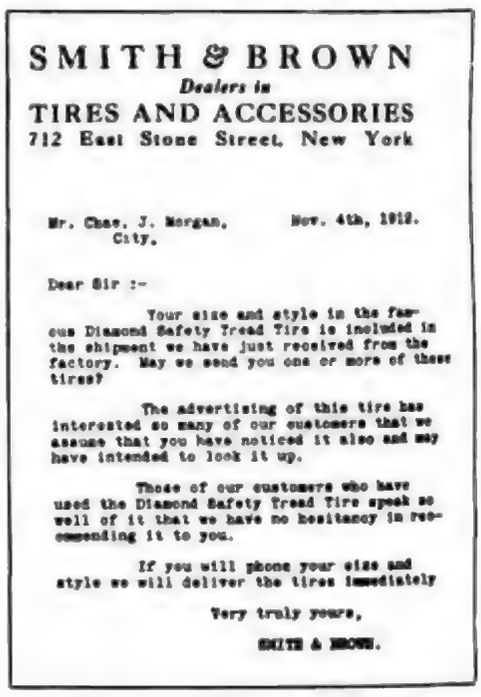
Real Co-operation With the Dealer.

These letters were supplied all addressed and enclosed, ready for stamping and mailing, so that all the dealer had to do was to furnish the Diamond company with a complete list of prospects and customers and then stamp the mail after it reached him. Thus was eliminated any possible chance of the dealer failing to send out the matter after it had been prepared for him.

This letter was followed a week later by a mailing card, the dominating feature of which was a view of a street skidding scene with the heading, "Any Curb Stone Will Stop a Skid," a large Diamond Safety Tread tire appearing on the left in exactly the same style and position as in the previous newspaper advertisements. Ample space was left for the dealer's name and address, and personal advertising. Incidentally, this little detail of leaving large space for the dealer's name and address instead of the usual inch-high space made a big hit with dealers.

Accentuating Newspaper Advertising.

On top of this came a mailing card with a two-color reproduction of the window cut-out. Again the fact that "Any Curb Stone Will Stop a Skid," but "The Diamond Safety Tread will prevent a car from starting to skid," was the keynote. This was followed by an invitation to "come in and let us show



SMITH & BROWN
Dealers in
TIRES AND ACCESSORIES
712 East Stone Street, New York

Mr. Chas. J. Morgan, Nov. 4th, 1912.
City.

Dear Sir :-

Your size and style in the famous Diamond Safety Tread Tire is included in the shipment we have just received from the factory. May we send you one or more of these tires?

The advertising of this tire has interested so many of our customers that we assume that you have noticed it also and may have intended to look it up.

Those of our customers who have used the Diamond Safety Tread Tire speak so well of it that we have no hesitancy in recommending it to you.

If you will phone your size and style we will deliver the tires immediately

Very truly yours,

SMITH & BROWN.

DEALER'S CIRCULAR LETTER

you," and the slogan "It won't slip, won't slide, won't skid—it grips" that had been played up in newspaper advertising was featured. The text was short and to the point.

These three pieces, in connection with what had gone before and was being continued in the newspapers, made an effective campaign that actually linked up the manufacturer advertising with the dealer's store.

Nor was the co-operation allowed to rest there. The "Diamond Dealer," a monthly house organ for dealers in tires and accessories, gave many other suggestions and helps; and each issue carried with it a "Make it Pay" idea on which dealers could "cash in."

House-Organ "Make It Pay" Ideas.

One month it was an offer to furnish moving picture slides with the dealer's name and address; again it was a sheet showing

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a series of prepared newspaper electrotypes which would be furnished for the asking; and another time it was "5 Business Boosters free for the asking," which included an offer to furnish window cut-outs like the one shown, window display cards, circular letters, electrotypes and moving picture slides all at one time. The dealer who did not avail himself of some or all of these helps was asleep at the switch and missing opportunities.

Further issues of the "Diamond Dealer" contained photographs of effective window displays made in various parts of the country and always and everywhere was pushed the idea that the dealer in Diamond tires could have all the help and co-operation he needed if he would only co-operate with the manufacturer.

This sort of manufacturer co-operation is the kind that every dealer can afford to eagerly reach for, because it not only helps him push the sale of the specialty advertised but helps him build up an acquaintance with hundreds of people who otherwise would know nothing about him and actually bring purchasers into his particular place of business.

Of course, this story tells about the plan only so far as it has already been and is being worked out. It has proved so successful that it is but the starting point. Dealers as a whole were quick to avail themselves of the assistance offered, and the entire plan met with a response that was nothing short of marvelous. All of which shows that it is a comparatively easy matter to get dealer co-operation when one does some thinking for the dealer and works out a plan thoroughly with his needs and opportunities in mind. Also it helps the manufacturer to cash in on national advertising by linking up the dominating ideas of the national campaign with the dealer's personal follow-up work.

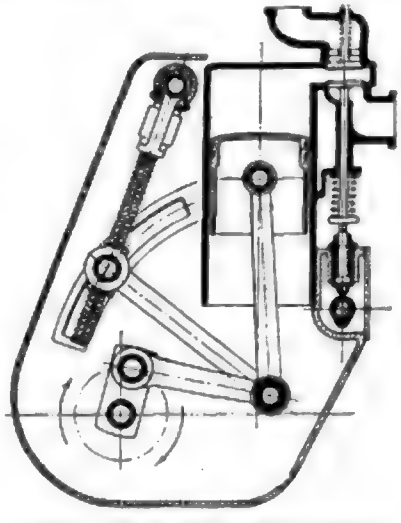
When Motor 'Buses Will Turn Over.

That the motor omnibus is possessed of considerably greater stability than might be supposed by reason of its top-heavy appearance was revealed by a number of tests which recently were made on a new Daimler 'bus designed for use in the streets of Paris. In order to make the tests, the 'bus was placed on a specially constructed platform side end of which was raised with a block and fall until the vehicle virtually balanced on two wheels. With the 'bus empty, it could be tipped to an angle of 41 degrees, measured at the rear axle, before there was imminent danger of its toppling over; loaded on top only, it could be tilted up to 28 degrees, and loaded both inside and outside the angle of inclination could be increased to 35 degrees without causing tipping.

FRENCH SHOW REVEALS BIG DRIFT TO BLOCK CASTINGS

Longer Strokes also in Vogue, but no Startling Changes in Design Apparent—Several New Engines Appear.

As was the case at the previous French automobile show, or Salon de l'Automobile, which annually is held in the Grand Palais in Paris, the exhibition which closed its doors December 22 was more truly international in character than was the London show, despite the fact that the latter was slightly the larger of the two. There were upward of 700 exhibits staged and, needless to add, American cars and accessories were prominent—a great deal more prominent,



ITALA VARIABLE STROKE MOTOR

be it added, than they were at the last French show. England also was well represented, quite as a matter of course, and the Continental exhibits included products from German, French, Belgian, Italian and Swiss factories.

Large Number of American Cars.

The Ford exhibit was the largest single American exhibit and occupied a small section all to itself with a huge electric sign placed over it in such a way that it was instantly visible to visitors passing the portals of the hall. Among the other American cars that held prominent places were the Abbott-Detroit, Anderson electric, Buick, Cadillac, Case, Century electric, Flanders, Hupmobile, Mitchell, Overland, Oakland, R. C. H. and Studebaker. American accessory exhibits included Goodrich tires, Klaxon horns, Bowser gasolene tanks, Vacuum lubricants and Oildag and Gredag, the latter two being deflocculated graphite lubricants, products of the International Acheson Graphite Co.

Block Casting Shows a Gain.

Although there were exhibited no developments in the realm of the poppet valve motor that rightfully deserve the adjective "startling," there was a very well-defined tendency toward block casting and a general increase in the ratio of stroke to bore. With very few exceptions, manufacturers of smaller motors—which size, by the way, would seem to have the call—have embraced block casting whole heartedly, the result being that comparatively few pair-cast cylinders and practically no separately cast cylinders appeared. If there is anything which might deserve the prefix "startling," it is the manner in which the stroke to bore ratio has increased in the past twelvemonth. Several motors which last year exhibited greater conseratism now have strokes that are just double their bores and in at least 50 per cent. of all the motors exhibited the stroke to bore ratio was 1½ to 1. The "square" motor apparently has disappeared, for not one was in evidence. "Sixes," which have proved one of the real developments of the American industry, are not as favorably viewed abroad, according to a census of the show, and have not appreciably increased. The four-cylinder motor still is in the lead, with the "six" second, the "one-lunger" third, strange as it may seem, the twin fourth, and two representatives of the "eight" fifth.

Little Increase in Sleeve Motors.

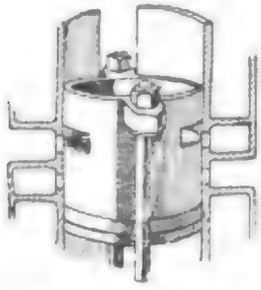
The main tendency, however, is toward block casting, with a decided leaning toward unit construction. The four-speed gearset, which in both England and America has made considerable advance during the past year, has not made such marked progress in French products, though a greater number of cars are equipped with it than was the case at the last show. Knight type motors remain practically stationary, except that in one or two cases—namely, Gregoire and Clement-Bayard—larger models have been added to existing lines. Similarly, there has been little or no increase in the popularity of the other forms of "valveless" motors, the Argyll, the Itala and the Henroid, which first sprang into prominence about this time last year.

As was to be expected, however, several new, or almost new, engines "sans soupapes," as the French quite erroneously say, have been developed during the interim, prominent among which are the Schneider and the M. A. B., the former having a single sliding sleeve valve and the latter having conical rotary valves. In the Schneider engine, the single sliding sleeve

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valve serves alternately as intake and exhaust port, the necessary reciprocating and oscillatory motion being imparted by means of a series of wonderfully constructed eccentrics which permit due periods of "dwell" during the compression and firing strokes. Contrary to the usual practice, the rods which actuate the sleeve—it does not touch the piston, being very short—are attached at the top, after the manner shown by the accompanying illustration.

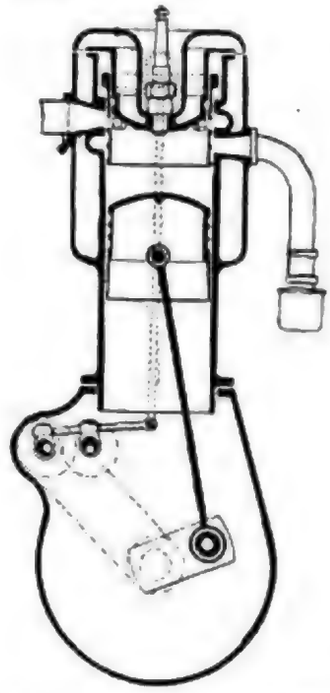
The M. A. B. conical rotary valve engine, a sectional view of the cylinder of which is reproduced herewith, bears slight resemblance to the Russel rotary valve motor,



SCHNEIDER SINGLE SLEEVE VALVE

which made its initial appearance in America about a year ago as the first product of the Silent Valve Co. of America located at Connersville, Ind., though it differs from it in a number of respects. In the M. A. B. engine, the conical rotary valve is driven by a central shaft. One of the peculiarities of construction which is not quite clearly shown by the picture is that in the event of the valve sticking, it is automatically lifted off its seat and out of engagement with the driving gears, thus obviating the possibility of damage. The action, of course, necessitates that the valve be reamed.

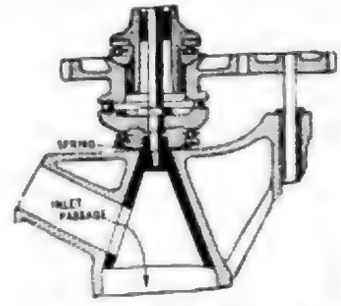
Although it is not a "valveless" engine, the new Itala variable stroke motor is none the less interesting, for the reason that it represents what is claimedd to be the practical application of a theory long since promulgated and quite as assiduously attempted. The sectional sketch is purely diagrammatic and is intended to convey merely the principle upon which the engine works, which, briefly stated, is the same as the



SCHNEIDER SLEEVE VALVE MOTOR

link reversing mechanism of a steam locomotive. The bore of the engine is 130 mm. and the stroke may be varied from 90 mm. to 300 mm. merely by shifting the screw block through the proper distance up and down the quadrant.

As the piston does not perform its short strokes in the center of the cylinder, but alters its relationship with the cylinder head, the compression factor remains constant regardless of the cylinder volume in use. Hence, it is possible to obtain a wide range of powers with approximately the same crankshaft speeds, which fact makes possible the elimination of the usual gearset. When starting, the piston is permitted to perform its full stroke, but as the car speed increases and less power is required, the engine virtually is "linked up," that is to say, its stroke is decreased with the aid of an auxiliary "throttle" lever. The idea is not new, of course, and is as old as the steam engine itself, though in the steam engine the "link motion" is employed to control the admission of steam to the cylinders. The



M. A. B. ROTARY VALVE

Itala engine has been in course of perfection for the past five years and appears for the first time in a practical form.

As was to be expected, the body work at the French show is outre—that is, some of it is—to say the least. Apparently the French leaning toward fantastic lines and "distinctive" designs has not been materially lessened in the past year, though it should be added that the saving grace of an otherwise more or less ludicrous situation is that such fantasy as has been developed can be excused in a great many cases by well-meant endeavors to increase either car efficiency (apparent in the so-called "streamline" bodies) or the comfort of the occupants.

Effect of Heat on Dynamos.

If it were not for the fact that the insulation on coil windings in electric motors, dynamos and other apparatus is rather easily destroyed by heat, it would be possible to make such machines considerably smaller and lighter than they now are built without decreasing the output, allowing them to run at higher working temperatures. This matter of heating is one of the most important factors in electrical machinery designing. The reason a motor or dynamo is given a very high overload capacity for a short time—the figures sometimes reaching as high as 300 per cent.—is that in the time specified the motor cannot become hot enough to do any harm. If the heat did no damage the overload rating might be the normal rating, for the motor or dynamo is quite able to work up to the output

Where and Why Wear Increases.

The reason why noise and, what is more important, wear, increase so rapidly as the clearance between the valve lifter and the end of the valve stem becomes greater, is that the lifter, when raised by the cam, increases its velocity rapidly as it goes up. The further it has to move before striking the valve stem the faster it will be moving and the noisier and more wearing will be the impact.

Noise Caused by Worn Pistons.

A cause of engine noise that sometimes is not suspected is the slapping of worn pistons, which, of course, is likely to occur only when the engine has been run for a long time and the cylinders and pistons are considerably worn. The lateral thrust of the connecting rods rocks the pistons.

Method of Welding Aluminum Wire.

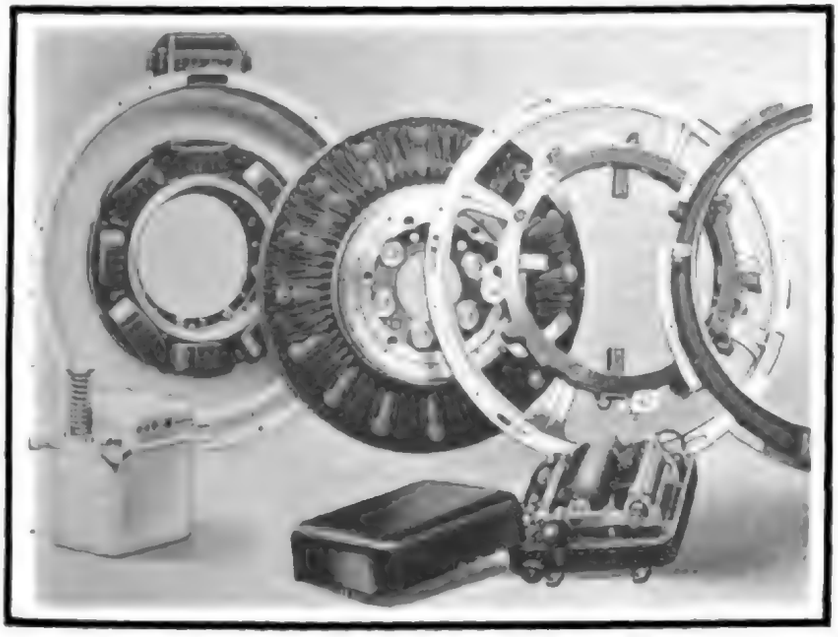
It is said that aluminum wire can be very successfully welded by the following method: The ends of the wires to be joined should be cut off straight and square and held in the flame of a blow-pipe or other source of heat until the aluminum melts; it will be held in place, however, by the film of oxide which forms on the aluminum, which is very difficult to fuse. When the metal has melted in this way, the two ends should be very quickly jammed into each other, when the two molten ends will run together and solidify, forming a strong joint. The secret of doing a good job in this way consists in making the melted metal run together without admitting air between the surfaces and so forming the oxide which is so difficult to avoid in soldering the light metal.

A REASON AND A REMEDY FOR STARTER TROUBLES

Necessity for Properly Charging Batteries and a Simple Adjustment That May Be Made to Compensate for Car Service That Varies—U. S. L. Combined System as an Example of Simplicity and Adjustability.

(This is the fourteenth of a series of articles designed to make clear the electric lighting and engine-starting systems in use and to render easier their care and repair by the dealer and owner alike.)

Taking care of an electric lighting and starting system is a great deal like swimming—it is largely a matter of acquiring confidence. Any normal person can swim if he will but believe he can swim. But first he must try, and after he has gotten over the shock of sinking once or twice—he ought to sink under the guidance of a competent instructor, be it added—and the surprise of discovering that every time he sinks he bobs right up again, he will acquire confidence in his own ability to keep his nose and mouth out of the briny despite an erstwhile leaden heart. Ever afterward he will swim automatically; he will never forget how to do so.



U. S. L. LIGHTING AND STARTING SYSTEM IN DETAIL.

Necessity for Keeping Batteries Charged.

It is much the same with the electric lighting and engine starting system. Any normal person can take care of one of them if he will but believe he can do so and is confident enough in his own ability to make a real attempt at it. And just as the embryo swimmer has certain motions to learn in order to make progress and other things to learn not to do so that he may keep afloat, so has the owner of an electric lighting and starting system a number of things he must learn to do and not to do.

One of the first things the swimmer must learn to do, for instance, is to keep his lungs full of air, for it is the air that keeps him afloat and keeps the water out. Similarly, one of the first things the owner of an electric lighting and engine starting system must learn to do is to keep his battery full of "juice." In other words, he must keep his battery fully charged; he must see to it that the generator is working properly and putting back into the battery just as much current as is drawn out.

Of course, the majority of electric lighting and engine starting systems on the market are quite automatic in action, as already has been made plain in the thirteen preceding articles that have appeared in Motor World, and may be relied upon to maintain the battery in a fully charged condition practically without attention. A certain amount of care is necessary, as a matter of course, though it is not of the kind that requires a college education.

When Adjustments May Be Incorrect.

As the average system comes from the manufacturer, fitted to a car, it is set to operate at what has been predetermined to be a fair average normal car speed. That is to say, it is set to close connection between the generator and the battery at approximately 12 to 15 miles an hour, for instance. Hence, it ought to commence to charge the battery immediately the car speed exceeds the current for which the cut-out is set. And it will always do so, provided, of course, that there is no derangement in the mechanism.

If, however, the cut-out is set to operate at, say, 16 or 18 miles an hour, or 20 miles an hour, and the average speed at which the car is driven is less than the low limit for which the cut-out is set, it scarcely requires elaboration to make plain that trouble is bound to ensue; it will be only a matter of time before the battery is exhausted to the state where it is incapable of starting the motor, at least, and probably incapable of lighting the lamps.

Often, even where the cut-out is set to operate at a fairly low rate of car speed, trouble of the kind may manifest itself through no fault of the mechanism. Suppose, for instance, that the electric lighting and engine starting system is fitted to a large touring car, which, legitimately, may be expected by the manufacturer to be used for touring service. In such case, the cut-out probably would be set to operate at approximately 14 miles an hour, for it is logical to expect that the average touring speed would be at least that high.

The Importance of Proper Setting.

If the car is driven continuously in city traffic, however, where, by reason of congestion and low speed limits, the car speed but seldom can be made to equal or exceed the low limit for which the cut-out is set, it follows that the energy in the battery will be depleted, particularly where a great number of stops requiring the use of the engine starter are made. Another thing. Even when the car is stopped and the engine permitted to run idly, no current will be passed to the battery in the majority of cases, for the engine then will be running too slowly. It is possible, of course, to let the engine "turn up" faster during brief stops, though the practice is not to be recommended under any circumstances, for it is one that will do more harm to the engine in causing unnecessary wear—to say nothing of wasting fuel and oil—than it will do good to the battery.

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Generally speaking, most generators of the kind that are used in electric lighting and engine starting systems can be expected to generate sufficient current to charge the battery (even if at a very low rate) at lower speed than that for which the cut-out is set. Naturally, there are well-defined limits which it is not well to exceed. Consequently, where it is found that the battery appears unduly exhausted after continuous town service, or other service that requires a slow rate of speed for protracted periods, it is possible in a great many cases to apply the necessary specific to effect a cure merely by adjusting the cut-out device. Where the mechanism is of the electro-magnetic type, which is the type most generally used, the operation is quite simple in the majority of cases, and requires only that the tension on the spring which returns the cut-out arm to its normal position be decreased.

Determining When Cut-Outs Should Close.

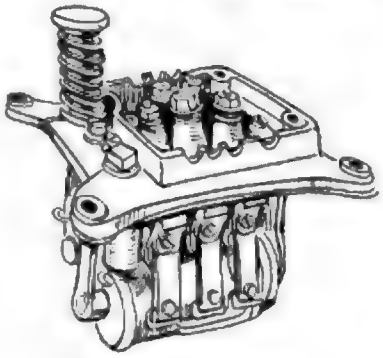
Needless to add, great care must be taken in making the adjustment, for there is danger of doing more harm than good. The best way to go about it is to make frequent observations with the aid of the speedometer during three or four days when the car is driven in average service, and then to compute the actual average speed of the car for the period. Then with that speed as a guide, and with the aid of the speedometer, the cut-out should be set so that its contacts come together when the speed is reached. For instance, suppose that the cut-out closes the circuit normally at, say, 13 miles an hour and that the normal average speed obtained by observation and computation (guesswork will not do) is only 11½ miles an hour. Then, with the car operating at 11½ miles an hour, according to the speedometer, the tension on the cut-out armature return spring should be reduced until the contacts come together. The generator, then, will commence to charge at that rate of speed. The original determination of the speed at which the cut-out operates can be made, of course, by examining the device carefully while the car speed is increased, making note of the speed shown by the speedometer immediately the contacts come together.

Adjustments That Are Easily Made.

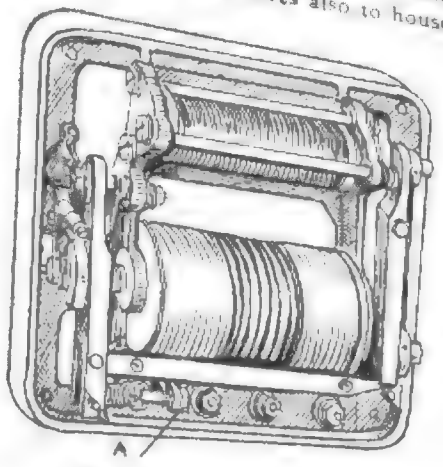
Adjustment of the kind may be made with very nearly all of the electric lighting and engine starting systems on the market by any person possessing average intelligence without fear of untoward results, provided care is taken. Decreasing the tension on the spring too much will cause the contacts to come together too soon, of course, and may result in the battery discharging itself through the generator. In only one or two cases is it impossible to make such an adjustment, and in these cases the apparatus should be referred to either the manufacturer or to the dealer from whom the car was purchased, care being taken to state specifically the actual average rate of speed at which the car is driven and the service for which it is used.

Carbon Pile That Regulates Current.

Generally, cut-out mechanisms are located on the dash in an accessible position where they may easily be gotten at, which practice obtains in the U. S. L. system, which is manufactured by the United States Light & Heating Co. of Niagara Falls, N. Y. The cut-out used in the U. S. L. system is illustrated herewith, and, as may be seen by the picture, the same case serves also to house



U. S. L. STARTING SWITCH



U. S. L. GOVERNING UNIT

the regulating mechanism, which consists essentially of a pile of carbon disks placed in series with the shunt field of the generator. The pressure on the pile of carbon disks is varied automatically by the current passing through the field; the greater the current passing through the field the less will be the pressure upon the carbon pile and consequently its resistance will increase and cause the current to drop, thus maintaining it practically constant. When there is little current passing through the field, the pressure on the disks is greatest, thus permitting the field to "build up" and the current to increase.

The U. S. L. cut-out, as may be seen in the picture, is nothing more or less than a small electro-magnet which actuates an arm carrying a contact. When the current generated by the dynamo exceeds the voltage of the battery, which is floated on the line, the magnetism of the coil is sufficient to draw the arm toward it, thus bringing the contacts together and establishing the connection between the battery and the dynamo. That is to say, the magnetism will draw the arm toward the core of the magnet and thus bring the contacts together, provided it is strong enough to overcome the "pull" of the spring which returns the arm to its normal position with the contacts separated. It is here that the adjustment must be made if any is necessary.

How Spring Tension May Be Altered.

As is shown in the illustration, the tension of the spring may be varied by screwing up or unscrewing the tiny nut (A) at the end of the treaded screw to which the spring is attached. Unscrewing the nut will decrease the tension and cause the contacts to come together at slower car speed; increasing the tension will have the reverse effect. In making the adjustment, the nut should not be moved more than about a quarter of a turn at a time; in fact, one-eighth turn may suffice to make the necessary correction.

Except for the fact that the U. S. L. electric lighting and engine starting system employs an electro-magnetic cut-out and the method of regulating current with a pile of carbon disks, it is different in a great many ways from everything else of its kind on the market. Primarily, it is of the type in which the motor and the generator are combined in a single unit, which serves alternately to charge the battery and to start the engine it differs from all other such systems except two, however, in that it is designed to take the place of the flywheel. Consequently it performs three functions, though, despite this fact, it adds no weight to the car to which it is fitted.

Motor and Dynamo In the Flywheel.

The whole apparatus consists essentially of three elements, not including the switch, the cut-out and regulator, and the battery, and these three are shown by the accompanying illustration disassembled the better to make plain their construction. From left to right, these three elements are: The aluminum case mounting the field coils, the armature and brushes, and the brushes and brush rig, the fourth element, of which only part is shown, being merely an outside dust ring. The switch and the cut-out and regulator also are shown in the picture.

The aluminum casing mounting the field coils is assembled at the factory as a unit and afterward is bolted directly to the crankcase of the engine concentrically with the crankshaft. The field consists of eight poles bolted to a pole ring. The armature, which is of the outside ring type, together with the commutator, also is assembled as a unit, and the whole is bolted to the flange plate on the end of the crankshaft, the armature, therefore, rotating about the field. The third unit, consisting of the brushes and the brush rig, as it is styled, is bolted to the casing and remains stationary. The switch, which also is shown in detail, is merely a drum switch in which the rotation of the drum under the actuation of a pedal serves to make the proper connections for starting and for charging. For starting, the voltage employed is 24, there being 12 cells of battery, and for lighting and charging a six-volt current is employed, the connections automatically being made in the switch.

Weight Reduced and Simplicity Gained.

By reason of the fact that the motor-generator unit takes the place of the engine flywheel it thus eliminates its weight, which, briefly, accounts for the fact that the addition of the system to a car does not increase its weight. The battery is carried in a cradle beneath the chassis frame, generally at the rear, and need never require attention other than that the cells must be filled with filtered water about once a month. As the acid does not evaporate to an appreciable extent, it never will be necessary to add it to the solution.

Incidentally, as the unit is direct connected to the gasolene motor, all forms of gearing are eliminated, and with them the necessity for lubrication or attention or care of any kind. Also, even the slight noises which may emanate from "silent" chains or spiral or herringbone gears also are eliminated.

Few Parts That Require Attention.

In caring for the U. S. L. system, there is practically nothing that will require attention other than the brushes and the commutator, information which applies to very nearly every other system on the market. As the commutator rotates at engine speed, which is fairly low as compared with the speed at which the commutators of not a few other generators operate, the brushes should wear almost indefinitely without the necessity for replacement. They should be examined from time to time, however, and cleaned of accumulations of carbon dust or other dust, which if permitted to collect will have more or less of an abrasive effect, which may be detrimental to the commutator.

In order to get at the brush ring and the commutator, the outside dust ring may be removed by taking out the bolts that serve to hold it in place; the ring is made in sections and should come away quite readily. Before removing the brushes, such dust as may have collected at the edges of the ring should be brushed away with a fairly stiff brush, after which grease or oil can be removed from the parts with a cloth dampened with gasolene. As the brushes are fitted with "pig tails," to assist in the collection of current, no attempt should be made to remove them entirely; it will suffice to take them out of their holders and wipe them with the dampened cloth used in cleaning the dust ring.

Proper Care of the Commutator.

Before replacing the brushes—they may be taken out merely by lifting the spring-returned arms that press them against the commutator—the commutator should be examined to make sure that it has not been cut or scratched. If it exhibits a brownish, glazed appearance, it may be assumed that it is in very nearly perfect condition, in which case it should not be touched. If, however, there appears to be difficulty in getting enough current properly to charge the battery and the commutator is caked with a hard, dry substance, or appears scratched or cut, it should be carefully cleaned by holding very fine sandpaper (preferably No. 00) against it while the motor is running. In any case, very great pressure should not be exerted; the better way is to grasp the two ends of a strip of sandpaper and, holding it taut, permit it to touch against the surface with just sufficient force to bring the ends about half an inch lower than the center.

The length of time required to bring the surface of the commutator to the proper condition naturally will depend upon its condition when the application is made. Perseverance, however, and light pressure are infinitely better than heavy pressure and a hurried job. Emery cloth never should be employed for the purpose, for tiny pieces of emery are likely to become imbedded in the comparatively soft copper and work future havoc with the commutator brushes.

Importance of Tight Connections.

Before replacing the brushes and the outside dust ring, make very sure that all the brush connections are perfectly tight, for there are few things calculated to create greater havoc with proper operation than loose connections. All nuts and binding screws should be tightened with a pair of pliers or with a small wrench, if provision for the use of one is made. Needless to add, care must be taken not to strip threads, or the nuts will work themselves off and may get in the mechanism and cause extensive damage.

The cut-out part of the system should require but infrequent attention, for it is in operation theoretically only when the motor is stopped and restarted, and the contacts, therefore, are subjected to very little wear. Occasionally they should be inspected and, if necessary, cleaned with a small, very fine file, or with a couple of pieces of emery cloth glued to opposite sides of a piece of thin Bristol board. As there is nothing in the regulator mechanism that moves, comparatively speaking, it will never require to be touched from one season's end to the next.

Johns-Manville Adds Radiator Shield.

Not content with the recent enlargement of its line of automobile specialties, which now includes brake lining, spark plugs, demountable rims, terminals, etc., the H. W. Johns-Manville Co., of New York, just has added a radiator shield for preventing the freezing of the water when the car is left standing with the motor stopped and also for cutting down the area of the radiator exposed to the air while running.

The shield consists of a thick layer of thoroughly cleansed cattle hair quilted between two layers of waterproof imitation leather. Near the top is an opening for admitting air to the radiator, and this is covered, when the car is standing, with a flap held in place by two snap hooks. The cover is made with outlines conforming to the shapes of the various standard radiators.

Motor Wagon Builds Half-Ton Car.

Apart from the 800-pound wagon employing a two-cycle, two-cylinder engine, the Motor Wagon Co. of Detroit now has ready for the market a half-ton car built of standard parts, and utilizing a four-cylinder, four-cycle motor; it also has three-speed selectively controlled gearset and double side chain drive to the rear wheels, which, of course, run on a solid axle; the wheels are shod with solid rubber tires. The standard body provides 22 square feet of loading space, the closed body types having a cubic capacity of 100 feet.

Effects of Adding Carbon to Iron.

The addition of a small percentage of carbon to pure iron, which is not a little like copper in softness and ductility, converts it into steel having hardening and other properties which vary with the percentage of carbon. Heating and suddenly cooling iron to which .25 per cent. of carbon has been added results in a slight hardening effect; 1 per cent. of carbon gives sufficient hardness for tools for cutting metal, while 2.2 per cent. of carbon produces a metal that is hard, brittle and not at all malleable.

HAZARD'S LATEST MODEL IS CHRISTENED "ERGON"

Unit Type With Long Stroke and Timing Drive by Chains—Starting and Lighting System Provided For.

Not content with merely designing a brand new motor, larger and more powerful than any of its previous models, the Hazard Motor Mfg. Co., of Rochester, N. Y., has also found a new name, for the engine has been christened "Ergon," from the Greek, meaning work or energy.

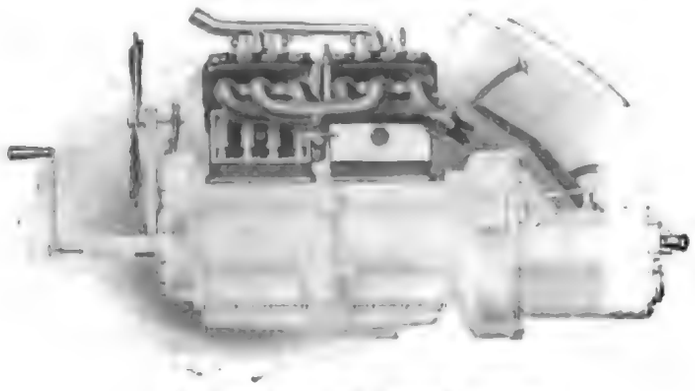
As the accompanying illustrations show, the motor is built on the unit power plant idea, the outfit including a dry plate clutch and three-speed selectively controlled gearset. By omitting the flywheel housing, however, the unit feature may be dispensed with if desired. The unit is designed for three-point support, there being two substantial arms cast on the flywheel housing for the support of the rear end, while the single suspension point in front is located under the end of the crankcase and directly in front of the oil reservoir. There is also a trunnion, cast integral with the front cover plate, through which the starting shaft passes; if desired, the motor may be supported by this instead of the boss. The lower support, however, is considered advantageous because it permits easy access to the camshaft drive.

The cylinders are cast in pairs, and are of the L-head type the stroke is long, being 6 inches as against a bore of 4⅜ inches. One of the up-to-date features of the engine is the abolition of gears for driving the camshaft, magneto and pump and the use of Renold silent chains for the purpose. Two chains are employed, one for the camshaft and the other for the shafts which impart motion to the pump and the magneto; a double idler, over which both chains run, serves to take up lost motion due to wear.

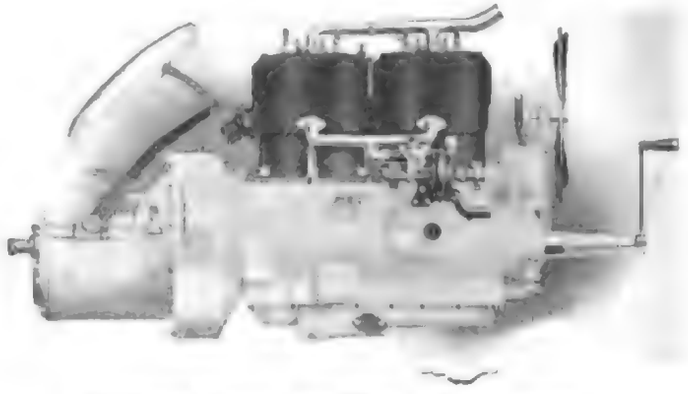
Clean design is a feature of the Ergon motor that stands out clearly. Not a little of the attractive outward appearance of the machine is due to the fact that the intake and exhaust manifolds are cast in a single piece and held in place on the cylinders by four studs. The carburetter is attached directly to the flange of the intake section of the manifold. On the opposite side of the motor there is only the water manifold and pump. All the valve stems of each pair of cylinders are enclosed in a single compartment with an easily removed cover plate.

A feature of the motor that is indicative of the tendencies of the times is the provision that has been made for the installation of an electric or pneumatic starting system, or electric lighting dynamo, a bracket being cast to take the pump, dynamo or motor and provision made for driving through silent chain. The arrangement is such that any one of a number of different systems may be installed with little difficulty.

The demand for motors, especially since the new model was brought out, has been so great that the Hazard company has discontinued the manufacture of control sets, which formerly constituted a portion of the manufacturing business.



VALVE SIDE OF ERGON MOTOR



OPPOSITE SIDE, SHOWING WATER PUMP

When too Much Kerosene Does Harm.

The use of kerosene for cleaning out carbon from the cylinders of a motor is a good thing; but if carried to excess more or less trouble is apt to follow. Too much kerosene will cut out all the lubrication and very considerably impair compression, and the oil left in the cylinders will mix with the gasolene and may tend to make ignition difficult and starting very hard. Further, the burning kerosene is likely to produce deposits of carbon, leaving the engine almost as bad, perhaps, as it was before the treatment was applied. A tablespoonful or two to each cylinder, according to the size of the motor, should be plenty, and it should of course be put in when the motor is hot, just after a run.

DIE-CASTING IN BRASS PERFECTED BY DOEHLER

Small Parts, Golden Yellow in Color and Exceptionally Accurate, Now Made in Molds—Details of Uunusual Process.

Materially widening the scope of die-casting operations, which heretofore have been more or less limited by reason of the necessity for employing comparatively soft material, the Doehler Die-Casting Co., of Court and Ninth streets, Brooklyn, N. Y., at length has perfected a method of die-casting brass parts, thus marking what is said to be the first practical demonstration of the art in America. In appearance and finish and the accuracy within which dimensions can be held—from .002 to .005 inches, depending on the general construction of the part—the brass die-castings appear much the same as the ordinary kind except that they are a golden yellow in color.

The process by which they are made, however, differs materially from the ordinary die-casting process, the brass being heated until it is only semi-fluid, or plastic, when it is forced into the molds under tremendous pressure. The pressure quite naturally results in greater homogeneity and obviates the possibility of common casting defects. The material which is used is high in copper and consequently is easily machined, though in the majority of cases machining is unnecessary by reason of the accuracy which is possible in casting. The brass shows a tensile strength of approximately 55,000 pounds to the square inch, an elastic limit of 40 per cent. of the ultimate tensile strength, and an elongation in six inches of about 20 per cent. For the present, operations will be confined to the formation of small parts weighing less than one pound and not exceeding three inches in over-all dimensions. Among other parts made by this process are gears, the teeth of which require no machining.

APPLYING PSYCHOLOGY IN THE MAKING OF SIGNS

How Big Signs May Fail Unless Properly Placed and the Lesson Taught by the Tendency Toward Smaller Ones, Placed Low—Harm That May Be Worked by Much Lettering—Necessity for Brevity.

That the psychology of the salesroom applies also to the store front is a fact that, unfortunately, is appreciated too little by many of those engaged in the automobile business. The salesroom is the place where the salesman meets the prospective customer, talks with him, points out the good qualities of the merchandise he has for sale and eventually makes the sale. In the equipment of the salesroom, the disposition of cars adroitly displayed in a suitable setting, commercial psychology plays an important part, the importance of which among us is evidenced in the well-defined efforts which everywhere are apparent to obtain a proper atmosphere—there is no other word for it—in the salesroom. But just as certain as it is that prospects are recruited from outside the salesroom—and probably chosen by the outside of the salesroom—so it certain that some form or variation of the psychology which assists in making sales within doors is applicable to the outside as well. The lack of such appreciation is readily to be found in signs and the methods employed in silently heralding or calling attention to what is contained within.

Tendency Is To Look Downward.

To those who are inclined to introspection there must have been remarked at one time or another in the course of their busy lives the wholly natural tendency to look down—at the sidewalk. It may be that the continual upheaval in which the streets of very nearly every large city generally may be found has instilled a natural timidity in the heart of the pedestrian that has served to make him even more cautious of where he places his feet, though it is more likely that the tendency is perfectly natural and is inherited from the days when antediluvian ancestors perched on tree branches and judged the distance they might fall.

Be that as it may, the tendency is there, and that it is known to exist and to persist is appreciated by a certain class of more or less clever advertising artists who have gambled on their perception to the extent of improvising various types of sidewalk signs, of which the miniature projectoscope, reflecting the time of night or an "ad" on the pavement, is the Omega and a liberal application of whitewash in a semblance of crude letters is the Alpha. The signs "take"; they catch the eye of the wary pedestrian who watches where he treads and the eye of him who watches the pavement in the hope of picking up something for nothing.

Top of Window Limit of View.

It is seldom that the average pedestrian casts his eyes heavenward unless his attention is attracted by an unusually glittering or rapidly moving object. The top of the



SIMPLICITY THAT FAILS OF EFFECT

store windows is about the limit of perfectly natural sight from the center of the sidewalk. It is possible, of course, to look higher, and it is altogether likely that "fixed glances" upward, along the row of uprising store fronts that have been squeezed out of ground floor positions will reveal almost a wonder-world of shops on upper floors, unknown and probably unsuspected before. It is a simple experiment that is recommended to those who are skeptical.

Big Signs and Their Usefulness.

It is here that the really big sign scores or fails. If it is one of those tremendous creations with letters five or six feet in height, and spaced nearly as far apart, its usefulness is limited unles it is placed well on high with a practically unlimited sweep in front of it and nothing to obscure it. The prime reason for any sign, of course, is to provide a means whereby "he who runs may read," though it may not be irrelevant to interpolate that the mere reading will do no good unless the tale told by the sign is specific and carries a message to the one who reads it.

That is to say, a tremendous sign blazoning to the world the single word "milk" or "tobacco" or any other plentiful commodity is insufficient in itself. It advertises milk, or tobacco, or whatever it may, and nothing else. The industry connected with the manufacture or production of that particular commodity is benefited, naturally, but the individual who is responsible for the erection and expense of the sign is not receiving proper dividends on the investment for the simple reason that the reader, who is or who may become a consumer, is as likely to purchase from any one of a hundred or a thousand dealers in that particular product as he is to deal with the owner of the sign.

Making the Sign Tell a Story.

Similarly, the mere advertisement of a single name with the aid of a sign is an oversight on the part of the person responsible for it. The name may signify a whole lot to those who are "in the know" or who are users or potential users of the products the name stands for, but there are so very few names unmistakably connected with products of universal use that, except in very few cases, the investment represented by the sign must result in a debit rather than a credit. To put it in perfectly plain language, it is altogether probable that in the majority of cases—it is almost a fact—that there are thousands who read the sign and know not what it stands for as against tens who read it intelligently and therefore may be expected to benefit its owner.

The value of every sign, be it big or little, obviously lies in its capacity for advertising something—a commodity or a process or a name. To perform its mission in life well it should hit the reader between the eyes in such a manner, and so quickly, as to leave an indelible impression. If the really large sign is far enough away, is not obscured and the lettering is clear, it may be expected to achieve its end. But where it is close at hand, or is partly obscured by

buildings or other signs, its value as an advertising medium is small at best.

"Quick look" signs which may be seen



MANY SIGNS, CLEANLY ARRANGED

and read at a glance are of the type that are sought now more than ever, for it would seem that their value, particularly in the automobile business, only within comparatively recent times has come to be generally recognized. The tendency toward big signs and big displays gradually is receding, and the reason for the change, at least where store windows form practically the only location for lettering, is not hard to grasp.

Injecting "Quick Look" Quality.

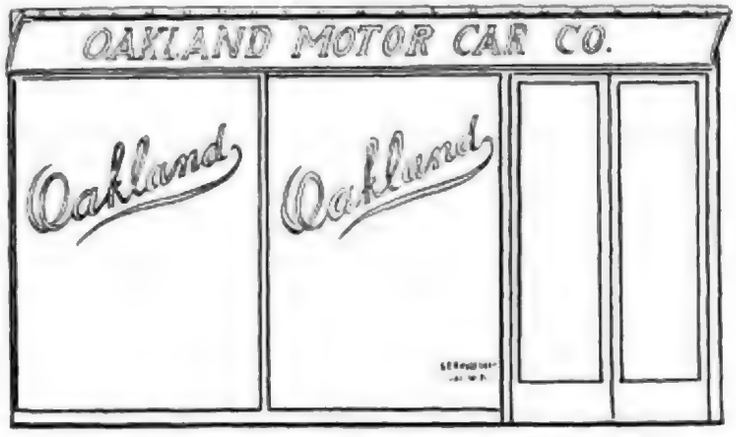
When the big sign is well placed it becomes virtually a "quick look" sign, as a single glance serves to convey the whole of it to the brain of the reader. But it is a mistake to place a big sign where it becomes necessary, by reason of narrow scope of vision, to take two looks at it or to screw one's head nearly off in endeavoring to obtain a continuous vision that shall convey the whole meaning of the sign.

For instance, one of the accompanying illustrations shows a typical Broadway (New York City) automobile show window with a single word—Marquette—on it in letters about 2½ feet in height. The sign serves its purpose in advertising the name of the car to those who pass in the trolleys or automobiles. But experience would seem to prove that those who ride in trolley cars are not very much interested in automobiles, from a purchaser's point of view, anyway—particularly in view of the fact that the car advertised is not a low priced one—and those who ride in automobiles generally are too much engrossed with the traffic problems at that particular intersection to pay much attention to signs.

The particular appeal of the sign, therefore, logically should be to the pedestrian, although even here the sign is not all that might be expected. In the diagrammatic sketch, the pedestrian's scope of vision is shown graphically. If he looks first at the center of the sign, which is more than likely by reason of the break in the window which serves to attract attention, he sees only the letters "quet" clearly. The others he sees less clearly, the initial "M" and the final letter "e" being almost entirely outside his scope of vision. If he really wants to see the sign, it is necessary for him to look again, possibly twice more, before the whole name is perfectly clear to him. Repeated looking, of course, may serve to impress the name upon his mind, but it is more likely that he will not take the trouble to turn his head, and in the majority of cases the value of the sign will be lost.

Getting Results With Small Signs.

In such cases, two smaller signs are infinitely superior to a single large one. The smaller signs are just as easily read from



SIGN ARRANGEMENT THAT IS EFFECTIVE

passing vehicles, they cost little, if any, more to place, and are very much more easily read by the pedestrian public. And as it is the pedestrian public which is most likely to be invited inside by signs, the value of catering to those who walk as much as to those who ride should be apparent without further dissertation. An excellent example of the case in point may be found in the windows of the Oakland branch in New York. Here there are two moderately large signs that are not too large to be read easily from the sidewalk, supplemented by a third sign, extending for the length of the two windows, and illuminated at night to make it plain to those who ride. Incidentally, both the smaller signs also can be read by those who pass in vehicles.

The other extreme is to place no signs whatsoever on the windows, after the practice of a few well-known jewellers on Fifth avenue—Tiffany, and Black, Starr & Frost, and others—and drygoods merchants on less conspicuous streets. Whether or not the practice is a good one is open to question. The lack of signs presupposes, in a measure, that the location of the place of business is sufficiently well known to a select clientele of purchasers whose expenditures are enough in a given time to support the business without the necessity for increasing the number by attracting the attention of passers-by with the aid of signs. Support of the fact would almost seem to be evidenced by the almost invariable rule that the larger the establishment the smaller will be the signs.

Where No Signs At All Are Used.

At several of the New York agencies for cars which enjoy the distinction of being classed with the "upper ten," for instance, signs of any description on the windows are conspicuous by their absence. At the Packard agency there are no window signs, nor are there any at the Peerless agency. In both instances, finality in conservatism is marked by small bronze tablets at either side of the massive doors. At the Peerless branch, however, a large illuminated sign high up over the center of one of the extensive show windows twinkles for the name "Peerless" after nightfall, though it is doubtful if anyone ever sees it during daylight hours. It is altogether too high



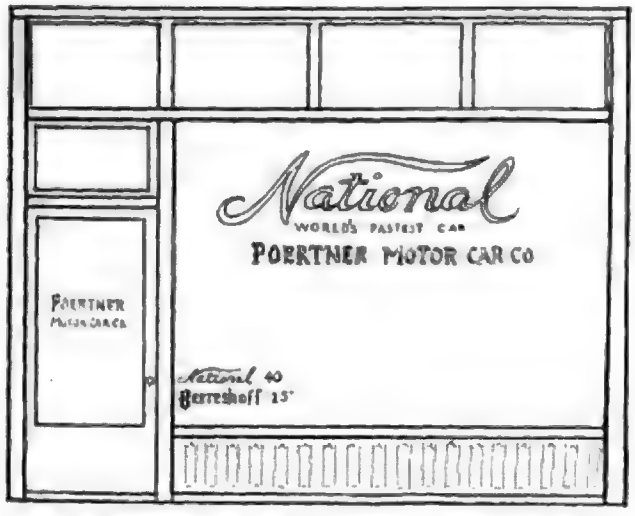
CONSERVATISM IN SIGN DISPLAY

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up to be seen from the sidewalk on the agency side of the street, and its "protective coloring" is such as to render it almost indistinguishable from the other side.

Tendency Toward Small, Low Sign.

As already has been made plain, signs that are located in high places are not worth their keep unless they are so placed that they come directly within easy vision, for the average person is indisposed to raise his or her eyes to a very much higher level than that marked by his or her own nose. That this fact is coming to be appreciated is evidenced by the growing tendency toward the use of smaller signs placed lower down. In not a few cases the lettering of such signs is scarcely more than two or three inches in height, and the whole sign is so placed that it comes directly in the line of rision of the passing pedestrian. Consequently, it cannot fail to attract attention, and as it is small and easily read—and easily remembered—its real value scarcely is to be disputed. In not a few cases such signs even are placed slightly lower than the level of the eyes, asumption having been correctly made that the natural tendency is to lower rather than to raise the eyes.



DISTINCTIVENESS IN LETTERING AS A GOOD EXAMPLE

Trademarks Used as Eye Catchers.

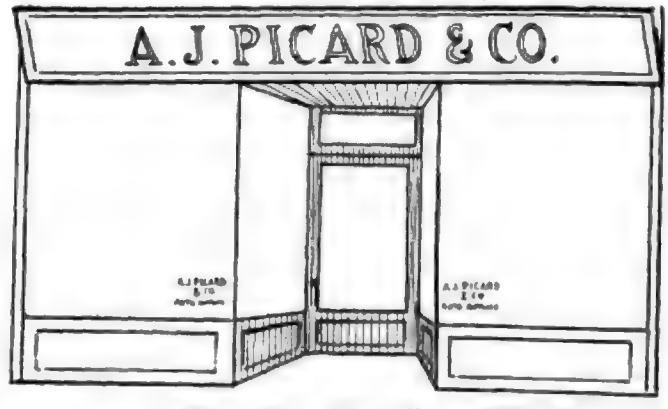
Such signs, of course, are practically worthless in spreading a particular doctrine to those who ride in trolleys or automobiles, for to them they are practically invisible. That is to say, they are invisible in the sense that they cannot be read and understood in the short time required to pass them in a fairly rapidly moving vehicle. In several instances, however, a ready means of making them not only visible but attractive as well has been evolved, with the aid of a little ingenuity. It is a pretty well known fact that the clearest way to make an impression is with the aid of pictures. Which, briefly, is the method employed by those who would have their signs understood even upon the briefest inspections. The pictures, however, are not really pictures, but are reproductions of a trade mark or a particular style of lettering made familiar to the general public through extensive advertising in newspapers and magazines. Thus, for instance, the well-known Hudson triangle appears on the Broadway window of the Hudson agency, and even though the lettering upon it cannot be read, the most superficial glance serves to make plain the triangle. Long association of the form of the device with the name of the cars has served to make the one very nearly synonymous with the other.

Much the same method is employed at the National agency, where the names of both National and Herreshoff cars appear in the lower left corner, done in the particular style of lettering adopted as distinctive by the manufacturer and extensively advertised as a sort of trademark. But even where such small signs do serve to convey their meaning by their shape alone, it is the better part of wisdom to supplement them by a larger sign, which may be read by both the pedestrian and the person who rides past either in a trolley car or in an automobile.

This has been done at both the Hudson and the National agencies, the example of the National agency serving to illustrate another angle of the very much mixed sign problem. Here not only is the name of the National car advertised in a manner that leaves little to be desired, but the name of the company which acts as the agency is advertised in a like manner. In this way the two names—that of the car and the agency—become connected in such a manner that the mention of one almost invariably serves to convey a picture of the other.

Absence of Letters Clears Window.

Obviously, there are two specific reasons for the choice of small window signs in preference to large ones. The first of these is to place them before the eyes of the walking public, from among which are recruited a goodly proportion of the prospects who enter a store, and the second is to leave the windows clear and unobscured for the display of cars or other merchandise, as the case may be. A. J. Picard & Co., of Broadway, New York City, for instance, leaves its windows practically devoid of lettering, except for small signs in the corners of both front panes, placed there especially for the edification of the pedestrian. A very much larger sign, extending over the width of the store apprises those who ride past in automobiles of the name of the firm—though there is nothing to indicate the nature of its business.



SMALL SIGNS EASILY READ BY PEDESTRIANS

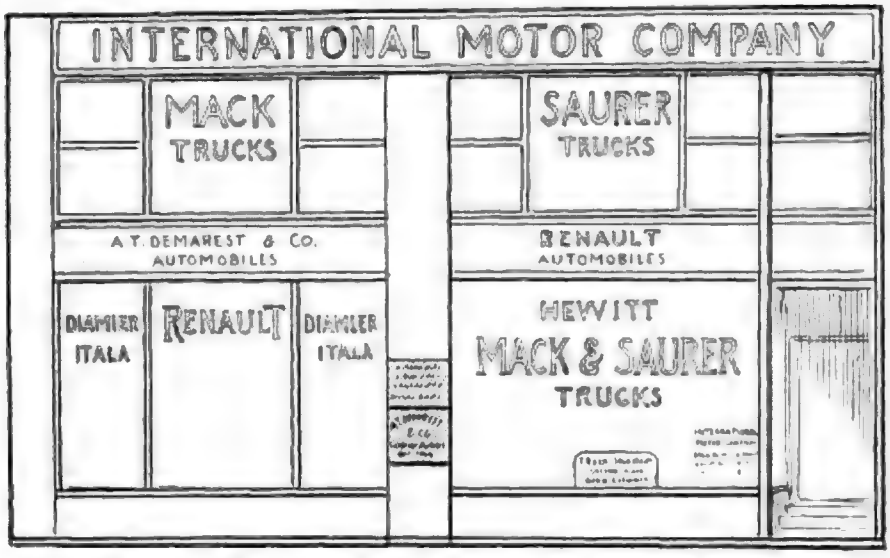
Primarily, the purpose of the show window is to permit the display of articles of merchandise—as its designation serves to make plain. Whether or not a secondary purpose may be added in extolling its merits as a repository for sundry letters and symbols making known the name and business of a firm is open to conjecture. Certain it is that a broad expanse of plate

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glass affords an excellent opportunity for the disposition of such advertising matter as may be included under the head "signs," though there is little room for doubt but that the placing of signs can be overdone, and overdone in a manner out of all proportion to the amount of good advertising that may be expected to accrue.

How Elaborateness Defeats Purpose.

If it is the purpose of a sign to make plain certain matters in such a manner that "he who runs may read," there is little sense in making that sign so elaborate and so complicated that neither he who runs nor yet he who walks can make head or tail of it in the time required for him to pass it. In the first place, elaborate signs, containing a multifarious assortment of names and addresses and trade-marks and names of products, to say nothing of several horizontal lines dividing the lettering into regiments and battalions and companies, defeats its own end for the reason that it cannot be read easily and quickly. And for this reason it seldom, if ever, is read at all. In the second place, it defeats the end of the show window, because it so obscures it that a view of the merchandise on display may be gained only under difficulty. Where the lettering is done in gold, there is the added disadvantage in the dazzling effect of the sun reflected ad nauseum in the faces of every passerby.



PROFUSE LETTERING WHICH OBSTRUCTS INTERIOR VIEW

In the case of the International Motor Co., for instance, there is so much lettering on the windows that it is difficult to see into the showroom and impossible in a quick survey to read all of the signs. Several careful glances are needed to assimilate all the information conveyed by the signs, and even then it is doubtful if the person of average intelligence could carry all the names in his or her head for any length of time. Of course, there are many products to advertise on the windows—three of them, to say nothing of Demarest's assortment—though it is quite conceivable that, with the aid of a little ingenuity, a much more suitable arrangement could have been found.

Effectiveness Through Electricity.

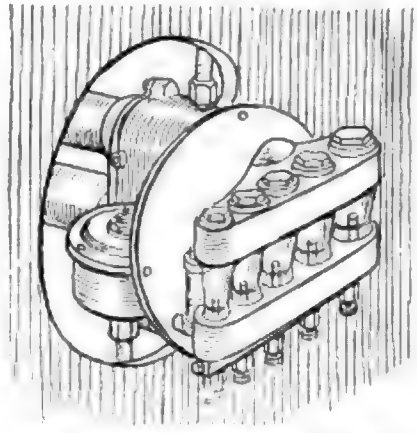
As a means of conveying specific information in a way that can be easily read and understood, electricity is becoming more to the front every day, vide the immense electric signs that turn Broadway nights into days. In this respect, that particular variety of small electric sign, mounted on small pedestals, which may be placed within a show window, has not yet reached the limit of its usefulness. Already several prominent automobile agencies, among which are Chalmers, Peerless, Hudson, Cole and Oakland and a few others, have adopted them as a means of attracting the attention of belated pedestrians, and it is altogether probable that if their batting average, as an advertising medium, could be ascertained, it would be found to be fairly high. The signs themselves are clever and, what is more to the point, they are odd.

Carburetter That Operates Visibly.

Although efficient carburation is considerably less of a problem than it was, there are those who believe that as a problem it looms considerably larger than generally is supposed, and their convictions are reflected in the various types of carburetters that almost continually are being placed on the market. Among them, the Gardner Visible, which is produced by the Gardner Carburetter & Brass Works, is unusual, to say the least, though its structure is no more unusual than is the location of its birthplace, which is Shreveport, La.; a Chicago office is maintained at 1546 Marquette Building.

The Gardner carburetter does not differ from a number of other carburetters in that it has a multiplicity of needle valves, but it does differ from all others in that the needle valves all are ranged side by side on the dashboard of the car. In fact, the whole carburetter is mounted on the dash, the float chamber and fuel and gas connections being on the driver's side. Each of the five needle valves is enclosed in its own individual glass tube, the whole device being so constructed that the mixing takes place virtually before the driver's eyes. In addition to the five needle valves, which are graduated in size, there is a sixth glass tube which serves to indicate the level of the fuel in the float chamber.

The reason for the unusual construction is to permit the driver to adjust the carburetter without leaving his seat, gas being delivered from the five needles successively as the engine speed is increased. Each needle is separately adjustable and it is expected that merely by glancing at the nature of the vapor passing through the tube or tubes, as the case may be, the operator will be able to judge whether faulty engine running is due to improper carburation. It is claimed that, inasmuch as the five needle valves come into "play" successively, gradually increasing the supply of fuel as the demand increases, the carburetter is automatic in a fuller sense of the word than is general and also that, after it has once been set it need not be touched again.



GARDINER "VISIBLE" CARBURETTER

How Tungsten Material is Obtained.

Tungsten, which is used for lamp filaments, is obtained from a previously prepared oxide by heating the oxide with carbon in an electric furnace. Much difficulty is experienced in removing the carbon and also various chemical impurities which tend to destroy the strength and uniformity of the metal.

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TAKING UP LOST MOTION IN WORN VALVE LIFTERS

How Friction Upsets Factory Adjustments—Where to Look for Trouble and How to Make Repairs to Lifters.

Despite the obvious importance of the timing of the valves in causing a gasolene motor to function to the best advantage, it is not usually the work of the repairman to go very deeply into the matter, for it is safe to assume that the valves were timed properly at the factory, which means that the cams were properly profiled and properly located in the first place, and that any errors in the relative times of opening and closing crept in through wear of the contacting surfaces of the valve lifters and stem ends, or else through wear of the roller pins, rollers, or of the cams themselves.

Where Trouble First Crops Up.

The common use of very hard cams with broad surfaces, of hardened anti-friction rollers on the lower ends of the lifters, and the usual profusion of lubrication, combine to keep down the wear of the cams and rollers to a minimum, and the effects of wear are first apparent in the lifters and valve stem ends. For worn cams there is only one remedy—new ones. The stem and lifter ends, however, usually are fitted with means for adjustment, and the maintenance of the proper clearance between the two surfaces is of no small importance to the running of the motor, not only so far as concerns the amount of power developed, but also in the amount of noise made.

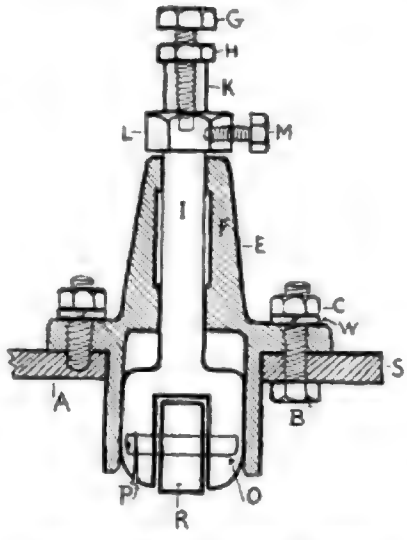
Magnification by Repetition.

The valve lifter and guide shown in the accompanying illustration are not of any specific make, but merely serve to indicate the method of making adjustments. While the existence of a gap between the lifter and the valve stem of, say, 1/32 of an inch, does not seem like a very big thing, it is made to look bigger by the application of a few figures. For instance, a motor running at 1,000 revolutions per minute will lift each of its valves 500 times a minute; which is as much as to say that in a four-cylinder motor there will be 2,000 intake valve and as many exhaust valve openings and closings. And if the lifters all are a little out of adjustment, it is easy to see how much any little effect is magnified by the constant repetition of the choking of the charge, or the holding back of the exhaust, or whatever it may be.

Manufacturers and dealers do not always devote quite as much attention as they should to the matter of giving explicit instructions regarding valve lifter clearance, and while a man with experience can make a very good approximation in adjusting lifters, the best and quickest work can be done only if he possesses exact knowledge on the subject. The simplest form of adjuster is that illustrated, consisting of a bolt (G) screwed into the tappet head (K) and provided with a locking nut (H) to bind it in position.

Indications of a Loose Tappet.

While such a lock-nut, well tightened down on a fairly fine thread, is not very likely to loosen and allow the adjustment to be lost, it will sometimes do so, and this tendency should be looked for, especially



CONVENTIONAL VALVE LIFTER

in a new engine. Should a nut loosen and allow the screw to work up, popping in the carburetter is apt to occur if the intake valve is affected, and in the case of the exhaust valve there will be popping in the carburetter and also a very perceptible falling off in power—usually more than if the intake valve is affected to a similar degree, though of course there will be loss of power and a considerable increase in the clicking noise of the tappet striking the end of the valve stem.

Gauging the Gap Under the Stem.

In the absence of anything more definite in the way of a gauge for tappet setting, the old-time plan of using an ordinary visiting card as a gauge answers very well. In making the adjustment the space should be just sufficient to allow the card to slip out when the valve is closed, with just a trifle of friction, showing that the card just touches both surfaces lightly.

It is an excellent idea for a repairman to accustom himself to thinking in thousandths of an inch, instead of the more common thirty-seconds or sixty-fourths, for the ordinary divisions of an inch are not sufficiently fine for anything but the roughest motor work. For instance, a sixty-fourth, which is a pretty small division of the ordinary sort, is equal, approximately, to fifteen-thousandths or, as it is written, .015. A piece of ordinary newspaper measures about three thousandths, or .003, and in some cases—rather rare ones, however—this is the amount of clearance that is allowed between the tappet valve stem. Usually, in such a case, one or two thousandths more clearance will do no harm and make no perceptible difference in the running of the motor. A rather common clearance is about eight thousandths (.008), and when this is specified the adjustment should be made sufficiently close so that a gauge two thousandths thicker will not enter the space. The sense of feeling is the most reliable guide to the proper tightness of the gauge.

Frictional Points That Need Watching.

Besides the wear that comes on the tappet head and the valve stem end, there will be, in course of time, a certain amount of wear in the roller pin (O) where it passes through the roller, and in the hole in the roller through which the pin passes. The amount of wear will depend largely upon the relative hardness of the parts and the areas of the bearings. If there is motion of the pin (O) in the fork (P) of the lifter there will be a certain amount of wear at this point also.

All this wear has the same tendency—to increase the clearance between the lifter and the stem, and, as long as the looseness is not serious, it can be compensated for by raising the adjuster. When the wear of the pin becomes more serious, however, it should be replaced with one which will take up all the lost motion.

New Pins for Anti-Friction Rollers.

Perhaps the most convenient material of which to make new roller pins is Stubbs's steel rod or finished drill rod, which comes in all diameters and is perfectly round, straight and polished. The quality of the steel is excellent in any of the better class of steel drill-rods or the like. The replacing of a pin means merely the reaming out of the holes in the tappet fork (P), enlarging the hole in the roller until it is true and cutting off a piece of steel rod of the proper diameter. The enlarging of the hole in the roller is not to be accomplished by reaming, however, for the roller is hardened. It could be reamed by softening the steel and rehardening it after enlarging the hole; but usually it is both better and cheaper to grind it out. This can be done

by chucking a piece of rod somewhat smaller than the roller pin in a lathe or electric drill spindle, first splitting the end of the rod with a hacksaw and inserting a piece of fine emery cloth which is wrapped about a turn and a half around the rod.

If the pin is to be hardened, the hole for the split-pin or locking wire should, of course, be drilled before the hardening is done. Incidentally, Stubbs's steel and drill-rods, being of tool steel, must be hardened all the way through.

The large nut (L) with set-screw (M) is intended for use when removing valve lifters to prevent the lifter from falling into the crankcase. If the adjusting screw and its lock-nut are removed and the guide (E) lifted from the crankcase the whole lifter is apt to slip through the guide if it is not held in some way; somehow this is a very easy thing to forget. The nut is smoothed out by running a drill or reamer through it to remove the threads and a hole drilled and tapped for the set-screw.

Should the lifter guide (E) be worn where it is in frictional contact with the lifter stem (I) there will be side motion or rocking of the lifter, which should not be allowed to go very far. Whether the repairman's work should consist in bushing the old guides, or in fitting new ones, depends very largely on the cost of the new parts, and it is not possible to make suggestions owing to the wide difference in the construction and cost of various lifter guides. It sometimes happens that it is not practicable to insert a bushing because of the thinness of the stock in the walls of the guide. When, however, a bushing is to be made, it is not a difficult matter to machine it up from a cored bar of bronze, or even to bore and turn a solid rod if no cored bars are at hand.

It should be noted, before putting in a bushing, whether there is a relieved section in the guide, as shown in the accompanying illustration. These spaces often are of great importance, being intended as oil traps, and should not be ignored. Also, before finishing the bore of the bushing, the lifter stem should be trued up, should this be necessary, as sometimes is the case.

The final touches should be put on the bore of the guide bushing by passing a reamer through it, a parallel reamer if one is available. Otherwise an expansion reamer will answer. Of course, the reaming may be dispensed with if the boring is done with care and skill; but it tends to increase the life of the guide.

The cutting of oil pockets should be the last operation in making the guide. Care should be taken not to make them so deep as to part the metal of the bushing or to make it too thin and weak. Of course, any little rough edges left after cutting the oil pockets should be taken off. In replacing the guide on the crankcase a thin paper gasket and a little shellac will prevent the leakage of oil, if there is any tendency in that direction.

Shaler Develops a Low Priced Vulcanizer.

Applying the principle that a vulcanizer should do its work by holding a certain de-

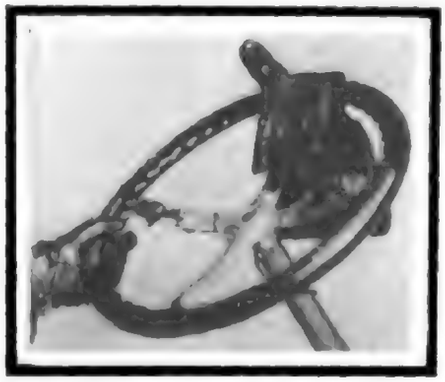


gree of heat for a specified time, rather than by heating up and gradually cooling down, the C. A. Shaler Co., of Waupun, Wis., has brought out a small portable vulcanizer which is styled Vul-Kit.

The accompanying illustration shows the general appearance of the new vulcanizer and the construction of the universal clamp. The detachable handle permits the removal of the device from a tire without waiting for it to cool. The heating element consists of a gasolene lamp which does not burn raw gasolene but converts it into gas, and distributes the flame evenly over the bottom of the heating plate. The design is such that the correct degree of heat is attained, and this is maintained steadily until the work is finished. An asbestos pad is let into the shelf on which the tube to be vulcanized is placed, retaining heat and preventing the pinching of the tube.

Glove that is Warmed by Electricity.

Common though the expression "warm gloves" has been ever since there were



gloves, it has remained for the automobile to bring out, by creating a demand, a type of glove that actually is warm in itself, and not merely a retainer of the heat of the human hand. Such is the Carron electrically heated glove, manufactured by Carron & Co., of New York City, which recently was incorporated with an authorized capital of $20,000.

Interwoven with the gloves are heating coils of resistance wire, so calculated as to give a gentle warmth when the current from a 6-volt ignition battery passes through the wire. On opposite sides of the steering wheel are two pairs of plates connected with the battery, and there are metal contact pieces on the gloves so arranged that each glove has its complete individual circuit through which current passes when the wheel is grasped and the plates brought into contact with the heater contacts. There are also two diminutive rheostats, one for each hand, so that the heat can be regulated separately for each. The accompanying illustration shows the appearance of the gloves and the contact plates on the wheel. An insulated cable carries the current from the battery to the plates.

Purpose of Threads in Aluminum.

Studs used for attaching valve lifter guides, etc., to crankcases are apt to work loose if merely screwed into the soft aluminum, and therefore they are safer if screwed through and a split-pinned nut put on underneath. The thread in the aluminum is useful not for taking the strain, which is done by the nut, but for preventing the stud from falling into the crankcase when the guide is removed.

Tire Injury That Increases Damage.

A deep cut in a tire, which partly severs a piece of rubber and allows it to flap, should receive immediate attention for the particular reason that the loose piece is apt to tear off more rubber and so make the damage worse than at first. This is particularly true of solid tires. Of course, a bad cut should be taken care of immediately in any case; the foregoing is merely an extra reason for avoiding delay.

Current Lost by Poor Adjustment.

One of the causes of excessive current consumption in ignition systems employing vibrator coils is excessive tension on the vibrator springs. The spring adjustment should be slackened until the motor commences to miss explosions and then tightened down gradually until the firing again becomes perfectly regular. Further tightening results only in useless consumption of current.

Grease That Interferes With Filing.

Passing a greasy hand over the surface of cast iron that is being filed is sufficient to make the file slip and fail to "bite" without the application of considerable pressure, especially if the file is a little worn and dulled by use.

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BOSTON CHAUFFEUR WINS BIGGEST WINTON BONUS

Dondero Spent Nothing for Repairs in Driving 27,000 Miles — Twenty Others with Remarkable Records Share $3,500.

John L. Dondero is one Bostonian who enjoyed a merry Christmas and a happy New Year. Dondero, who is chauffeur for F. M. Hauthaway, received $1,000 for a year's work outside of his salary, and the money was earned in a way which is not generally attributed to chauffeurs. He was a winner of the first prize in the fifth annual "upkeep contest" of the Winton Motor Carriage Co., and earned the $1,000 by driving 26087 miles with no repair expense other than for tires.

Second prize, $500, went to William J. Green, chauffeur for E. L. Smith, of Chicago, who covered 22,928.8 miles with no expense; third prize, $250, to Thomas Murray, driving for J. M. Anderson, of Medford, Mass., who covered 16,477 at an expense of 95 cents; fourth prize, $150, to Alcide Bedard, chauffeur for Charles B. Mauran, of Providence, R. I., who traveled 16,245.3 miles at an expense of $18.01.

The other sixteen prizes of $100 each were distributed as follows: E. P. Brubaker, 15,729 miles, no repair expense; J. Walter Tracy, 14,022 miles, no repair expense; J. F. Folger, 14,474 miles, 75 cents; Frank Schneider, 14,431 miles, $3.60; Herbert Hecker, 12,541.8 miles, no repair expense; L. V. Wright, 12,716 miles, 15 cents; A. N. Peters, 13,845.4 miles, 95 cents; E. A. Hodge, 13,441 miles, $21.22; Harry Batch, 15,333 miles, $53.65; S. J. Meneely, 11,743.3 miles, $5.35; John L. Scott, 12,271 miles, $25.35; Joseph H. Gallo, 11,307 miles, no repair expense; Wm. Ahrens, 11,150 miles, no repair expense; E. E. Stokes, 11,126.3 miles, no repair expense; Clarence Finley, 11,-1005 miles, $1.25; Wm. J. Armstrong, 10,870 miles, 85 cents.

Four chauffeurs who were hot contestants for big money reported total mileage of sixty miles, but their records were not accepted because they had permitted their odometers to remain out of order at one time or another.

Races Train to Avoid Collision.

Presence of mind has saved many a skin, and even though it did not save the skins of Dr. Leo H. Joyce and three others who were riding with him in his car, it saved their lives at least. Dr. Joyce coasted down a fairly steep incline toward the Susquehanna railroad tracks that enter the town of Butler, N. J., and at the critical moment an express train loomed large around a curve. As there was not time to check the momentum of the car sufficiently to prevent the collision that was imminent, Dr. Joyce did the only other thing he could do to avoid the smash. He turned his car quickly onto the railroad tracks ahead of the train, at the same time shouting to his guests to jump down the embankment, which they did. Instantly afterward the car was struck by the locomotive and hurled 30 feet, a tangled mass of junk. Dr. Joyce was catapulted from his seat and landed some 72 feet further away from the scene of the accident than did his car. Both his knee caps were broken, as was one wrist; the others in the party escaped with their lives, though they were found to be severely injured. The engineer of the train stated that Dr. Joyce had taken the only possible chance to save his own life and the lives of his guests.

"Boycott" to Check Speeding Taxicabs.

Just how to curb the racing proclivities of the drivers of the taxicabs which pass through the Presidio Reservation in California, is a problem which long has troubled Col. Cornelius Gardener, commander of the post. He has at last hit upon a scheme which, he believes, will prove effective, in that if put in operation the taxicabs will have but scant reason to pass through the reservation. Col. Gardener's method, as put forth in an edict which he has sent to the companies operating the cabs, is to have the army officers and their friends "boycott" the cabs of those companies which do not force their drivers to observe the traffic rules which adhere within the limits of the reservation, and since such a procedure would mean the elimination of at least half of the revenue derived from the operation of the services, it would seem that the colonel's method will prove highly effective.

Berlin to Use Electric Cyclecars.

The city of Berlin, which always has been progressive in the matter of using automobiles in public service, has been experimenting with electric cyclecars, and the results have been sufficiently satisfactory to warrant the purchase of several machines having a carrying capacity of 500 pounds and a maximum speed of 18 miles an hour. They are for postal service.

Huyette Again Heads Quaker Club.

Paul B. Huyette was unanimously re-elected president of the Quaker City Motor Club, of Philadelphia, at the annual meeting and election of officers. The other officers chosen are: First vice-president, G. Douglass Bartlett; second vice-president, I. T. Shoemaker; treasurer, Ralph L. Murray; secretary, A. Earl Adams

TWO-MILE MOTOR SPEEDWAY PROMISED FOR LONG ISLAND

New Jersey Project Abandoned in Favor of New York Location—Work to be Commenced Soon and First Race July 4th.

Because stock in the Metropolitan Motor Speedway Co., which was to have built a two-mile speedway on the New Jersey meadows, opposite New York City, did not sell as rapidly as was supposed would be the case, and despite reports to the effect that engineers had been hired and that work had been started on the project, the venture definitely has been abandoned. In its place there has been launched the New York Motor Speedway Association, identified with which are a number of men who were connected with the New Jersey venture and which just incorporated under the laws of New York State with $1,000,000 capital stock. Just who are the men concerned has not been divulged, nor will it be known until to-morrow, when the election of officers takes place.

The new association will take up the work of the old virtually where it was left off, with the exception that a new location for the speedway has been chosen. With the aid of such real estate "wizards" as Lewis B. Fish, of Fish & Marmon, and Gage E. Tarbell, a plot of ground some 650 acres in extent on the Hempstead plains between Garden City and Mineola on Long Island has been leased, the exact location being the fenced tract bounded by the Old Orchard road on the north, Whale Neck avenue on the east, Clinton road on the west and the Motor Parkway on the south, that has been used for the past year as an aviation field. The lease is to run for 10 years, with the option to purchase the land at a flat price of $3,000 an acre any time within two years from April 1st.

According to present plans, it is proposed to permit the 40-odd hangars now on the ground to stand until such time as the erection of grandstands, which, by the way, are to seat between 75,000 and 100,000 persons, makes necessary their removal. March 1st has been set as the date for the commencement of operations on the speedway, which is to be an oval, two miles in circumference, and it is hoped that the first real racemeet can be staged on Independence Day. If plans are carried out in full, there will be weekly matinee racemeets held on Saturday afternoons and several more important races during the season, to say nothing of aviation exhibitions, motorcycle contests and possible variations in the way of athletic meets.



1,021,197. Vehicle Driving and Braking Means. Alvaro S. Krotz, Chicago, Ill., assignor to Sears, Roebuck & Co., Chicago, Ill., a Corporation of New York. Filed Dec. 16, 1908. Serial No. 467,864. Internal expanding brake housed in casing on the driving sprocket.

1,021,219. Igniting Apparatus for Gas Engines. Elihu Thomson, Swampscott, Mass., assignor to General Electric Co., a Corporation of New York. Filed April 5, 1906. Serial No. 310,034. Means for automatically advancing the spark as the speed of the motor increases.

1,021,220. Vaporizer for Internal Combustion Engines. Elihu Thomson, Swampscott, Mass., assignor to General Electric Co., a Corporation of New York. Filed July 14, 1906. Serial No. 326,177. Vaporizer concentric with exhaust valve stem and housed in valve pocket.

1,021,279. Headlight Controller. Francis E. Thompson, Arlington, Mass. Filed March 2, 1911. Serial No. 611,782. Connection between steering post and lamp provides means of turning latter.

1,021,282. Fluid Clutch. Paul Weeks, Los Angeles, Cal. Filed March 20, 1911. Serial No. 615,784. Intercommunicating cylinders positioned on one rotatable member with pistons actuated by driving member and a valve for controlling the rate of passage of the liquid between the cylinders.

1,021,307. Vehicle Wheel Tire. Luke G. Fleming, Tarrytown, N. Y. Filed Jan. 25, 1911. Serial No. 604,523. Split casing provided with a woven wire fabric tread which serves to keep the split closed.

1,021,326. Hydrocarbon Vaporizer for Internal Combustion Engines. James William Mowbray, Gleichen, Alberta, Canada, assignor, by direct and mesne assignments, to the Hydro-Carbon Vaporizer Limited, Fort William, Canada. Filed July 3, 1011. Serial No. 636,696. Single jet device, with jackets provided for heating mixture.

1,021,334. Radiator. Theodore D. Robinson, Lockport, N. Y. Filed April 11, 1910. Serial No. 554,655. Means of forming and supporting tubes in a vertical tube radiator.

1,021,355. Spring Wheel. John C. Deckard and Isaac L. Deckard, Vincennes, Ind. Filed May 23, 1911. Serial No. 628,930. Helical springs between outer rigid rim and the felloe.

1,021,422. Tire for Vehicle Wheels. Tod J. Mell, Youngstown, O., assignor to the Republic Rubber Co., Youngstown, O., a Corporation of Ohio. Filed Dec. 23, 1910. Serial No. 598,979. Reinforcing wire, wound spirally at the base of solid tire and provided with protective covering of hard rubber through which pass anchor bars.

1,021,435. Vehicle Fender. Edgar M. Thompson, Richmond, Ind. Filed Nov. 8, 1911. Serial No. 659,107. Frame released by contact with the object swings down to form a barrier between object and the wheels.

1,021,440. Resilient Wheel. Rex E. Arnold and Clarkson P. Hockett, Kouts, Ind. Filed June 29, 1911. Serial No. 636,045. Spokes formed of spring steel and bowed.

1,021,459. Vehicle Wheel. Edward A. Glenn, Chicago, Ill. Filed Jan. 20, 1908. Serial No. 411,697. Renewed Aug. 11, 1911. Serial No. 643,639. Helical springs between the hub and rim.

1,021,470. Automobile Body. Louis W. Oster and Frank J. Miller, Cleveland, O.; said Oster assignor to said Miller. Filed March 20, 1911. Serial No. 615,706. Means for converting five-seated body into a two-seated body.

1,021,493. Engine Starter. Gerald S. Sutliff, Perry Creek township, Vigo county, Ind. Filed July 8, 1911. Serial No. 637,479. Ratchet mechanism.

1,021,506. Circuit Breaker for Magnetos and the Like. Richard H. Cunningham, New York, N. Y. Filed Feb. 8, 1911. Serial No. 607,269. Lever operated by suitable cams, breaks the circuit.

1,021,240. Pneumatic Hub for Vehicle Wheels. Tossanus Duysens, Maastricht, Netherlands. Filed April 20, 1911. Serial No. 622,208. Pneumatic cylinders between hub and wheel rim.

1,021,246. Vehicle Tire. Wilhelm A. Giermann, Blencoe, Ia. Filed Oct. 11, 1911. Serial No. 654,145. Tread formed of arched springs.

1,021,247. Wheel Hub. Friedrich Wm. J. Goersch, Cleveland, O. Filed Jan. 16, 1911. Serial No. 602,929. Cone on bearing sleeve, operating in a conical socket supporting the spokes and pressed by a spring, tends to keep the rim concentric with the bearing sleeve.

1,021,251. Spring Suspension for Road Vehicles. Leonard Harris, London, Eng. Filed June 17, 1911. Serial No. 634,182. Pneumatic bulb with suitable supporting brackets instead of spring shackles.

1,021,254. Muffler. Herman H. Larkins, Princeton, Ky. Filed Sept. 2, 1911. Serial No. 647,311. A series of cylinders with inlet and exhaust pipes each protruding past the middle portion of cylinder.

1,021,275. Headlight for Automobiles. Anton Stepanek, Newcastle, Ind. Filed Oct. 31, 1911. Serial No. 657,787. Chain gearing between steering pivot and lamp pivot provides means for rotating lamp.

1,021,765. Automobile-Primer. Wilber R. Dunkel, Pana, Ill., assignor of one-half to Carter R. Scroggin, Harristown, Ill. Filed Dec. 13, 1910. Serial No. 597,110. [Measured quantities of gasolene injected into the cylinders.] 5 claims.

1,021,779. Automobile Brake and Jack. Paul Janek, Cleveland, Ohio. Filed April 17, 1911. Serial No. 621,472. [Sprag which also serves as a jack.] 2 claims.

1,021,783. Wheel-Rim for Pneumatic Tires. Carl George Kleinschmidt, Herne, Germany. Filed June 1, 1911. Serial No. 630,654. [Means of locking the locking ring on a Q. D. tire.] 3 claims.

1,021,791. Explosive-Gas Engine. Lewis R. O'Neill, Montclair, N. J. Filed April 29, 1911. Serial No. 624,123. [Two cycle motor with separate compressing cylinder.] 6 claims.

1,021,796. Automobile-Fender. John P. Randerson, Albany, N. Y. Filed Oct. 14, 1910. Serial No. 586,999. [Means for holding springs in telescoping tubes.] 11 claims.

1,021,812. Starting Device for Explosive-Engines. Edward M. Wood, Worcester, Mass. Filed April 7, 1910. Serial No. 553,914. [Modified air starter.] 10 claims.

1,021,816. Outer Cover for Pneumatic Tires. John Charles Barker, Leeds, England. Filed June 28, 1911. Serial No. 635,704. [Staggered tread.] 7 claims.

1,021,824. Oil-Indicator for Automobiles. John Elmer Campbell, New Castle, Pa. Filed Sept. 27, 1911. Serial No. 651,598. [Pet cock and means for operating it.] 14 claims

1,021,879. Governor for Explosive-Engines. Louis J. Monahan, Oshkosh, Wis., assignor to Termaat & Monahan Co., Oshkosh, Wis. Filed March 25, 1911. Serial No. 616,940. [Centrifugal governor limits the operation of suction inlet valve.] 2 claims.

1,021,889. Route-Indicator. Jay B. Rhodes, Kalamazoo, Mich. Filed April 4, 1911. Serial No. 618,912. [Combined odometer and road map.] 17 claims.

1,021,923. Universal Joint. Allen H. Fetzer, Galion, Ohio. Filed June 3, 1910. Serial No. 564,764. [Ball and socket joint with feathered pins.] 1 claim.

1,021,939. Starting Device. James McNamee, Amsterdam, N. Y. Filed Aug. 15, 1910. Serial No. 577,254. [Friction disk clutch interposed between starting handle and crankshaft.] 3 claims.

1,021,972. Friction-Clutch. Henry Druschel, Manheim, Pa. Filed Jan. 3, 1911. Serial No. 600,603. [Expanding ring clutch.] 2 claims.

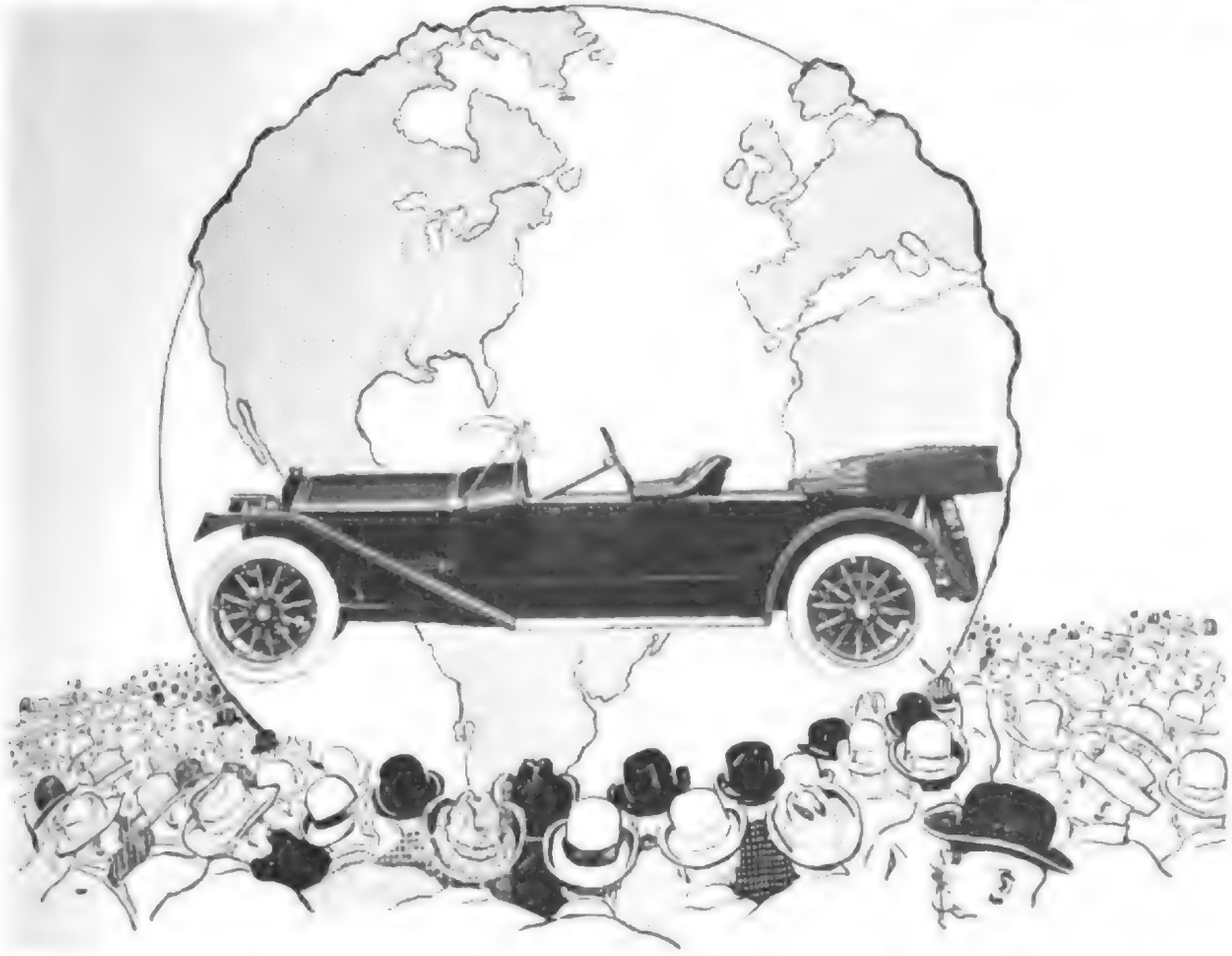
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Long stroke (4½x6) flexible and noiseless Motor with enclosed valves.
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Gray & Davis Electric Starter, easily operated by simply touching a button with foot.
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12-inch Turkish Upholstery.
Full heavy nickel Trimmings.
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Adequate Baggage-carrying Compartment concealed in body but easily accessible.
Powerful and reliable Brakes.
Spacious Interior.
Tire Pump, integral part of the motor. Inflates a tire in three minutes.

128-inch Wheel Base.
Adjustable, ventilating and rain vision Wind Shield.
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Hoffecker steady-hand Speedometer.
Truffault-Hartford Shock Absorbers in rear.
Tire Carrier in rear.
Silk mohair Top, Cover and Curtains.
Full-floating Rear Axle.
Resilient Springs, ¾ Elliptic in rear; Semi-Elliptic in front.
Large gasoline pressure-feed Tank with Gauge in rear.
Robe Rail and Foot Rest.
Foot Mat in Running Board.
Plain, continuous enclosed Metal Guards.
Easy riding qualities, unexcelled.
Oiling System, demonstrated to be only perfect oiling system.

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"For 10,000 miles—ever since I bought it—my National "40" has been running like a clock. It is the very essence of distinctiveness, comfort and power. I consider it the last word in motor efficiency"—and this man has the money to buy any car on earth.

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We can supply you with more letters like this and better. They are great selling aids. The dealer's largest asset is satisfied customers. They influence sales for you—they keep you in business year in and year out.

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Please send me at once your Improved Series V catalog and dealers' proposition.
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The selling price of the Warm Hand Wheel, $15, puts it within reach of every man who owns a car. You, as a dealer, can figure out just how many sales you could make through a simple demonstration.

This is the season for quick sales. Now is the time when cold hands on the steering wheel cry out for relief, and you are overlooking a sure seller if you have not investigated the Warm Hand Wheel.

This steering wheel is a positive necessity for winter driving. It keeps the hands comfortable (even without gloves) no matter how cold it may be. There is nothing complicated or delicate in its construction. It is simple, effective and lasting.

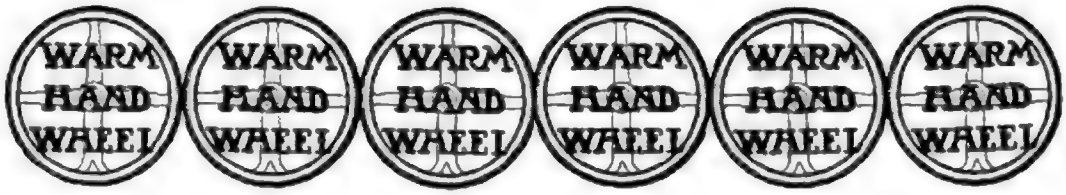
In the operation of the Warm Hand Wheel but little comment is needed. It works to satisfaction on batteries or lighting plant. On Ford cars the built-in flywheel magneto will heat it to perfection.

Installing the Warm Hand Wheel takes but little time and you don't have to interfere with a single working part of the car.

This is our message to you, Mr. Dealer—and back of it is a selling proposition that you are losing out on every day you put off writing. Let us get together right now, when midwinter makes the Warm Hand Wheel look mighty good to every driver who gets his hands on it.

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You would look far more dignified and be better satisfied with yourself and your car if you sat in your seat and allowed an Electric Self-Cranker to do the work for you.
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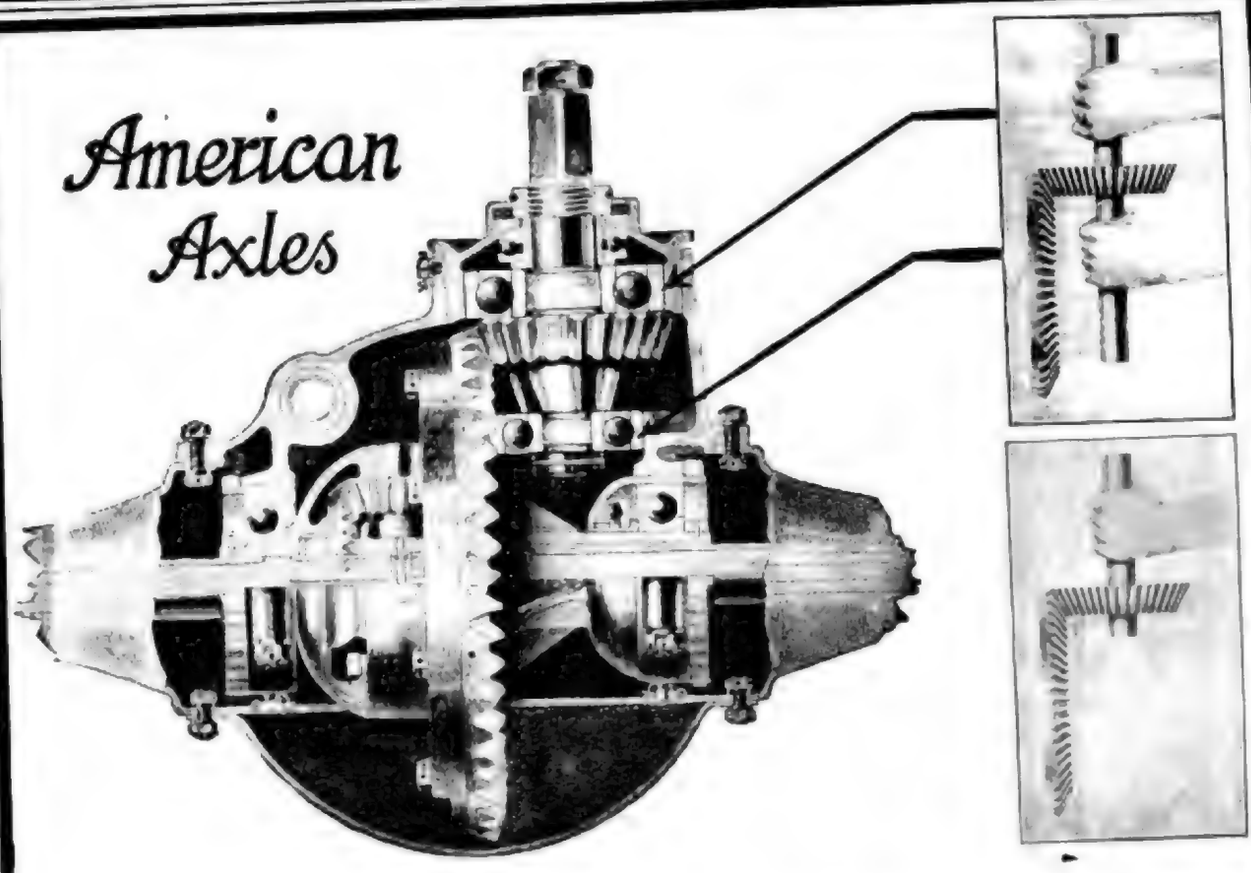
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American Axles



This High Class and Costly Construction Is To Be Found Only in American Axles

In *American Axles* of the bevel type, the pinion shaft has bearings on either side of the pinion.

The shaft has, therefore, the strength and security typified by the two strong hands in the small, upper illustration.

Cheaper construction omits the inboard bearing and endeavors to support the shaft in a one-handed fashion which proclaims its own weakness.

To add the inboard bearing, with its support an integral part of the housing, is much too costly practice for cars sold at the lower prices.

But for cars that must have the best of construction, the cost is more than justified in the continued maintenance of its originally perfect adjustment and the entire absence of noisy vibration.

American Axles equipment instantly establishes in your mind a sense of highest class: it supplies a basis by which you can unerringly judge a car.

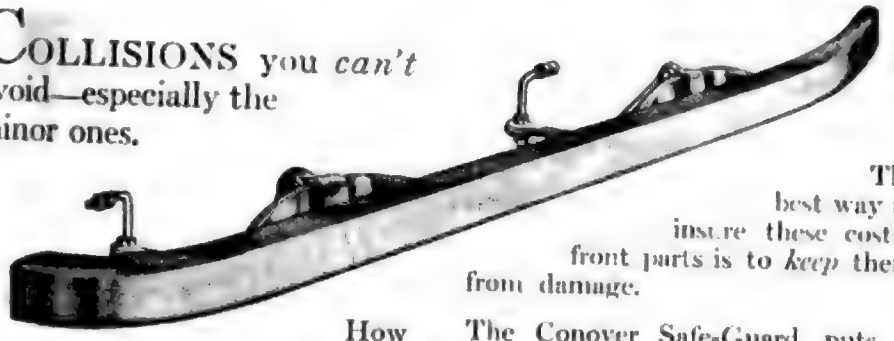
The American Axles line includes, besides our bevel gear, the Lanchester-Daimler Worm Drive, to which we have the exclusive use as axle manufacturers in America.

THE AMERICAN BALL-BEARING CO., Cleveland, Ohio

THE TRUTH

of the matter simply is—that you cannot insure your car completely and satisfactorily without a Conover Safe-Guard

COLLISIONS you *can't* avoid—especially the minor ones.



The best way to insure these costly front parts is to *keep* them from damage.

How can you tell when a frightened horse, or another car, will back into your mudguards, lamps, wheels, radiator? Or when your brakes won't work in time? These accidents are countless, daily occurrences.

You may collect insurance, but if the damage sustained is under $25.00, you can't collect at all. In any event, there's the trouble and the wait for your car to come back from the repair shop.

The Conover Safe-Guard puts a massive, sightly barrier all around them. It takes the bumps—against its broad, flat surface and its sturdy, semi-elliptic, four-point-contact springs. If dented, you hammer it back; if broken—any time within two years—you can get another Conover Safe-Guard *free*.

It is built for *protection*—sold to you for *protection*—and its cost is less than the damage your car is bound, sooner or later, to sustain without it.

Best quality of steel heavily enameled in black, royal blue, French gray or maroon; bar 2 inches wide. **$15.00**
(Any other color of enamel $5.00 extra)

Best quality of steel, brass or nickel plated; bar 2 in. wide **$17.50**

Solid bronze, finished in either brass or nickel; bar 2 in. or 2½ in. wide **$25.00**

Shipped, express paid, anywhere in the United States, on thirty day's trial, upon receipt of the regular price. When ordering, give name and model of car. Specify size and finish desired.

An attractive booklet will be sent free upon request.



LOVELL-McCONNELL MFG. CO.
Sellers : Newark, N. J.

NEW JERSEY TUBE CO.
Makers : Newark, N. J.

CONOVER

The Dependable Safe-Guard



TIRE ECONOMY
IS MEASURED BY
TIRE INFLATION

You Carry
Tire Insurance
When You Carry A

Schrader Universal
Tire Pressure Gauge.

AND USE IT.

ASK YOUR TIRE MAKER.
For Sale by Tire Manufacturers, Jobbers, Dealers, Garage Men and

A. SCHRADER'S SON INC.
33 Rose St. NEW YORK

PRICE $1.00





$1.00

buys the best Plug obtainable irrespective of price. "Locating the Spark Plug" and the Bosch Plug booklet tell you why and prove it.

Write for them now.

BOSCH MAGNETO COMPANY
223 West 46th Street NEW YORK

BOYCE MOTOMETER
PAT'D PEND'G

1913's TRADE SENSATION

Know the Exact Heat of Your Motor While Driving



(Front view ½ actual size.)

The Motometer is a watchlike instrument fitted to the radiator cap, protecting the motor from damage caused by improper lubrication, overheating, defective cooling, etc. By means of a red fluid indicator it warns you.

When the Radiator Needs Water

When Oil Supply Is Insufficient

In short, it tells whatever excessive heat tells—a broken water pump, a clogged pipe, a broken fan belt, etc., and tells before the damage is done.

Attached the same as an ornament, readily visible from the seat day or night. It will prevent frozen radiators in winter and cracked cylinders in summer.

Finished in black enamel with gold plated or nickel rims.



Price $10

View from Seat

The Motometer Company, Inc.
904 U. S. Rubber Bldg.
Broadway and 58th Street, New York

Exhibiting—Madison Square Garden Show, Space 540, Basement

STUTZ

You Should Know More About the Stutz

Any manufacturer can build a beautifully finished and luxurious car—but only the real worth of a car comes in the construction.

The STUTZ is made right from the radiator to the rear axle. Every ounce of material, every detail of workmanship that goes into every STUTZ car is absolutely the best.

The STUTZ has a powerful motor that will pick up on any road or hill at the touch of the throttle. It has attained a record second to none for consistent performance.

Every STUTZ car is exceedingly easy-riding and comfortable. The straight line low slung body, deep upholstery and luxurious appointments of the STUTZ give it that aristocratic design that lends dignity and quality to a high class motor car.

STUTZ MODELS

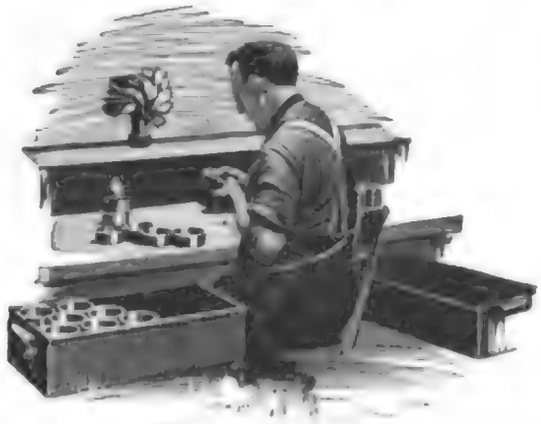
Six-cylinder, six-passenger touring car	$2300
Six-cylinder roadster	$2250
Four-cylinder, six-passenger touring car	$2050
Four-cylinder, four-passenger touring car	$2000
Four-cylinder roadster	$2000

Write to-day for STURDY STUTZ Catalog B-18

IDEAL MOTOR CAR COMPANY
Manufacturers of Stutz Cars
Indianapolis, Indiana



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Sign of the bright red tag

¶ On the bench of each inspector is a rack full of crimson tags.

¶ Danger signals to be tied on every piece not made *exactly* to specifications; warning tags to insure that no imperfect parts shall enter the finished bearing.

Timken Tapered  Roller Bearing

¶ Here's a red-tagged 'cup' marked 'small O. D.'—date—name (Griffin) of the man who ground it. An inspector (Will Keyser) has found it to be half the thousandth part of an inch too small in outside diameter.

¶ So he tagged it red and sent it along, with other tagged parts, to the 'morgue.'

¶ 'Morgue' is the name Timken shop men give to the place where rejected parts go. It's the morgue man's task to break up those parts so they never can come, by possible chance, into use in the Timken Bearing.

¶ Twelve operations make the part called the 'cone.' Twelve inspections are given to *know* each dimension, each angle, is right. Let the slightest error occur at any step of the way—an inspector will spot it and—tie on the red tag quick!

¶ Long before such care was used, the Timken principle of tapered rollers revolving between a tapered cup and a tapered, two-ribbed cone gave a unique type of bearing that won marked success over all other kinds.

¶ In the years that have followed, Timken care *in every detail* of the making has added a hidden value that's only revealed in a life-time of good service.

The Timken Roller Bearing Company

Canton, Ohio, U. S. A.

The only axle manufacturer (except [illegible]) to make automobile axles equipped with Timken Roller bearings is the [illegible] Axle Company

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1913 Motorcycle Shows

and what the Bicycling World and Motorcycle Review will do in connection with them.

New York Show

will be held in connection with the Automobile Board of Trade Annual Show in Grand Central Palace, under auspices of the Motorcycle Manufacturers' Association

January 11-18

We will publish two big issues in connection with this show.

New York Forecast Number
January 7

New York Report Number
January 14

The Chicago Show

will be held at the Manufacturers' Exhibition Bldg., 1319 Michigan Avenue, and will be conducted under the auspices of the Motorcycle Manufacturers' Association

February 3-8

Two special issues will be published descriptive of this show.

Chicago Forecast Number
February 4

Chicago Report Number
February 11

We are ready now to book reservations of space for all or any of the four above described numbers of **THE BICYCLING WORLD AND MOTORCYCLE REVIEW**, and our service department is now preparing copy and sketches for our advertisers' use in these big issues. Each of the Show Numbers will have extra circulation without increase in price of space and our regular advertisers may use extra space on their contracts at minimum rates. This is a splendid opportunity of which the entire trade should take advantage.

Copy and cuts can be handled one week in advance of each publication date, but we recommend reservation now and an early preparation of copy. Can we help you with this copy? And how much space can we reserve?

BICYCLING WORLD AND MOTORCYCLE REVIEW
1600 Broadway **New York**

New York *and* Chicago

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Yes they can be broken

BUT NO BLOW IN ACTUAL SERVICE CAN DO IT

SHELDON

STEEL WHEELS



Here is a wheel that weighs less than the wooden wheel, that is positively unbreakable and that will outlast the best twenty cars that ever were manufactured.

The Sheldon steel wheel is the result of years of study of the wheel problem, the concentration of expert effort on improved design, and the most economic methods of construction known to the industry. It is unbreakable under conditions that would smash a wooden wheel to fragments and make a wire wheel unfit for anything but junk. The superior resiliency of the Sheldon steel wheel adds another advantage which the car owner or car manufacturer cannot overlook—tire economy.

This tire economy results from the light weight at the wheel's periphery and the rapidity with which frictional heat radiates from the metal. These are scientific facts which cannot be contradicted and should not be overlooked by any car manufacturer.

The stamp of superiority which has always rested on Sheldon Axles has been put upon the Sheldon steel wheel, which means that no wheel could be better made in any factory.



SHELDON AXLE CO.

WILKES-BARRE PA.



Men Will Want
These Things This Year in a "40"

Mark all the features listed below this cut.

Note the four forward speeds, the over-wide tires, the center control, the left side drive.

Note the electric lights, the 14-inch cushions, the roomy, 22-coated body, the 50-inch rear seat.

Note the big springs, the big brakes, the immense over-capacity.

And note the price at which these things are given. Does any Forty you know make a comparable offer?

All Men Will Know

Our dominant advertising, all the time, keeps all these facts before motor car buyers.

They are bound to know—just as you know—that no other car in this class makes an equal offer at the Michigan price.

It's a Cameron Car

This is not the product of an obscure engineer. It is built by W. H. Cameron, a man whose work is known the world over—who has built 100,000 successful cars.

The body is designed by John A. Campbell, whose body designs have been chosen by kings.

The concern back of the Michigan is one of the largest and strongest of its kind. And we waited four years to perfect this car before we came out in the limelight.

Scores of the ablest men have given their best to it. And 5,000 Michigans have been put on the road to test their 300 improvements.

The final result—the latest Michigan model—is one of the greatest cars of the day.

World-Wide Fame

The car has jumped, in the past four months, into almost world-wide fame.

Experts have come here from 11 foreign countries. They have selected the Michigan to compete in Europe with the finest foreign cars.

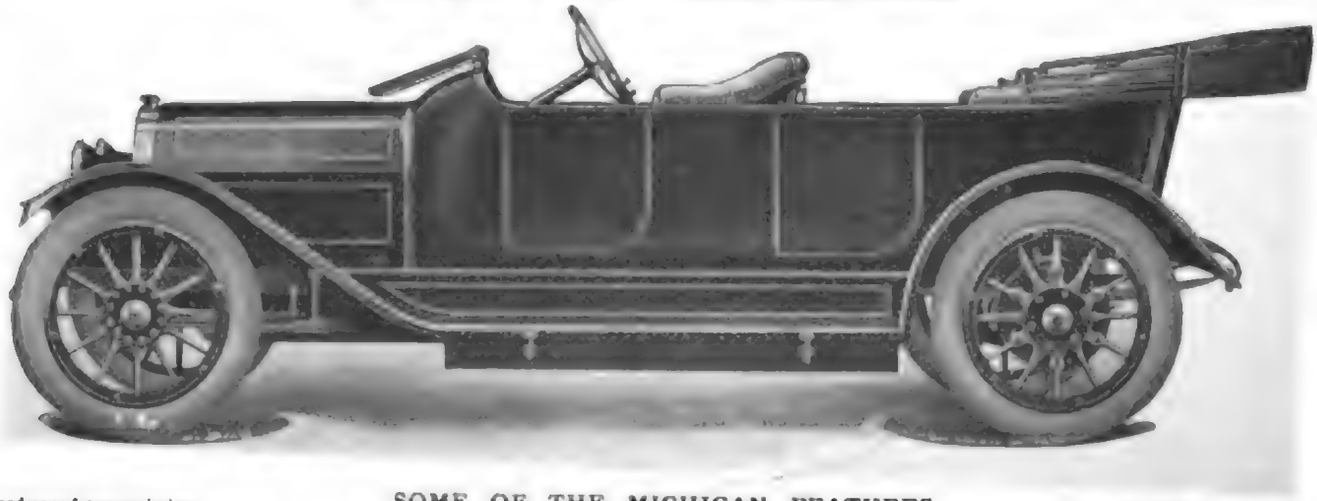
Hundreds of American dealers, who know the whole market, have chosen the Michigan as the greatest car in its class.

Such a verdict can't be avoided by any man who knows the facts.

We invite dealers and users to send for our catalog and the facts which they wish to know.
(139)

MICHIGAN MOTOR CAR COMPANY, Kalamazoo, Michigan

Owned by the Owners of the Michigan Buggy Company



Four-forward-speed transmission
Oversize tires—35 x 4½
Electric lights and dynamo
Center control—left-side drive
Motor, 4¼ x 5¼
Extra effective brakes—16 x 2½ ins.
Big, comfortable springs
Adjustable steering post
Adjustable pedals
Firestone Q. D. demountable rims—extra rim

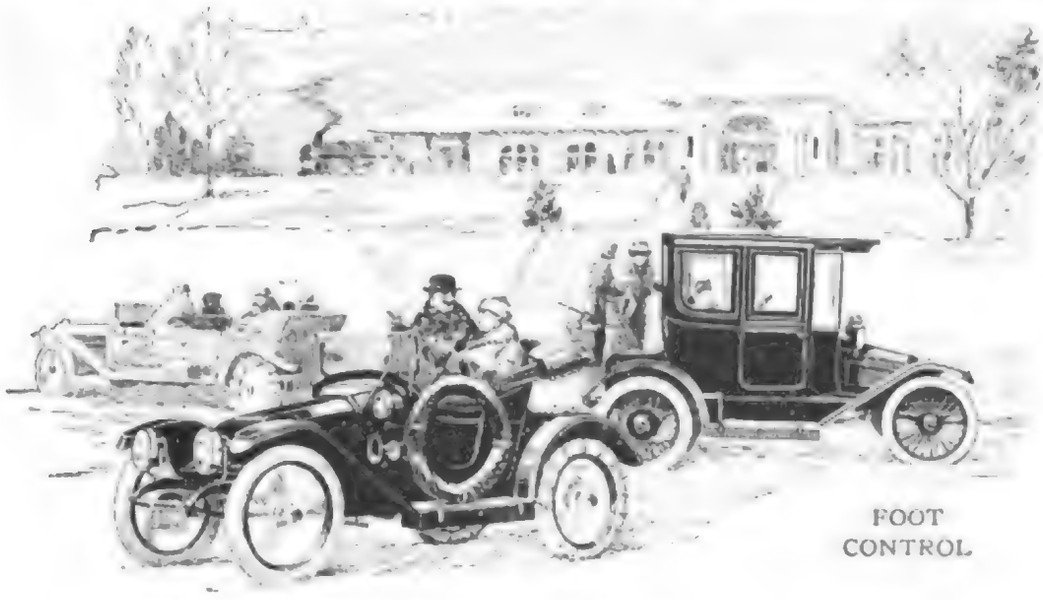
SOME OF THE MICHIGAN FEATURES

14-inch Turkish cushions
Rear cushions 50 inches long
Hand-buffed leather upholstering
Best curled-hair filling
Wheel base, 118 inches
Nickel mountings
Large over-capacity, giving big factors of safety
Pressed steel, full-floating rear axle
Axles sufficient for an 80-horsepower car
Genuine cellular-type radiator
Best mohair top, side curtains and envelope
Windshield built in as part of body
Electric horn
$50 speedometer, 4-inch dial
Special foot rail
Swing robe rail

Rear tire irons
Complete tool equipment
Tool chests under running boards

There is such a difference of opinion about the various types of self-starters that we have not adopted any one type as regular equipment. We prefer to leave this selection to the buyer. We equip with either the gas or a positively efficient electric starter at moderate extra price.

Buffalo Electrics



FOOT CONTROL

THE action of walking is so natural you never give a thought to how it is done, although, to start, you raise one foot—to stop, you place both feet on the ground. Just as simply and unconsciously the owner of a Buffalo Electric controls the starting, stopping and speed of his car—all by the foot control—an exclusive Buffalo Electric feature. You do not walk with your hands—why start, go slowly, fast or stop a car in an unnatural manner. Foot control on Buffalo Electrics is the natural control.

Raising the foot pedal releases the brakes and applies the power—depressing the pedal shuts off the power and applies the brakes.

In driving thru congested traffic, even in case of danger of collision, your first impulse is to brace down with your foot and, to your joy, if you drive a Buffalo Electric, you find this involuntary action compels the car to respond almost as to a wish. Your hands meanwhile are free to guide the car; either or both employed for the purpose, as you desire.

Besides the factor of safety, Buffalo Electric foot control means greater battery economy.

MODEL 29—2 Passenger Roadster—35 miles an hour under ordinary conditions. Wheel steer, wood or wire wheels, Klaxonette warning signal, full floating rear axle—Timken Bearings.

MODEL 30—4 Passenger Vis-a-Vis Coupe—30 miles an hour. Full day's service on single charge. Highest type equipment for ideal town car.

MODEL 30B—4 or 5 Passenger forward drive Coupe. Wood or wire wheels, French body design. All Buffalo Electrics have foot control, caster steering, shaft drive, aluminum bodies and extra capacity batteries.

BUFFALO ELECTRIC VEHICLE CO.

Factory and General Offices:

1222 Main Street, BUFFALO, N. Y.

DEALERS:—The Buffalo Electric line for 1913 offers the best nucleus for a profitable motor sales proposition. Correspondence with reliable dealers regarding terms and territory is solicited.

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"Let the Lamp of Experience Light Your Way"

Some Shining Lights "57 Varieties" in the Electric Field who use F&S Ball Bearings

The Dependable Kind—
Made in Germany

Westinghouse	General Electric
Gray & Davis	Otis Elevator Co.
Wagner Electric Co.	Taft-Pierce Mfg. Co.
Pyle N. E. Headlight Co.	Michigan Magneto Co.
Crocker-Wheeler Co.	Regina Co
Robbins & Myers Co.	Triumph Electric Co.
Kinetic Eng. Co.	Schroeder Headlight Co.
Spencer Turbine Co.	Esterline Co.
Apple Electric Co.	Bicalky Fan Co.
Okey Mfg. Co.	Pneumelectric M. Co.
Electro L. & S. Co.	Dyneto Electric Co.
Kokomo Electric Co.	Eck Dynamo & Motor Co.

Astoria L., H. & P. Co.

Rauch & Lang Carriage Co.	Woods Motor Vehicle Co.
Baker Motor Vehicle Co.	Studebaker Corporation
Columbus Buggy Co.	Waverly Co.
Walker Vehicle Co.	Standard Electric Car Co.
Clark Motor Car Co.	Borland-Grannis Co.
Dayton Motor Car Co.	Argo Electric Vehicle Co.
Grinnell Electric Car Co.	Colonial Electric Car Co.
J. G. Phipps E. Car Co.	Broc Electric Vehicle Co.
Iowa W. & P. Co.	Century E. M. Co.
Washington M. V. Co.	Joliet Auto Truck
H. McFarlane & Co.	Cleveland Motor Truck
Bryce Baking Co.	H. H. Babcock Co.
M & P Electric Vehicle Co.	Lansing W. Co.
Battendorf Axle Co.	Chas. K. Davis
Champion Wagon Co.	Atterbury M. Car Co.
Bijur Motor L. Co.	Atlantic Vehicle Co.

BRETZ COMPANY
Sole Distributors of F & S Ball Bearings
136 West Fifty-fourth, New York



Maximum Carrying Capacity
Minimum First Cost
Minimum Maintenance
Minimum Turning Radius

What It Is

Not a Theory But a Proven Success in a Year's Gruelling Work. Many in Successful Operation. 5 to 10 Ton Capacity. Full Details Explained in Tractor Catalog. Send Today.

A motor unit that may be attached to any heavy vehicle designed to be drawn by horses; the combination making a five-wheeled motor-drawn vehicle.

IT SAVES HEAVY MAINTENANCE CHARGES DUE TO EXCESSIVE COST OF RUBBER TIRES. Wagons have been doing good work for many years on steel tires and there is no reason why they will not continue to do so when drawn by the tractor; the heaviest part of the load is always carried on steel tires.

IT SAVES HEAVY MAINTENANCE CHARGES DUE TO EXCESSIVE VIBRATION ON STIFF SPRINGS. All working parts of the tractor are carried on springs as resilient as those of a pleasure car.

IT SAVES HEAVY MAINTENANCE CHARGES DUE TO SUDDEN STARTING OR STOPPING OF HEAVY LOADS. The cushioning of the shock between the engine and the load is one of the most important advantages gained, (fully explained in catalog).

IT SAVES HEAVY MAINTENANCE CHARGES DUE TO NEGLECT ON ACCOUNT OF INACCESSIBILITY OF PARTS—all parts of the tractor being more accessible than on a touring car.

IT SAVES HEAVY MAINTENANCE CHARGES due to frame twist. The tractor accommodates itself to all road unevenness.

The single front wheel can be turned at 80 degrees angle, enabling the driver to back to any position or turn completely around in a narrow street.

Send for further information and prices

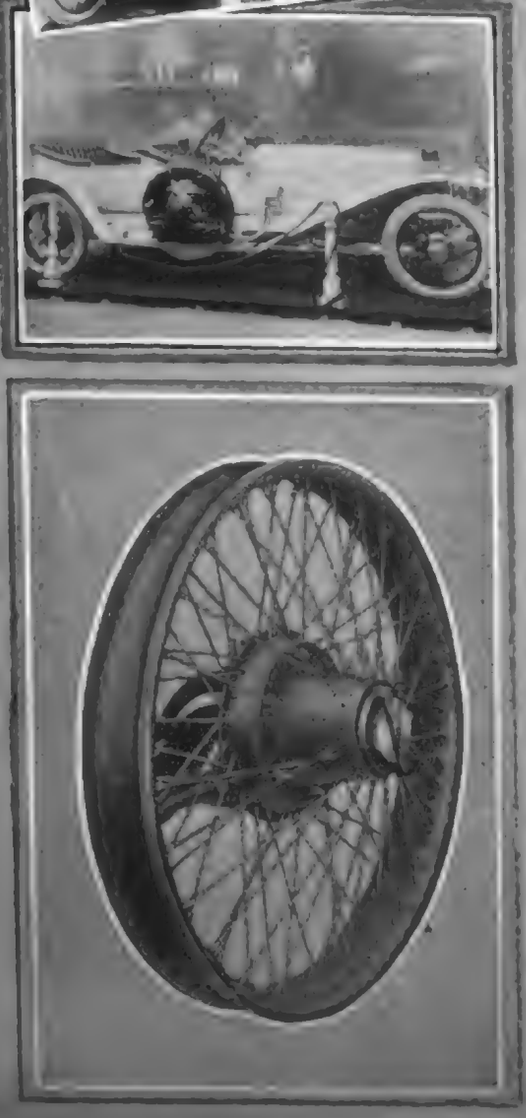
KNOX AUTOMOBILE COMPANY (Tractor Department) Springfield, Mass.

BRANCHES—New York, Chicago

AGENTS—The Knox Martin Tractor Is the Greatest Proposition in the Commercial Field Today. Fully Protected by Patents.

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McCUE

Three prominent wire wheel equipped cars at the French Salon shown on this page—Leon Bollee, Barre, and Rolls-Royce.

DEALERS—MANUFACTURERS

We want to emphasize the real reason for wire wheels—we want you to consider it, and act upon it.

Wire wheels save tires, not theoretically, through some abstruse, far-fetched theorem, but **actually up to a percentage that goes above fifty of added tire usefulness.**

Rapid radiation of frictional heat is one reason—but not the most vital, save in cases where abnormal speed conditions obtain. Then, metallic radiation of frictional heat is an important consideration.

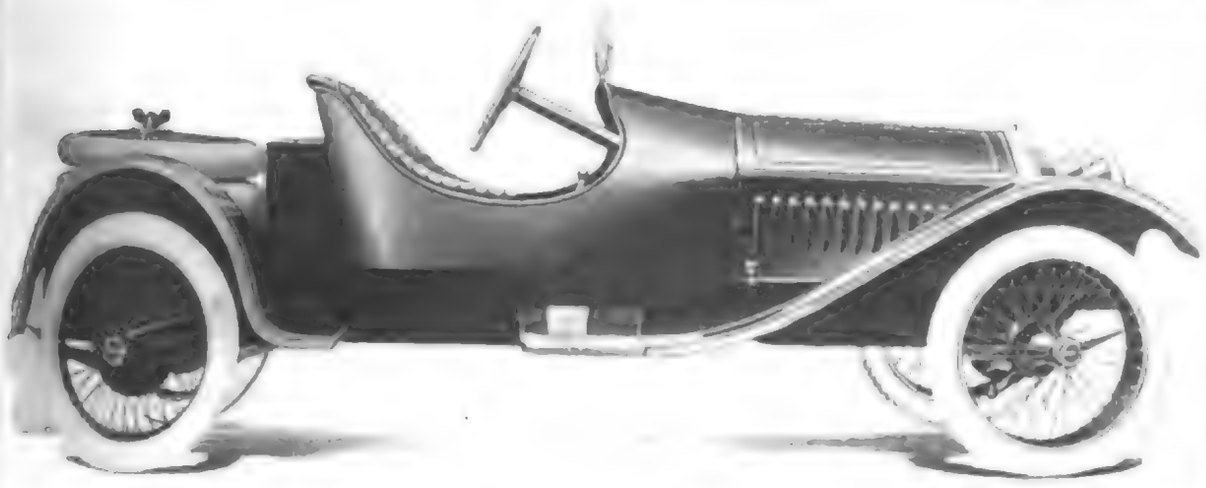
Under ordinary every-day conditions, it is the extreme lightness of the McCue Wire Wheel at its periphery, that reduces to a minimum the pounding effect at point of contact. This tells its own story of tire economy.

Here is the illustration:

You can strike a terrific blow with a ten pound hammer if you grasp it by the handle—but you can't do execution if you grasp it by the head and use the end of the handle as the striking point. The "hammer head" of the McCue Wire Wheel is the hub—the light end of the "handle" is the rim.

The economic disposition of metal in this wheel is arbitrary—it can't be changed without sending tire life down toward the accepted wooden wheel standard. For this reason demountable rims would never serve—they would add weight at the periphery, and every added pound counts wrong—

WIRE WHEELS & AXLES



Oakland Roadster, Wire Wheel Equipped

Explaining why McCue Wire Wheels are detachable—a pre-determined engineering feature with the tire saving quality in mind.

The McCue Wire Wheel is the final evolution of the burden carrying wheel. It can not be improved.

When you specify these wheels you are taking advantage of a selling point that will soon dominate—you are going on record as one who is helping the car owner save money—and so you conserve his patronage.

Looking into the immediate future, your best business interests will be conserved if you beat competition to this radical improvement—because it will surely dominate the field—and soon.

Isn't it worth while?

McCue axles represent the best in axle making, clear from design, through material and into the finished product.

If your customers want wire wheels, you write the manufacturer for inner hubs and wire wheels to go on the particular model to be so equipped. We are situated so that we can meet this demand for the manufacturer.

THE McCUE COMPANY, Buffalo, N. Y.

It is important to note that all spokes used in the manufacture of McCue Wire Wheels are the famous "Circle S" brand of swaged spokes manufactured by The Standard Company of Torrington, Conn.

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The Atwater Kent Ignition System

DEALERS and REPAIRMEN

HERE are a few good Atwater Kent "talking points." You can make them make you money.

Its simplicity of mechanism—no vibrators, relays, or commutator—just one contact point regardless of the number of cylinders and only three moving parts, none of which are subjected to excessive wear.

Its single adjustment easily and quickly made and seldom requiring attention.

Its adaptability and easy installation on any standard make of motor, new or old.

It is ideal for use in connection with lighting and starting equipment as it produces a hot dynamic spark, perfectly timed regardless of the engine speed.

While the Atwater Kent System is high in value and reputation, it is not high in price. In fact, it will cost less than half as much as a good magneto and will give superior results at a much less cost of upkeep.





There are now two types of Atwater Kent Ignition equipment—standard **Type F** and the new **Type K,** the latter having the automatic spark control and insulated primary circuit features.

PRICES OF THE TYPE F SYSTEM

	Standard Coil.	Kick Switch Coil.
1-cylinder	$17.00	
2-cylinder opposed	18.00	
2-cylinder distributor type	22.00	$24.00
3-cylinder distributor type	25.00	27.00
4-cylinder distributor type	25.00	27.00
6-cylinder distributor type	27.00	29.00

PRICES OF THE TYPE K SYSTEM

	Standard Coil.	Kick Switch Coil.
2-cylinder	$32.00	$35.00
3-cylinder	35.00	38.00
4-cylinder	35.00	38.00
6-cylinder	37.00	40.00

In substituting the Atwater Kent System for the magneto or for driving it from any horizontal shaft or gear, we furnish a special magneto gear mounting, the additional price of which is $5.00.

You will have many inquiries for ignition equipment during the coming year and should be in a position to recommend the Atwater Kent whenever the most efficient ignition is desired.

Seize the opportunity and post yourself by a visit to our exhibit No. 140 Madison Square Garden Show, New York City, or write for our booklet "D."

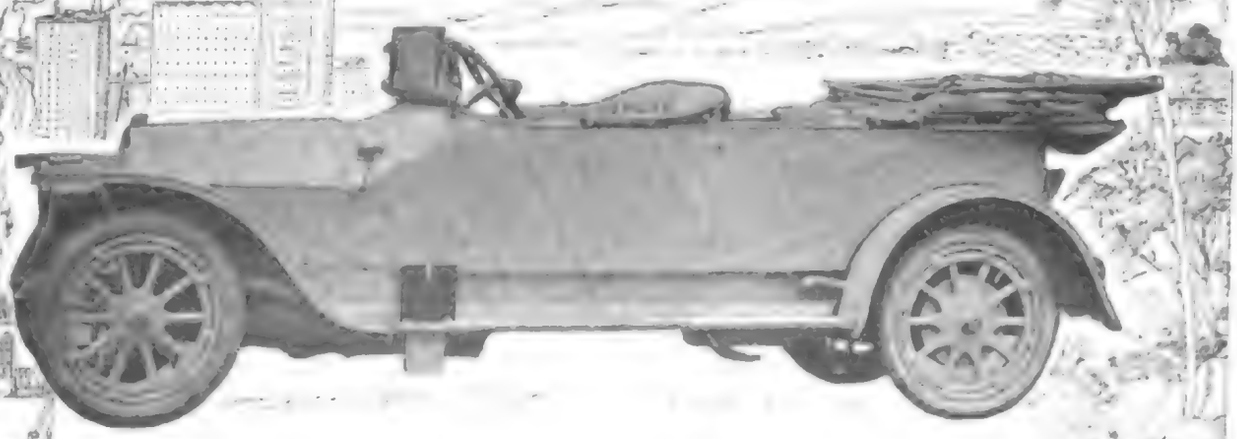
ATWATER KENT MFG. WORKS

4934 Stenton Ave. Philadelphia, Pa.

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Lancia Cars

"They copied all they could follow,
But they could'nt copy my mind,
And I left 'em sweating and stealing
A year and a half behind."
— Kipling



DEALERS You Can Sell This Car

"The Best of Europe At American Prices"

The Lancia propaganda has taken root and is growing in America—and the reason is mighty obvious.

There is a class, Mr. Dealer, and a restricted one at that, who understands, appreciates and buys this peer of light European cars—(we will send you the names on request).

And there are those in ***your*** territory to whom its combination of strength, efficiency, simplicity and design will appeal.

The Lancia is the best of Europe at American prices—meaning that the purchaser of a Lancia car does not have an extravagantly priced European novelty of freak design—

But a ***real service*** car from Europe—a masterpiece of European design, steel and finish—made and tested in the Alps under the personal supervision of Vincenzo Lancia himself—with a guaranteed value, pound for pound, dollar for dollar greater than that offered by any American or European manufacturer.

Do you want to sell a car of class, service and beautiful design to the fastidious and critical? If you do, then come to New York if possible—see and know the Lancia—or write and let us give you details of the "20" and "30" mounted with coach work in keeping with the chassis.

For Town

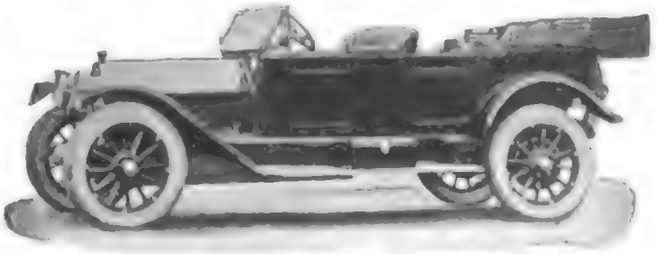
For Country

ADAMS LANCIA COMPANY

235 West 38th Street **NEW YORK, N. Y.**

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"Service and Silence"



Kline Kar Model 6-60, Touring, $3500

DEALERS

YOUR experience with other cars should tell you that it does not pay to handle a line that constantly worries the life out of you with complaints from the user, who has trouble with the machine. This user knows now that he is better off when he buys a car of quality in the first place, even though he must pay a little more for it, and he will soon begin to demand such a car of his dealer.

It is up to you to have the car in your line when he calls. The Kline Kar will answer all the requirements this prospect may impose and more.

Prices $1850 to $3500
(Fully Equipped)

Get Our Proposition

Kline Motor Car Corporation
YORK, PA. RICHMOND, VA.

EISEMANN

Automatic Spark Control
INCREASES TRUCK EFFICIENCY

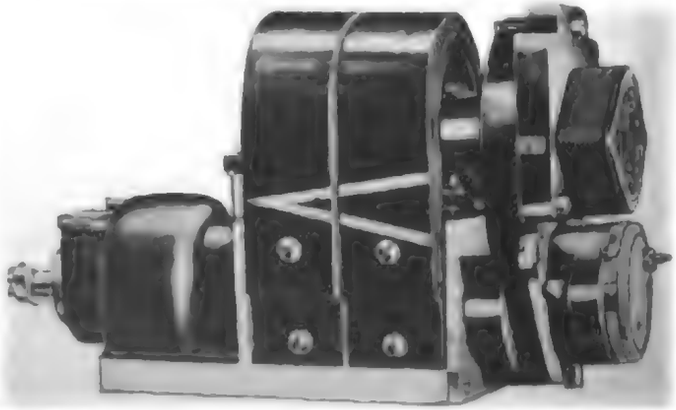
No type of magneto is so peculiarly adapted to the demands of commercial vehicles as the Eisemann models equipped with **Automatic Spark Control.**

By making the advancing and retarding of the magneto an automatic function based, as it should be, on relative engine speeds, the Eisemann Company has provided an ignition system especially adapted to trucks that insures the greatest continuous engine efficiency obtainable.

Eisemann Magnetos with **Automatic Spark Control,** by removing the guesswork necessarily present when magneto timing is a human element, simply force the engine to develop maximum efficiency insofar as ignition is concerned, irrespective of engine speed. For with the spark controlled automatically in relation to engine speed the engine is bound to get its spark at exactly that moment which will give maximum results.

The story of the magneto with **Automatic Spark Control** is a mighty interesting one—let us tell it to you.

THE EISEMANN MAGNETO CO.
Sales and General Offices:
225-227 West 57th Street
Indianapolis, 514 North Capitol Ave. Detroit, 802 Woodward Ave.



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Acme Parts Stand Expert Inspection

Accessory parts in many cases are for display as well as practical purposes. They require a smooth finish and must be accurate.

The reputation for quality that NAMCO products have gained is the result of careful study of trade requirements. To maintain that standard for 1913, NAMCO parts must stand rigid inspection—first in our factory and then in yours.

Our operators know the measure of quality set by us in making milled parts. They turn out the kind of product that measures up to the inspectors' gauges. That's the kind you want, and the kind we sell you.

Tell us your specifications, or send in your samples for estimate. If you have not seen our "Special Milled Products" book, ask us for it when sending in your samples. For lists of standard goods, ask us to send booklet "Milled Screws."

The National-Acme Manufacturing Company

CLEVELAND "SIXTH CITY"

New York Chicago Boston Detroit Montreal

SPECIAL MILLED PRODUCT

The Largest Automobile Supply House in America

WE WILL EXHIBIT

at the

AUTOMOBILE AND MOTOR BOAT SHOWS

We are now collecting data for our 1913 Annual Catalog, which will contain 256 or more pages and will have a circulation of not less than 100,000 copies throughout the world.

Manufacturers of ACCESSORIES, who are making Parts, Fittings and Sundries for use on Automobiles, Motor Boats, Motorcycles or Aeroplanes, are requested to send us catalogs or circulars and make us a proposition regarding cataloging and handling their material, and, in quoting us, please take into consideration the fact that we have **Fourteen Branch Stores** and quote our prices F. O. B. Each Branch.

Catalog Mailed to Anyone on Request

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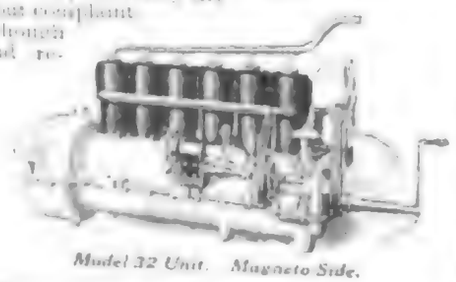
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So does your customer.

Imitations are getting harder and harder to sell. There are now mighty few dealers trying it.

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"The sooner you resume earning your good old Prest-O-Lite profit, the sooner you will make your income what it used to be."

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Branch Offices and Service Stations in all principal cities.
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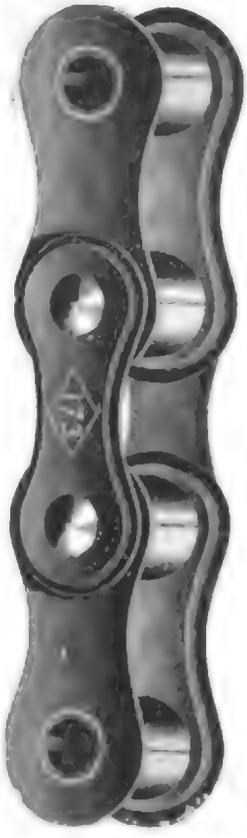
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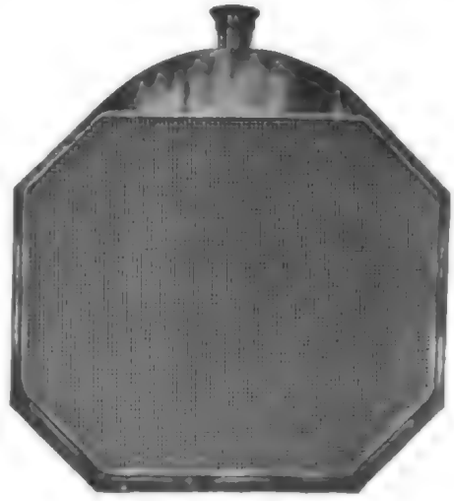
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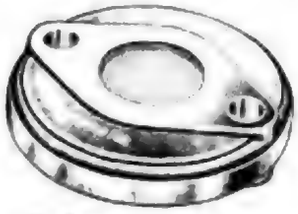
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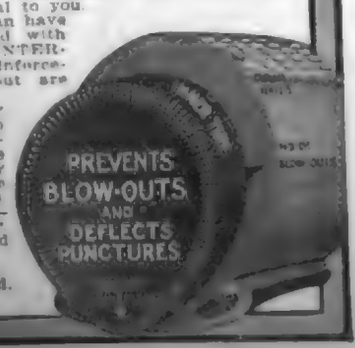
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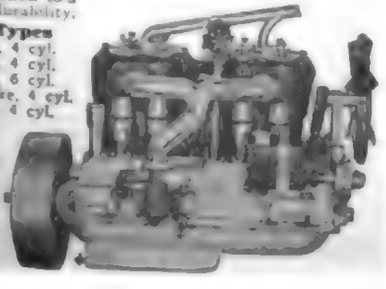
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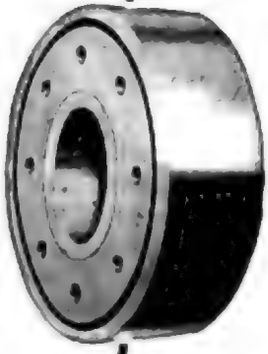
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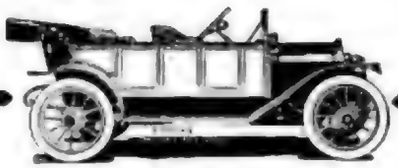
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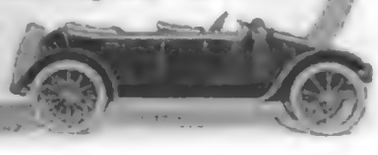
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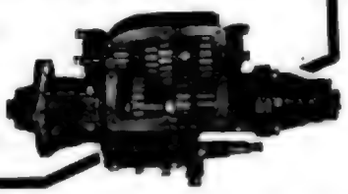
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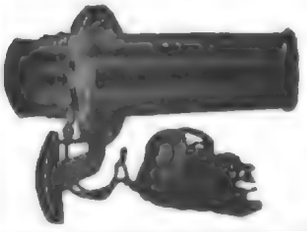
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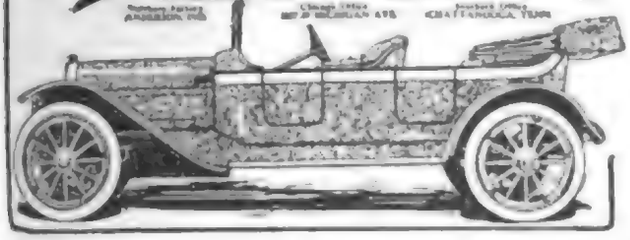
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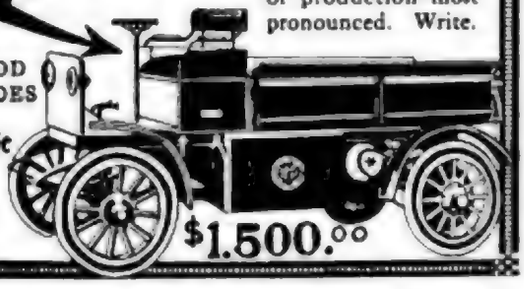
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DEALERS—Here is the first electric truck that sells for about $700 less than any other. Capacity 1000 pounds—Service 100 per cent. more than gasoline truck—Economy of production most pronounced. Write.

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The Marmon "32"

32-40 h. p., 120-inch wheelbase, dependable electric starting and lighting system, left-hand drive, center control, nickel trimmings, with newest body types to meet every requirement and corresponding equipment—

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THE UNIVERSAL CAR

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Long-stroke motor, 3¼ x 5½ inches. Enclosed valves. Three bearing crank shaft. Unit power plant. Multiple Disc clutch. Three speeds forward. Sliding gears. Full floating axle. Center control. Zenith carbureter. Bosch magneto. 106-inch wheelbase. 32 x 3½ inch tires. Quick detachable rims. Mohair top with envelope. Jiffy curtains. Windshield. Rear shock absorber. Prest-O-Lite tank. Gas headlights. Oil side and tail lamps. Tools—horn. Trimmings, black and enamel. Standard color, black. Magneto and camshaft driven by silent Coventry chain.

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Chassis and specifications same as Touring Car. Large turtle back dust proof compartment for extra accessories, tires and baggage.

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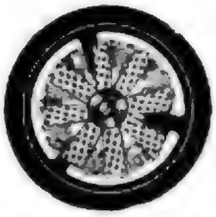


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Model 11, Broward-Seven Brougham for five passengers, wheel or lever steer. Model 25, Four-passenger Brougham pedestal front seats. Model 36, Five-passenger Brougham. Model 70 Stanhope. Model 71 Victoria.

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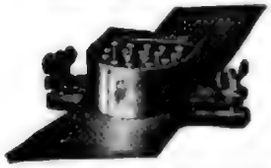


fit any style or make of tires. The side rings are reversible, they curve outward on one side to fit a straight side tire, inward on the other to accommodate a clincher. Two turns of a nut unlocks the rim for demounting, two more turns locks the rim in place. Write for catalog 607, which explains fully.



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You can repair CASINGS and INNER TUBES anywhere in 15 minutes, better than a Repair Shop can do—and for *one cent*.

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Auto-Vulcanizer
Patented

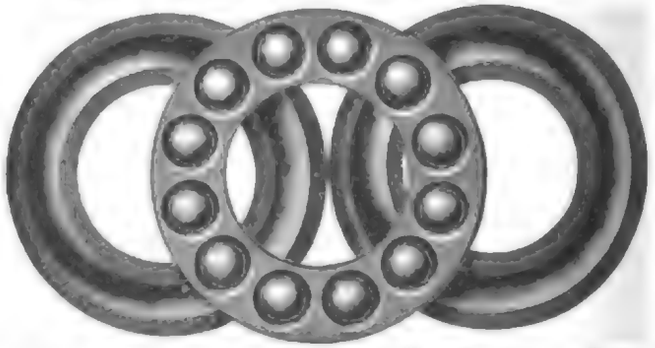
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Absolutely automatic. Place the patch—attach the Vulcanizer—put in the gasoline—light it. No further attention required. In 15 minutes the job is done.

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NEW POSITIVE LOCK STOP
TWITCHELL AIR GAUGE



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The first American Car to adopt the Silent Knight Motor—the engine used by Daimler, Mercedes, Panhard and Minerva.

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Touring Car and Roadster Types. 44 h.p. 6 Cylinders. Unit Power Plant, 3-Point Suspension. 122 in. Wheel-Base. 36 x 4 Tires.

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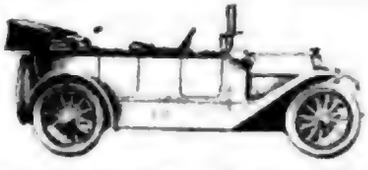
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"THE MASTER CAR" FIFTEENTH YEAR

6 Cyl. 50 H. P., $5,000 4 Cyl. 55 H. P., $4,500

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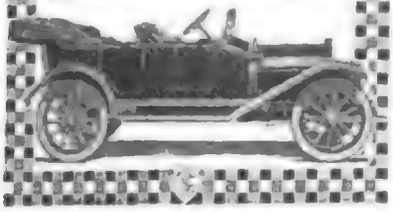
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The worth of a tire is measured in miles. That's why it's easy to measure the worth of Kelly-Springfield Tires—with their mileage averaging a thousand or two better than the average mileage of the average tire.

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4 and 6 cylinders
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The Continental "Six" is maintaining, on the road at this minute, the good name made by our four cylinder types.

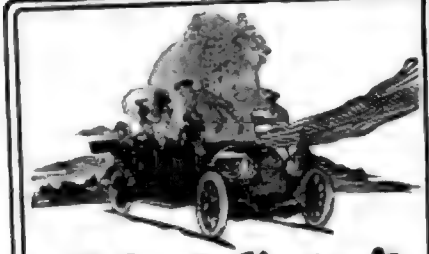
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MODERN AUTO APPLIANCE CO.
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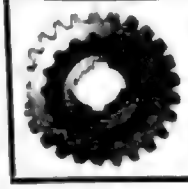
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The Motz Tire and Rubber Co.
Executive Office:
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Service Stations in All Principal Cities

A—Shows double notched treads
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D—Shows absorbing recess when rushing over an obstruction



Tones down headlights for city driving and foggy nights an auto necessity. Price 75c. per pair. Sell like hot cakes. Dealers, secure the agency quick.

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Smooth as Electric, Will replace any engine in any car
No Valves, No Springs
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No Fly Wheel, No Muffler
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SEMPLE S. SCOTT 1651 Marquette Bldg. CHICAGO, ILL.
Exclusive Territory Open for Live Agencies

Look at our new middle name
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PENNSYLVANIA RUBBER COMPANY
Branches: Coast to Coast. Jeannette, Pa.

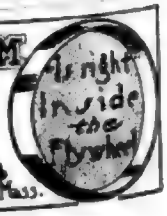
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forces the water from radiator through cylinder water jacket, maintaining rapid circulation when car is in motion. Write for descriptive matter if you handle Ford cars.

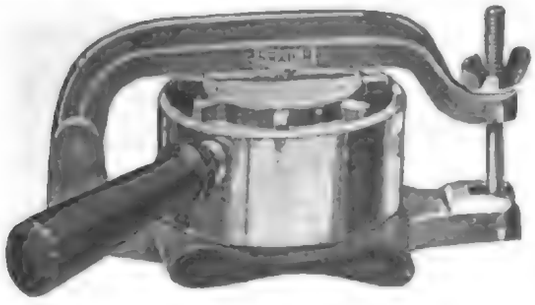
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1146 Michigan Ave. CHICAGO, ILL.

The Otho System for Self Starting Lighting Ignition Signalling



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Something brand new that every motorist needs

A real Shaler Vulcanizer for only two dollars. A vulcanizer that will make tube repairs equal to those made by the most elaborate plant. Anybody can use it on the road or in the garage without experience. Made by the largest vulcanizer manufacturers in this country, by men who know the requirements of such an appliance.

Don't ever use another unreliable cemented patch. Make permanent repairs with the quick-cure

VULCANIZER REPAIR KIT —little brother to the SHALER

The only low priced vulcanizer that actually **vulcanizes** a tube repair clear through because it generates its fuel, gasoline, into a gas and distributes the flame all over the vulcanizing surface. This causes the vulcanizing temperature to be **maintained** long enough to cure the repair. A gradual heating and cooling only results in a superficial cure—does not vulcanize.

Other exclusive features show the only improvements made since the first crude gasoline heated repair kit was marketed. A universal clamping device insures the equal pressure that makes smooth, uniform repairs. An asbestos pad, inlaid in the plate on which tubes are repaired, retains the heat and prevents pinching the tube. Handle—always cool—permits vulcanizer to be removed from tube while hot.

No complication about it. Everything automatic. Simply fill the puncture with raw rubber, clamp down the vulcanizer, fill the generator and light it. The repair will be perfect and outlast the tire.

Eliminates delay and repair bills. Makes your repairs when you want them at a tenth of the expense you've been accustomed to.

Furnished with a supply of repair material and full instructions. Nickel-plated—will last a lifetime.

A Real SHALER VULCANIZER $2

Dealers **Get our 1913 Proposition on the Vul-Kit and other Shaler Vulcanizers for motorists and garages. We have vulcanizers for every requirement.**

C. A. SHALER CO.

400 Tenth Street **Waupun, Wis.**

Manufacturers of the Only Complete Line of Vulcanizers in the World

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For Sale—Wants—Exchange

15 cents per line of six words, cash with order; — In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

OR SALE OR TRADE—Farm of 120 acres, good black loam, well located on ne roads, all in cultivation; will exchange garage in Ill. or Ind. What have you? E. BROOKS, 427 W. Marietta, Decatur,

'OR SALE—1908 Winton touring car, 7-passenger, good running order, fully uipped; price $400. Address BOX 230, otor World.

'OR SALE—1,000-pound truck, 20 H.P. Solid tires; good repair; 1911 model. ANSEN & JOOSTEN, Flanagan, Ill.

KEROSENE FOR AUTOMOBILES. New Model B uses successfully half and alf mixture lowest grades kerosene and asolene. Satisfaction guaranteed or money efunded. Greatly increased power, very low speed on high. Starts easy at zero. pecial agents' prices. Dept. 8. THE AIR-FRICTION CARBURETOR CO., layton, Ohio.

FORD spare wheel—saves tire worry. Doctors use it. Easy to install. Write. ANGIER'S, Streator, Ill.

MANUFACTURING PLANT FOR SALE THE LARGE FACTORY OF THE CORTLAND WAGON CO., LOCATED AT CORTLAND, N. Y., CAN BE BOUGHT ON EASY TERMS FOR ONE-THIRD ITS ACTUAL VALUE. THE PLANT COMPRISES EIGHT ACRES OF GROUND IN THE CENTRAL PART OF THE CITY, AND LACKAWANNA AND LEHIGH TRACKS RUN ALONGSIDE EVERY BUILDING. THE BUILDINGS ARE OF BRICK AND CONTAIN ABOUT FOUR ACRES OF FLOOR SPACE AND ARE ALL EQUIPPED WITH SPRINKLER SYSTEM, ELECTRIC LIGHT, STEAM HEAT, ETC. THE WHOLE PLANT IS IN FIRST CLASS CONDITION WITH STEAM IN THE BOILERS AND IS READY FOR IMMEDIATE OPERATION. IT IS ESPECIALLY ADAPTED TO THE MANUFACTURE OF AUTOMOBILES AND ACCESSORIES AND IN ABUNDANCE OF SKILLED LABOR CAN BE OBTAINED IN THE VICINITY. IF INTERESTED, PLEASE COMMUNICATE WITH D. W. VAN OESEN, CORTLAND, N. Y.

ICTORIA TOPS AND SEAT COVERS That's our specialty, but we make a full e as well. Any style and every one the st that high-grade materials and expericed workmen can make. Prompt service ured. We're glad to estimate special rk or quote you prices on stock tops. NTRAL AUTO TOP CO., Indianapolis, I.

OR SALE—Cheap—one 1913 Studebaker "30" touring car, brand new; one 1911 -passenger Glide, both fully equipped. ress LOCK BOX 75, Vincennes, Ind.

OR SALE—1910 Peerless limousine; newly done up and relined; price $2,000. Land Title Bldg., Philadelphia, Pa.

FORD spare demountable wheel, something new. No tire trouble on road. Write. ANGIER'S, Streator, Ill.

PEERLESS AUTO TOP DRESSING. A waterproof dressing for leaking mohair and duck tops and curtains. Makes old and faded tops look like new. Ask your garage and supply dealer for it.
The Columbus Varnish Co., Columbus, O.

SURPLUS STOCK BOUGHT
Cars, Bodies, Tops, Tires, etc.
Cash transactions. Quick business.
20TH CENTURY CO., 1700 B'way, N. Y. C.

1909 Haynes 7-passenger car, magneto, fully equipped, electric light, Newtone horn, etc., $500. Would trade for automobile supplies or small runabout. 1507 Bushwick Ave., Brooklyn, N. Y.

N. E. AUTO LIST AND TOURIST. Includes weekly list of all N. E. Auto Owners, Garages, Dealers, etc., with maps and selected N. E. routes, $10.00 yearly. 138 Pearl St., Boston.

1913 Packard. Will dispose of my new 1913 6-cylinder, 7-passenger touring car at a bargain if taken immediately. Address H. M. WALLIS, JR., Racine, Wis.

PEERLESS LEATHER TOP DRESSING
An oil preparation that softens the leather and pantasote. Makes old tops look like new. Ask your garage and supply dealer for it.
The Columbus Varnish Co., Columbus, O.

SCORED CYLINDERS repaired, $12. No enlargement of bore—no need for new pistons and rings. Send piston with cylinder. Absolutely reliable method. References, testimonials, and full details on request. WATERBURY WELDING CO., Waterbury, Conn.

PEERLESS EXTRA FINE BLACK BAKING JAPAN.
Bakes either to a high gloss finish, eggshell gloss or dull finish on lamps, radiators and fenders. Will not crack, chip or peel. Ask your garage and supply dealer.
The Columbus Varnish Co., Columbus, O.

FOR SALE OR EXCHANGE—Several good used motorcycles. WOLKE CYCLE COMPANY, Louisville, Ky.



An ad. like this will cost you $1.35 for each insertion.

These columns offer you an opportunity to appeal to an audience of 8,000 readers whose merchandising taste is being cultivated

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For Sale—Wants—Exchange

15 cents per line of six words cash with order
—In capitals, 25 cents per line—

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

AUTOMOBILE CYLINDERS reground new pistons and rings fitted. Garage air compressors. CAST IRON BRAZING CO., Manchester, N. H.

PARTNER WANTED—Successful owner of two California garages finds that the great growth of his business necessitates the securing of responsible assistance. Is willing to sell interest to active, enthusiastic man of ability, this partner to be either a machinist or competent accountant and buyer. Partner's investment not considered as important as his ability. Unusual opportunity. Address BOX 229, care Motor World.

7-PASSENGER Franklin, 6 cylinders. Cost $4,250. Splendid condition, $1,000. BOND MOTOR CO., 1615 Grand, Kansas City, Mo.

GARAGE, best equipment in State, 46 storage cars, good repair and supply business, best location in Essex County, good agency, long lease, low rent, for sale. $6,000 for stock, machinery, etc. Address P. O. BOX 93, East Orange, N. J.

TWO expert mechanics will call and give estimate to overhaul or adjust car in you own garage. Address E. BELTZ, 2531 Belmont Ave., Bronx.

BROKEN CRANKSHAFTS, cylinders, crankcases, flywheels, gear teeth, pistons, perfectly welded and machined ready to replace. Guaranteed and references. Machinery up to 5 tons welded. ATLAS WELDING WORKS, 74-76-78 Irving St., Rahway, N. J.

N. E. AUTO LIST AND TOURIST. Includes weekly list of all N. E. Auto Owners, Garages, Dealers, etc., with maps, selected N. E. routes and motor news. $10.00 yearly. 138 Pearl St., Boston.

WANTED—A first-class man to take the agency for the latest invention on the market, a rubber cover for automobile handles called Steerease; write for full particulars. Address DEPARTMENT E, GOODYEAR RUBBER HOSE AND PACKING CO., 221 Chestnut St., Philadelphia, Pa.

LOZIER Type H 4-cylinder touring car. Absolutely new. Demountables. Regular guarantee and equipment. Cost, $5,000 Make cash offer. 1012 N. Grand Ave., St. Louis, Mo.

ARE YOU in need of any additional help in any department of your business? Are you out of employment or looking for a better connection? Have you second-hand apparatus of any kind or do you want to buy second-hand material. Have you a factory site for sale or do you want to buy one? If so, use the Want and For Sale column of the Motor World. Seven words to the line, fifteen cents a line. Advertisements can be inserted over a number when it is desired and identity of the advertiser will be kept confidential

PEERLESS BACK AND CUSHION DRESSING.
Softens the leather and will not crack, wash or rub off. Makes old leather look like new. Dries in twenty minutes. Ask your garage or supply dealer.
The Columbus Varnish Co., Columbus, O

GARAGE WITH MACHINE SHOP and living apartments, all through complete equipped and up to date, for rent or for sale, in fast growing town, on main street, on Long Island, 30 miles from New York. Owner going out of the business. Price reasonable. KAPPERTZ, Farmingdale, L. I. Tel. 21 J.

SALESMEN, one who is now visiting automobile trade or owners. Good money made on a very attractive proposition. STURDY MFG. CO., 2637 Michigan Ave., Chicago, Ill.

PEERLESS EXTRA FINE BLACK JAPAN.
Covers solid one coat for enameling lamps, radiators and fenders. No undercoat required. Heat does not affect it. Ask your garage and supply dealer.
The Columbus Varnish Co., Columbus, O.

COLE, Model DD 1912, seven-passenger, fully equipped, top, windshield, speedometer, two extra casings, inner tubes, electric lights, etc. Car has run less than 6,000 miles; good as new. Special reason for selling. Price, $1,100, F. O. B. Indianapolis. Guaranteed as represented. P. O. BOX 596, Indianapolis, Ind.

DRAGON REPAIR PARTS.
We manufacture and keep on hand all repair parts for the Dragon cars. We make a specialty of repairing this machine. PHILADELPHIA MACHINE WORKS, 67 Laurel St., Philadelphia, Pa.

AUTO LISTS, owners, etc., of any State. S. H. CARROLL, JR., Albany, N. Y.

PEERLESS LINING DYE.
Dyes the cloth linings of tops and curtains a black, uniform color, covering up water stains and grease spots. Does not wash off. Ask your garage and supply dealer.
The Columbus Varnish Co., Columbus, O.

THOMAS 60 H.P. motor with clutch, transmission, Bosch high tension magneto, Stromberg carburetor, for sale cheap. Act quick. Big bargain. KAPPERTZ, Farmingdale, L. I. Tel. 21 J.

weekly to the highest degree by our articles on "Wide Awake Merchandising." Look at the cost as shown in the margins.

An ad. like this will cost you 90c. for each insertion.

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DEALERS—
Out of EUROPE Comes The Aristocratic
METALLURGIQUE

The Car You Can Sell to Men of Means and Fine Discrimination

¶ Are you in a position to locate and interest men of means, social standing and ability to recognize a car of impressive individuality, tremendous prestige and sterling performance.

¶ If so, we will use our sales organization to assist you in selling the Metallurgique, Europe's most talked of car and the one most sought after.

¶ This automobile is the product of fifty years steel making near Brussels, the Pittsburgh of Europe. In materials, it stands alone in quality. Its chassis is a revelation in construction that has given it a proven title, "The unbreakable car." In body design it is a model of sensational European originality that causes even the blase New Yorker to turn to admire.

¶ Metallurgique dealers have as sales ammunition a list of owners that reads like the International Social Register. Write for our beautiful brochure—it will introduce us.

METALLURGIQUE MOTOR CO., 1934 Broadway, New York

W. C. & H. N. ALLEN, Proprietors

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FORTY-EIGHT

DIFFERENT MAKES OF CARS ARE NOW KLAXON-EQUIPPED

An Editorial from MOTOR WORLD:—

As Regular Equipment:

A. E. C.
Alco
Armleder
Autocar
Babcock Electric Roadster
H. H. Babcock
Bailey
Benz
Borland Electric
Broc Electric
Charon *
Columbia
Chicago Electric
Davis
F.I.A.T.
Flanders
King
Knickerbocker
Knox
Lancia *
Lozier
Marmon
Matheson
Metallurgique

ACCESSORIES THAT ASSIST CAR SALES.

Although the time never may come when the accessories that constitute the equipment of a car will of themselves sell cars, the fact remains that the item of equipment now is being made so much of, that he who does not turn it to advantage is permitting good "ammunition" to go to waste.

In many cases, the names of many of the devices which go to make up the equipment list are better known than the names of the cars themselves. Nor is it difficult to understand why a particular accessory should have become better known than the name of the car upon which it is mounted. The manufacturer of the device has widely advertised it and built up a reputation, and because it is a good device the manufacturer of the car and the dealer also advertise it—if they are wise—for they realize that in linking the name of a well-known and well-tried product with the name of their car a certain prestige thereby is added to the car. The automobile buying public has come to know that certain accessories have made names for themselves and it is but a step further to attach real importance to a car that carries one or more meritorious devices.

Horns and lamps and electric lighting systems and starters and a hundred and one other items of equipment which not so very long ago were listed as "extras"—all these serve as cases in point.

With but one or two exceptions—this list includes every high-grade car.

Michigan Electric
Multiplex
Nance
National
Oakland
Oldsmobile
Orson
Pope Hartford
Pierce-Arrow
Pratt
Schneider *
Simplex
Staver
Stearns
Sternberg
Stevens-Duryea
Stoddard-Dayton
Guy Vaughn
Walker Electric
Ward
White

As Special Equipment:

Cole
Hudson
Packard

* *European Equipment*



KLAXONET

Lovell-McConnell Mfg Company Newark, N.J. U.S.A.

KLAXON

"The Public Safety Signal"



KLAXON

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Studebaker

A Studebaker Dealer Can Offer—

a car—that in material, workmanship and easy running qualities—is the peer of any car built—and you pay less money for it.

And when you have admired the mechanical excellencies of the Studebaker car, the long wheelbase, the special get-attable Studebaker motor, the clean cut, artistic lines of the body, you'll be ready to enthuse over details of elegance that make for perfection in a motor car.

Where can you find a car that compares in mechanical excellence and luxurious appointments with the Studebaker "35"?

It carries comfortably six passengers, has more power than the standard "35" and with its 116-inch wheelbase is distinctively in the big car class.

A comparison between this car and any other car of like character in the market is all in favor of the Studebaker "35." Full floating rear axle, long stroke motor, electric self-starter and lighting system, valves enclosed. Pump and magneto set on cross shaft directly in front of cylinders, which runs silently from the camshaft gear. The entire design is for the utmost convenience of the owner, and illustrates at every point the most modern and approved engineering practice. The wheels are of the quick demountable rim type with 34 x 4 inch Goodrich quick detachable tires. Then there's the deep full tufted upholstery, the heavily nickeled metal parts, the simple, elegant windshield, clear-vision, self-ventilating type, Studebaker Jiffy curtains. Extra rim and tire irons and all equipment for comfort, safety and use.

Take it all together, the Studebaker "35" is a car that cannot be bought elsewhere for several hundred dollars more.

The price of the Studebaker "35" is $1290.

In addition to the "35" there is the Studebaker "25," a light, desirable, four cylinder car for $885, and the Studebaker "Six," the last word in motor elegance and luxury for $1550.

STUDEBAKER CARS

"20" Delivery Car	$800	"30" Touring Car	$1190	"Six" Touring Car	$1550
"20" Roadster	835	"35" Touring Car	1290	"Six" Roadster	1550
"25" Touring Car	885	"35" Sedan Type	2050	"Six" Limousine	2500
		"35" Coupe	1850		

All prices for cars fully equipped F. O. B. Detroit

THE STUDEBAKER CORPORATION

DETROIT, MICH.

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MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXXIV
No. 3

New York, January 9, 1913

Ten cents a copy
Two dollars a year



First Impression—First Aid to Sales

Inferentially, a car that is well finished is well made. The best way to sell a good car is to finish it beautifully. And the best way to finish any car beautifully is to use Berry Brothers Automobile Varnishes and Baking Enamels. Every dealer has to stand back of his sale for a long time. That's where the permanency as well as the beauty of Berry Brothers Automobile finishes counts twice in every sale.

Any car of any type at any price can have this double selling help by the right use of our special finishes.

BERRY BROTHERS

Largest Manufacturers of Varnishes, Shellacs, Air Drying and Baking Japans, Lacquers, Stains, Fillers and Dryers.

FACTORIES—Detroit, Mich., and Walkerville, Ont.

BRANCHES—New York, Boston, Philadelphia, Baltimore, Chicago, Cincinnati, St. Louis, San Francisco.

Published Weekly by the Motor World Publishing Company, 1600 Broadway, New York

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Mr. Car Agent—YOU add to your Sales Arguments—

—when the car YOU sell has Truffault-Hartford Shock Absorbers as part of its equipment.

Buyers know what this equipment does for a car. Years of persistent advertising has taught them. They know how this device saves the engine and tires—how it prolongs the life of the car—what it accomplishes in cutting down up-keep expense. And knowing these things they expect the car they buy to include this equipment.

It is so much to the dealer's advantage to have the car he handles Truffault-Hartford-equipped that there are now 27 leading automobile manufacturers installing Truffault-Hartfords as part of their regular equipment.

Insist on this equipment from the manufacturer you represent. It furnishes you additional sales-arguments. It is an aid to bigger car sales—it is an acknowledged necessity for comfortable, safe and economical motoring.

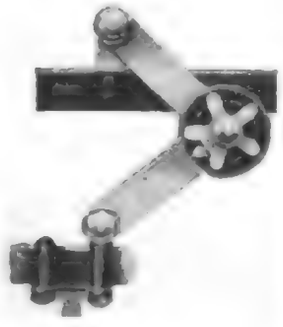
Hartford Suspension Company

EDW. V. HARTFORD, President

Factory, 164 Bay Street, Jersey City, N. J.

BRANCHES:

NEW YORK—1700 Broadway.
NEW YORK—212-214 West 88th St.
JERSEY CITY—141-143 Morgan St.
BOSTON—319-325 Columbus Ave.
CHICAGO—1458 Michigan Ave.
DETROIT—803 Woodward Ave.
KANSAS CITY—1524 Grand Ave.
NEWARK—289 Halsey St.
PHILADELPHIA—1437 Vine St.
INDIANAPOLIS, IND.—448-450 N. Capitol Blvd.



Truffault-Hartford

SHOCK ABSORBER

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SPRINGFIELD
CONVERTIBLE BODIES

Springfield Metal Bodies are standard on the majority of America's leading cars for the very good reason that they embody all the quality made possible by years of experience in the art of aluminum and steel body construction. This illustration shows one of the many body designs turned out by our factory.

With a Springfield Convertible Body it is actually possible to convert an open car into a glass enclosed car, luxurious in appointments and beautiful both inside and out.

The operation takes but a few moments—the result should be actually seen to be appreciated.

Weight is important in considering the ordinary closed body. Excessive weight of such a body reduces speed and adds to tire weight. Springfield Convertible Bodies, as compared with the common type, increase the weight of the open car only 50 or 75 pounds.

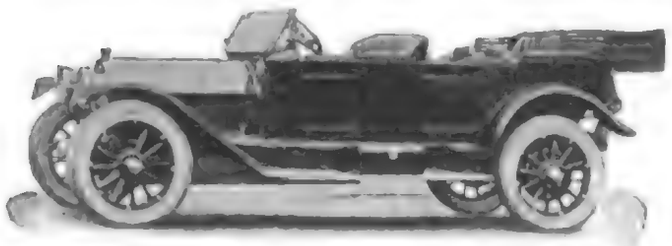
Springfield Convertible Bodies are noiseless. There is no rattle or squeak, and owing to the absence of a solid roof there are no reverberations so noticeable in limousines and landaulets.

There is much more to be said. Your inquiry will bring the details.

SPRINGFIELD METAL BODY CO.
Springfield, Mass.



"Service and Silence"



Kline Kar Model 6-60, Touring, $3500

DEALERS

YOUR experience with other cars should tell you that it does not pay to handle a line that constantly worries the life out of you with complaints from the user, who has trouble with the machine. This user knows now that he is better off when he buys a car of quality in the first place, even though he must pay a little more for it, and he will soon begin to demand such a car of his dealer.

It is up to you to have the car in your line when he calls. The Kline Kar will answer all the requirements this prospect may impose and more.

Prices $1850 to $3500
(Fully Equipped)

Get Our Proposition

Kline Motor Car Corporation
ORK, PA. RICHMOND, VA.

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MONOGRAM OIL

A Dependable Oil

To the owner or driver, because the quality is always the same.

To the dealer, because he can depend on us to be fair in turning retail business over to him.

To the distributor, because we protect those who handle our product both as to price and territory.

To the automobile manufacturer, because he knows it can be obtained almost everywhere by the owners of his cars.

NEW YORK LUBRICATING OIL CO.
Consolidated with
Columbia Lubricants Co. of N. Y.
116 Broad Street, New York City

BRANCHES AT NEWARK, BOSTON, CHICAGO, CLEVELAND, PHILADELPHIA, SEATTLE, SAN FRANCISCO, LOS ANGELES, SPOKANE, LONDON, ENGLAND; JOHANNESBURG, SO. AFRICA

$985

Completely Equipped

Overland

$985

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High-Priced Feature No. 10

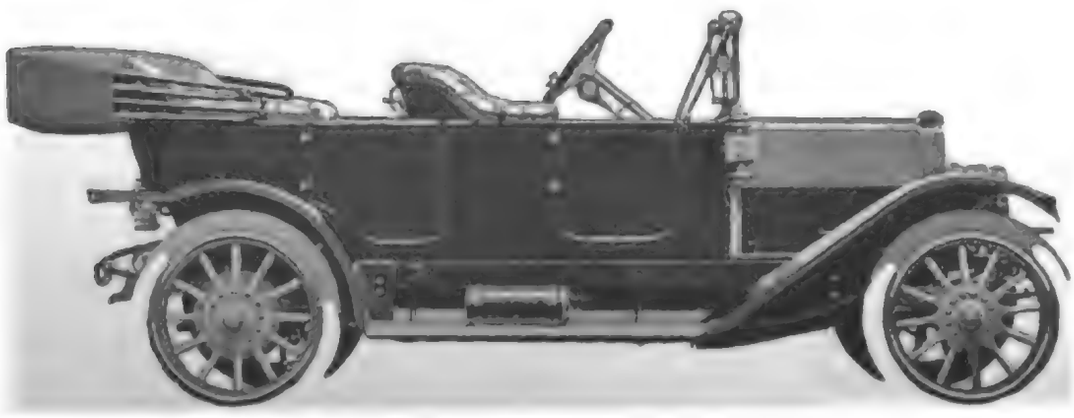
Every Overland Model 69T is full-powered. This is ascertained by a rigid dynamometer test.

A dynamometer not only registers a motor's power at varying speeds, but also the fuel and oil consumption, temperature of cooling water, efficiency of the carburetor and all other data necessary in an exhausting motor test.

You can not secure greater care in the building of your car for twice the price of the Model 69T.

A post card will bring a splendid catalogue. Please address Dept. 50.

The Willys-Overland Company
Toledo, Ohio



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LONDONER BUYS AMERICAN PARTS FOR BRITISH CAR

Without Heralding, Vickers Prepares to Meet "American Invasion" by Assembling $600 Model—Ritz "Tea Party" Recalled.

Apparently having no reference to the more or less famous Ritz "tea party" in London, at which means were discussed to combat the so-called "American invasion," the firm Vickers, Bristow & Co., Ltd., of London, have taken to themselves one of the "weapons" which was talked of on that occasion—i. e., the use of American parts in the assembling of a low-priced car.

The first that was known of the London firm's intention in this regard was the appearance in this country of Laurence Vickers himself, who, without fuss or fireworks, has been making the rounds of the parts trade and placing orders for the necessary material which will permit of the assembling in England of a four-cylinder runabout which will sell for $600. He has contracted for engines, transmissions, frames, axles and most of the necessary smaller parts.

When the chassis is assembled in London it will, of course, be fitted with a body of English design and manufacture and will enter the lists as an active competitor of the Ford car, which has attained a great vogue in Great Britain, where it sells for $650.

At the Ritz "tea," which was given by an aroused London editor last September, and which was attended by a number of the best known English tradesmen, they talked of forming a syndicate composed of motor car manufacturers, each of whom would contribute a specified sum and add to his line a popular priced model, which it was proposed to produce first of American parts and later of wholly English manufacture.

W. M. Letts, who has represented several American cars in London, was the originator of the rather Utopian idea, which, however, has ended in talk. Since that time it has been stated that the agitation which led to the Ritz "tea" was merely an ingenious means of masking and paving the way for the exploitation of a company which already had been well planned and which purposed turning to advantage the main idea which had been exploited. Whether Vickers, Bristow & Co. is the company or firm in question is something that remains to be seen.

To Manufacture Tires in Kentucky.

The Speedway Tyre Co. is the title of the $250,000 corporation which just has been formed in Louisville, Ky., and which represents the most ambitious effort to establish a tire factory in the south. Three factory sites are under consideration, and when one is selected an eight-story concrete building will be put up. The officers of the company are: Harry L. Lewman, of Louisville, president; L. D. Lewman, of Atlanta, vice-president; Fred Haupt, of Louisville, second vice-president; W. N. Cox, president of the Louisville Public Warehouse Co., treasurer; Dr. Fred L. Koontz, secretary. G. W. Greene, an experienced rubber man, will be manager of the company. The president of the company, in which Eastern capital is interested, is also the head of the Lewman-Cox Realty Co., of Louisville.

Midgley Tread Before Highest Court.

Although the United States Supreme Court rarely takes cognizance of patent litigation, the Hartford Rubber Works Co. has appealed to that tribunal for a rehearing of the suit involving its Midgley wire tread. In the United States Circuit Court of Appeals for the Second Circuit, sitting in New York in November last, the tread was held to infringe the Calvin T. Adams patent, No. 609,320, owned by the Metallic Rubber Tire Co., of Jersey City, N. J., after the lower court in Hartford had declared the patent invalid. The result of this move is awaited with no little interest.

LYONS-ATLAS OBJECTS TO BIDS OFFERED FOR U.S. MOTOR

Indiana Creditor Upsets Cut-and-Dried Sale of Property—Court Will Decide To-Morrow—Two Bids by Reorganizers.

The sale of the assets of the United States Motor Co. in the United States District Court for the Southern District of New York on Wednesday last, 8th inst., was not exactly the cut-and-dried affair that was expected, due to the unlooked for appearance in the Federal building in New York City of J. W. Lyons of the Lyons-Atlas Engine Works, of Indianapolis, and his attorney, Henry Wollman, who proved a thorn in the side of the reorganizers when he arose in meeting several times and expressed emphatic opinions of the whole proceedings. Wollman declared that the bids submitted, and one of which probably will be accepted, were ridiculously low and that the property should not be disposed of for such sums as were offered.

Before he left he indicated that, should the opinion which Judge Hough will hand down to-morrow, 10th inst., authorize the acceptance of one of the bids, he would appeal from the order confirming the sale and move to have the sale set aside. The Lyons-Atlas company, which purchased the Atlas Engine Works after the latter failed owing to the large amount owed it by the United States Motor organization, claims that it is owed $95,000 by the Dayton Motor Co., and that the claim is secured by the United States Motor Co., which, if true, will about double the amount the Lyons-Atlas may receive under the reorganization plan. If, however, the claim, or part of it, is against the United States Motor Co. only, the Lyons-Atlas payment would shrink perceptibly.

When court opened there were about 30 interested persons on the spectators' benches, among whom were Walter E.

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anders, who will become president of e new company; W. F. McGuire, its se- cted vice-president, and several other adesmen of note. Inside the rail which parated the spectators from those who id business there were Lyons and Woll- an, Roberts Walker and W. E. S. Strong, ie receivers; James N. Rosenberg, of osenberg & Levis, receivers' attorneys; lbert Rathbone and Henry V. Poor, of te attorneys for the creditors and reor- anizers; Harold Remington, an attorney, presenting the Cincinnati (O.) Ball Crank o. and the Troy (N. Y.) Carriage Shade o., and one or two other attorneys.

Check for $300,000 With Bids.

As soon as Judge Hough took his seat, t 11 A. M., Roberts Walker, one of the eceivers, opened an envelope and removed irst a certified check for $300,000 on the Merchants' National Bank of New York City, and then proceeded to read the ac- ompanying bids, which were made by Henry C. Holt and William McAllister, Jr., representing the reorganization committee. The first was for the whole, as follows:

No.		
1	The United States Motor Co....	$3,700,000
2	Alden-Sampson Mfg. Co.....	265,000
3	Brush Runabout Co.....	350,000
4	Columbia Motor Car Co.....	390,000
5	Dayton Motor Car Co.....	975,000
6	Maxwell-Briscoe Motor Co....	1,400,000
	Total	$7,080,000

The second bid was for the purchase separately of each company and is the bid which the court is believed to view with greatest favor; in this case lump sums were not quoted, but $50,000 was given as a deposit on each of the six parcels and the bidders agreed to pay a certain per cent. of the obligations of each company, as follows: United States Motor Co., 32½ per cent.; Alden-Sampson, 24 per cent.; Brush, 33 per cent.; Columbia, 91 per cent.; Dayton, 39 per cent.; Maxwell-Briscoe, 60 per cent. The latter bid is said to be the better for the creditors, in that it guarantees them a certain percent of their claims, whereas under the lump sum bid, No. 1, the receivership expenses must be met from the price, which will make the percent received by the creditors less than the percentages in the second offer.

Receivers' Report Explains Action.

After the bids were submitted, the Court asked Walker to read the receivers' report; in this document Walker stated that the receivers, when they took over the management of the big concern, had open to them three courses: To shut down the plants, to manufacture on an enlarged scale, or to conserve the assets in as great a degree as possible. The latter course was chosen and the receivers, as well as they could, finished the plan of manufacture laid out for the year of 1912. Day by day employes who were not needed were dismissed and as certain work was completed by a department that department was shut down. This meant that no preparations could be made for the 1913 selling season, which therefore has gone to waste.

Operating Loss Amounts to $380,000.

Whole plants eventually were shut down; the Maxwell shops in Auburn, R. I., were closed and certain unfinished cars were shipped to the plant in Newcastle, Ind., which plant is the only one rated as a going business. In the Dayton and Columbia shops at the present time certain large cars are being completed, but the activity is near the minimum. The receivers saw no way of avoiding some loss, and considered themselves fortunate in that quick assets, between September and the day of sale, decreased only $380,000. In all, 1,638 cars were completed at a cost of $2,350,000 and 1,514 cars and a quantity of parts were sold at a price of $1,970,000 to the big motor company, a loss of $126,821 to the subsidiaries and accounting for the $380,000 loss.

Attorney Wollman had been sitting quietly ever since court opened, and about this time he wanted to know the relation of the bids to the value of the properties. It was explained that the receivers had had estimates made of the "auction values" of the properties of the various companies and that, using these in part and in part using their own judgment, they had fixed certain values as those which the parcels would bring at auction; generally it was 27 per cent. of the original cost. The comparison of the bids with these values showed them to be from 85 to 87 per cent. of the estimated figures, which is 85 to 87 per cent. of 27 per cent. of the original cost. The comparisons were:

	Appraisement.	Bid.
U. S. Motor Co.	$4,590,742.32	$3,700,000.00
Alden-Sampson..	308,238.00	265,000.00
Brush	409,842.00	350,000.00
Columbia	402,439.00	390,000.00
Dayton	1,125,504.00	975,000.00
Maxwell-Briscoe	1,590,881.00	1,400,000.00
Totals	$8,427,646.32	$7,080,000.00

The appraisements exceed the bids by $1,347,646.32. Cash in hand amounts to $354,176.76.

Claims of $1,000,000 Not On Books.

The Court, in looking over papers submitted by the receivers, noticed the inclusion among the claims of some $1,000,000 which was not on the books of the company and, remarking that nothing was so open to suspicion as such items, asked Walker to read publicly the various amounts. The largest was a claim of $500,000 by the Carlson Motor Truck Co., which several months ago succeeded in court in proving that the long-used opposed Maxwell motor infringed the Carlson patent. Other claims were for materials furnished and for broken leases.

Wollman then voiced another protest and asked why, in a reorganization pamphlet gotten out by the committee, certain real estate was priced at $7,850,000, was finally appraised by the receivers at $2,600,000 and was made the subject of a bid of $2,300,000 when the Standard Motor Co., which has been incorporated to take over the reorganized company, is incorporated at $31,000,000. It was explained that the first figure was that at which the property was carried on the United States Motor books and that the $31,000,000 capitalization was not a point at issue.

When things had again subsided the receivers stated that the liabilities filed against the various companies amounted to: United States Motor Co. and subsidiaries, $12,750,000; Dayton Motor Car Co., $2,653,000; Columbia Motor Car Co., $430,000; Brush Runabout Co., $1,081,000; Alden-Sampson Mfg. Co., $1,133,000. Maxwell-Briscoe showed assets of $490,800 above liabilities.

Little Worry Over Bankruptcy Cases.

The fact that creditors last week filed a petition in bankruptcy in Indianapolis against the Maxwell-Briscoe Motor Co. does not seem to worry the reorganizers, who state that the dispute is merely a question of whether the claims are owed by the Maxwell or the big Motor company, the reorganizers claiming the latter and stating they will be able so to prove and thereby upset this action. The claimants and claims are: Kahler Co., New Albany, $15,951.14; Newcastle Lumber Co., $3,745.46; Newcastle Foundry Co., $2,647.75; National Spring Co., Newcastle, $23,502; Whiteley Malleable Iron & Casting Co., Muncie, $7,947.54; Muncie Foundry & Machine Co., $13,864.84; Muncie Wheel Co., $2,693—all are Indiana companies, and among those in the $1,000,000 not on the company's books. These creditors are the same who just before their petition in bankruptcy asked the court to order the Newcastle plant sold separately on the grounds that it is solvent and a going concern, and the present action is but another means toward the same end. They allege preferential payments and fraudulent transfer of property. The bankruptcy petition filed some time ago in Trenton, N. J., against the parent company, likewise, is not seriously considered.

In order that the general meeting of creditors, of which the court proceedings are a part, might not terminate with any detail unfinished, the meeting was adjourned to 10 A. M., January 29, but the sale is not adjourned.

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DECLARES PREST-O-LITE PATENT EXPIRED IN 1910

Disagreeing with Other Tribunals, Federal Court of Appeals Settles Vexed Question—Victory for Searchlight.

After having been successful in seven United States District Courts and one United States Circuit Court of Appeals in its litigation for infringement of the Claude and Hess patent, No. 664,383, under which it operates, the Prest-O-Lite Co., of Indianapolis, received a setback in the United States Circuit Court of Appeals in Chicago, which on Tuesday last, 7th inst., held with Judge Kohlsaat, then of the District Court in that city, that the Prest-O-Lite patent "died" nearly three years ago. Judge Kohlsaat's decision was the first against the Prest-O-Lite Co. and, because of the long string of favorable decisions, the appellant hoped it would succeed in reversing this verdict. The defendant in the action was the Searchlight Gas Co., of Chicago, whose operations are similar to those of the Prest-O-Lite.

The question which was considered was one of patent law relating to the expiration of American grants of foreign patents. The law prior to 1897 was that a foreign patent taken out in America expired when the foreign grant became void, but this limtaoni was removed in 1897, the restriction, however, still applying to those for which application had been made prior to the change in the law.

The Claude and Hess patent, the British number of which is 29,750, was applied for prior to the change of statute but was not granted until December 25, 1900, wherefore the Prest-O-Lite Co. claimed its patent did not expire with the English grant, which ended its term June 30, 1910. The Appellate Court ruled against the Prest-O-Lite company on this point, which makes the patent useless since June 30, 1910.

Another construction of the case is that while the British patent covers a "process" the American grant, even if it has expired, is a separate patent in that it covers an "apparatus" in which a needle valve was designated as coming within that portion of the letters which call for a "regulating valve." The court also held with the Searchlight company that the needle valve does not meet the specifications of the patent and that it was the same as the English patent.

The overthrowing of the patent does not mean that the Prest-O-Lite company will appear in the courts no longer, for much of its previous litigation has been under the trade-marked receptacle law, which statute forbids the refilling of such a receptacle by a company other than the manufacturer. Numerous violations under this law have been prosecuted, and nothing thus far has disturbed the company's right to continue that form of litigation.

Teaboldt's Suit Reacts for Mezger.

Whatever C. R. Teaboldt & Co., one-time metropolitan dealer in Everitt cars, expected to get when it brought suit in the Supreme Court for New York county against the Metzger Motor Car Co., of Detroit, Mich., for $14,520 because of trouble over a dealership contract, it apparently was disappointed this week, when the case was decided against it; in fact, instead of securing a verdict, Teaboldt & Co. were condemned to pay a counterclaim of $4,499.44 set up by the defendant Metzger company.

The substance of the Teaboldt complaint was that its contract was revoked in 1911 after it had booked 111 orders and was about to cash in on a goodly amount of business. The Metzger story is that the dealer was short of funds and that another dealer therefore was engaged. Counterclaims of the Metzger company were $4,179.44 for parts unpaid for, and $3,902.83 due on an advertising contract. Both concerns are no longer in the lists of business houses; Teaboldt is now in the West and the Metzger company recently became the Flanders Motor Co.

Mason Stock Seller Sued for Fraud.

Alleging fraud, the Mason Motor Co., of Waterloo, Ia., has instituted suit in that city against J. J. Slicer for the sum of $186.60. The complaint declares that in November, 1911, Slicer was engaged to sell Mason stock and bonds, and while in St. Louis for that purpose he wired the factory for $60 to cover the expenses of a party of four which, he stated, he desired to escort to Waterloo to investigate the Mason property. The money was wired to Slicer, but according to the Mason allegements, he acted fraudulently in the matter and never rendered the service for which the money was forwarded.

Franklin Declares 200 per Cent. Dividend.

At a stockholders' meeting held on Friday last, 3rd inst., the capital stock of the H. H. Franklin Mfg. Co. of Syracuse, N. Y., was increased from $300,000 to $1,500,000. The new stock consists of 9,000 shares of common stock of par value of $100 each and 6,000 shares of preferred stock, 7 per cent. accumulative, of par value of $100 each. The increase in the common stock was brought about by the declaration of a 200 per cent. stock dividend upon the present capital stock.

U. S. MOTOR REORGANIZERS DECIDE TO DROP TRUCKS

Their Manufacture Will not be Continued by New Company—To Utilize Sampson Plant for Four-Cylinder Car.

When the Standard Motor Co. takes over the assets of the United States Motor Co., one of the departments of the business which will be wiped out will be that of truck manufacture, which heretofore has been carried on in the Alden-Sampson plant in Detroit.

The decision to discontinue the production of trucks has been one of the knotty internal problems with which the reorganizers of the big corporation have had to do. They were divided into two camps, so to speak, one for and the other against the truck, and the "against" finally won the day.

The Alden-Sampson engineering staff, of which Preston H. Breed was the head, has been discontinued and the Sampson factory, it is understood, probably will be used for the production of a $1,075 four-cylinder touring car which now is being developed in Detroit. The former Brush runabout plant also will be used for the same purpose, as it is the intention to produce the new model on a large scale.

Chief Engineer Breed, who is now at liberty, is one of the veterans of the motor truck industry, his first experience dating back some 12 years. He was with Alden-Sampson when the first Sampson truck was brought out, in 1907, and has followed its fortunes ever since.

Friendship and Business Tangle Suit.

Whether Frank P. Anderson, an automobile dealer in Syracuse, N. Y., borrowed $1,600 from Miss Mary H. Walsh or failed to deliver a car for which she paid, is the point at issue in an action which she has brought against Anderson in the Municipal Court in that city; John S. Munro of Camillus, N. Y., who advanced $34,000 to set up Anderson in business, is named as co-defendant. Miss Walsh claims Anderson agreed to sell her a car for $900 and that on June 16 last he went to her and asked her for $1,600, saying he had her car and another at the freight station and needed that amount to get them, agreeing to repay $700 as soon as he saw Munro. Anderson's claim is that when he and Miss Walsh were returning from a North Side restaurant one night she agreed to loan him the $1,600, to be repaid when he could do so, and that he never entered into an agreement to give her a car.

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FREIGHT CAR SHORTAGE IS PRIMARY CAUSE OF A SUIT

Buick Chassis Damaged in Transit Fall into Hands of Used Car Dealer —Exporters Seek to Prevent Sale for Speculation.

One of the unusual effects of the freight car shortage which has inconvenienced automobile manufacturers in Michigan and elsewhere is reflected in an action filed in the Supreme Court for New York county wherein the General Motor Export Co., exporter of Buick cars, seeks to enjoin the Rodney K. Haines Co., a used car dealer in New York City, from selling fourteen Buick chassis; how the chassis came into the possession of the Haines company and are classed as "used" is a part of the car shortage story.

The incident had its inception last spring when the Buick Motor Co. began to ship from Flint, Mich., to its exporting agent in New York City a number of chassis which by fall had totaled fourteen. All might have been well had freight cars been available, but they were not, and the dozen and two chassis were loaded onto flat cars and sent eastward. Even this might not have been so bad, but after they arrived in New York they frequently were stored in exposed places by the railroad company, and the whole experience was such, according to the complaint of the exporting company, that the dashes warped, coils and magnetos were practically ruined, gears, motors, wheels, bearings, flywheels and other metal parts rusted, the veneer blistered and chipped and the one coat of paint that the chassis had been given had trouble in withstanding the weather, and the goods were in anything but good condition when the exporters received them.

Believing that damage might accrue to the reputation of the Buick company and the exporting company if these chassis were sent abroad, it was decided to sell them in New York, and as similar injury was thought possible if they were sold through a used car trader, search was made for a buyer who would agree to put them to service for his own and not use them for speculative purposes. The claim is that the Haines company acted as the broker in this deal and secured as a customer Walter J. Connell, who operates a garage and taxicab service in Flushing, L. I. A price of $6,000 with an additional $15 for lighterage was made to him for the fourteen chassis, and it is claimed Connell bought them on November 12 last with the knowledge of their condition and agreed to fit them with taxicab bodies and place them in service, expressly agreeing not to sell them for speculation.

The complaint further recites that Connell directed that the chassis be delivered to the Haines company that the latter might fit bodies and equip the cars for taxicab service; the delivery was made to the Haines company and not many days thereafter the New York branch of the Buick company began to write letters to the export company berating the latter for having offered the chassis for sale to the trade and public as used. The Yonkers Buick dealer is said to have lost a sale because a prospective buyer picked up a bargain from the Haines company, and documents are submitted by the plaintiff in support of its claim that the Haines company offered the chassis for general sale, admitted it was so doing and refused to desist.

The export company's reply to the Buick people was that it could not understand the situation, since its contract of sale forbade the sale of the chassis, but when the Buick branch continued to complain of the damage the resale was doing, in the way of originating stories of misrepresentation and similar practice, the export company sued for an injunction. A temporary order was granted December 24 restraining Haines from selling what he had left of the fourteen and restraining Connell from violating the terms of his contract. The matter was to have been argued Monday last, 6th inst., but was adjourned to Monday, 13th inst.

Assignee to Sell Canadian Plant.

The Harding Motor Car Co., Ltd., of London, Ont., which undertook to build cars in that Canadian city about a year ago, is to be sold by the assignee on January 14th next. The assets are appraised at $24,176, of which plant, machinery, patterns, tools and equipment are valued at $14,583.90, and stock in trade, which includes finished and unfinished parts, $9,190.71. The remaining $400 represents a demonstrating runabout.

Warner-Stewart Litigation Ended.

Following the purchase of the Warner Instrument Co. by the Stewart & Clark Mfg. Co. and the formation of the new Stewart-Warner Speedometer Corporation, patent litigation between the two companies has been ended; the case of Warner vs. Stewart & Clark involving patent No. 823,237, which had been for some time in the United States District Court for the Southern District of New York, was formally withdrawn this week.

Branch for Long Horn in Chicago.

The G. Piel Co., Long Island City, N. Y., manufacturers of the Long horn, have opened a branch in Chicago at 1322 Michigan avenue. It is in charge of R. G. Ames.

CHANNING FAILS TO UPSET WEED CHAIN'S INJUNCTION

Court of Appeals Sustains Lower Court's Grant of Temporary Restraining Order—"Anchored" Chains the Issue.

In what has proved one of the most stubbornly fought of the many actions involving the Parsons patent, No. 723,299, in which the Weed Chain Tire Grip Co. has engaged, that against the H. Channon Co., of Chicago, the Weed interests scored another victory on Tuesday last, 7th inst., although it by no means decides the main point at issue.

It took the form of a decision by the United States Circuit Court of Appeals for the Seventh Circuit, sitting in Chicago, sustaining the action of Judge Sanborn in the lower court in granting a preliminary injunction against the Channon company. Judges Baker, Seaman and Kohlsaat, who constituted a Court of Appeals, held that Judge Sanborn had not erred or abused judicial discretion in granting the preliminary injunction.

The case involves the right of the Channon company, and all others, to manufacture so-called "anchored" tire chains, and really grows out of the decision of the same Court of Appeals in the Excelsior Supply case, in which it was ruled that the Parsons patent covered the creeping type of chain. Thereafter the Channon company, which manufactures Gripwell, Ruffshod and other chain grips, developed an "anchored" chain, the "anchoring" being effected by means of strips of chain or leather which were accompanied by instruction cards directing the purchaser to "anchor" the grips on the wheel so as to prevent creeping around the tire, which, the Weed company claims, is but an attempt to disclaim infringement.

Soon after these chains made their appearance on the market, and in response to a challenge issued by the Channon company, the Weed people instituted the suit which on April 25th last resulted in Judge Sanborn's issuance of a preliminary injunction. He held that the "anchoring" was an obvious subterfuge by which it was hoped to evade the Parsons patent without reasonable expectation that the "anchors" would be used.

The Channon company promptly appealed, with the result, as stated, that on Monday last the Sanborn preliminary injunction was sustained. In due course the fight on the merits of the Parsons patent's application to "anchored" grips will be taken up and settled.

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The Week's Incorporations

Racine, Wis.—Perfex Radiator Co., under Wisconsin laws; authorized capital, $15,000; to manufacture radiators.

Portland, Me.—Apperson Automobile Co., under Maine laws; authorized capital, $10,000; to deal in motor cars.

Barnsville, Minn.—Broadway Garage Co., under Minnesota laws; authorized capital, $5,000; to operate a garage.

Des Moines, Ia.—Des Moines Motor Car Co., under Iowa laws; authorized capital, $25,000; to deal in motor cars.

Grand Rapids, Mich.—Valley City Supply Co., under Michigan laws; authorized capital, $25,000; to deal in motor car supplies.

Grand Rapids, Mich.—Grand Rapids Taxicab Co., under Michigan laws; authorized capital, $1,000; to operate a taxicab service.

Camden, N. J.—Starr Garage, under New Jersey laws; authorized capital, $50,000; to operate a garage. Corporators—H. H. Grace, and others.

Jersey City, N. J.—Wheel of Fortune Co., under New Jersey laws; authorized capital, $600,000; to deal in motor cars. Corporators—J. R. Turner, L. H. Gunther, H. A. Block.

St. Louis, Mo.—J. T. Moss Motor Car Co., under Missouri laws; authorized capital, $10,000; to deal in motor vehicles. Corporators—T. J. Moss, J. W. Fristow, E. J. Dykstra.

Tulsa, Okla.—Western Auto Supply Co., under Oklahoma laws; authorized capital, $50,000; to deal in motor car supplies. Corporators—Frank Walfe, R. J. Meyers, F. W. Dye.

Rockford, Ill.—Rockford Motor Truck Co., under Illinois laws; authorized capital, $10,000; to manufacture motor vehicles. Corporators—P. A. Peterson, Levin Faust, John Ledin.

Detroit, Mich.—Detroit Tractor Co., under Michigan laws; authorized capital, $50,000; to manufacture tractors. Corporators—George J. Baker, Frank E. Baker, Mary J. Baker.

Milwaukee, Wis.—William H. Wegner Co., under Wisconsin laws; authorized capital, $5,000 to deal in motor car supplies. Corporators—W. C. Wegner, W. H. Wegner, I. H. Kurz.

Bridgeport, Conn.—Jones Pneumatic Tire Spring Co., under Connecticut laws; authorized capital, $100,000; to manufacture motor car parts. Corporators—Lyman D. Jones and others.

Turon, Kan.—Turon Motor & Implement Co., under Kansas laws; authorized capital, $6,000; to deal in motor cars and implements. Corporators—Al. Sprout, E. O. Allmon, G. E. Farney.

Somerville, Mass.—Caverly Automobile Co., under Massachusetts laws; authorized capital, $5,000; to deal in motor cars. Corporators—Irvin C. Caverly, William Thibodeau, Edna C. Caverly.

New Haven, Conn.—Motor Truck Sales Co., under Connecticut laws; authorized capital, $10,000; to deal in motor vehicles. Corporators—Julian Denison, Jessie F. Mabry, Howard W. Beach.

Canton, Ohio—Original Puncturefix Co., under Ohio laws; authorized capital, $50,000; to manufacture tire filler. Corporators—William E. Steinmetz, Edwin D. Meyers, Edward L. Hang.

Quincy, Ill.—Machinery & Motor Co., under Illinois laws; authorized capital, $25,000; to operate a motor car repair shop. Corporators—Benner Kinsey, Fred H. Wilms, Harry V. C. Tingley.

Cleveland, Ohio—Standard Castings Co., under Ohio laws; authorized capital, $100,000; to manufacture tire fillers. Corporators—Julius F. Janes, S. C. Cutler, E. H. Janes, M. M. Feidner, N. N. Calfee.

Painesville, O.—Vulcan Mfg. Co., under Ohio laws; authorized capital, $300,000; to manufacture motor cars. Corporators—E. B. Heartwell, F. H. Murray, J. C. Ward, Wm. F. Truby, H. E. Hammer.

Robinson, Ill.—Associated Auto & Supply Co., under Illinois laws; authorized capital, $2,500; to deal in motor cars and supplies. Corporators—J. M. White, J. W. Carlisle, R. J. Hunter, V. S. Welsh.

Newark, N. J.—Service Incorporation of New Jersey, under New Jersey laws; authorized capital, $25,000; to deal in motor cars Corporators—Stephen C. Renssaelaer, Francis Child, Jr., George Allen Dewey.

Rochester, N. Y.—Ball-Washburne Motor Co., Inc., under New York laws; authorized capital, $25,000; to deal in motor cars. Corporators—Ward H. Ball, Charles H. Washburn, Asa R. Ball, all of Rochester.

Lowell, Mass.—Ruggles Motor Sales & Repair Co., under Massachusetts laws; authorized capital, $3,000; to deal in motor cars. Corporators—Frederick W. Coburn, Winthrop A. Parkhurst, Alfred B. Ruggles.

New York, N. Y.—Electro Coach Co., under New York laws; authorized capital, $500,000; to deal in motor vehicles. Corporations—John Larkin, Alexander Andrews, Richard J. Lynch, all of 44 Wall street.

Robinson, Ill.—Associated Auto & Supply Co., under Illinois laws; authorized capital, $2,500; to deal in motor cars and supplies. Corporators—J. M. White, J. W. Carlisle, R. J. Hunter, V. S. Welch, D. McCarty.

Detroit, Mich.—Ostdyke Gear Shifting Co., under Michigan laws; authorized capital, $50,000; to manufacture gearsets. Corporators—Charles A. Ostdyke, Fred E. Holmes, Wilfred W. Campbell, John B. Whalen.

Indianapolis, Ind.—Wizard Motor Co., under Indiana laws; authorized capital, $50,000; to manufacture motors for cyclecars. Corporators—Orlando C. Forbes, Edward H. Habig, Park S. Florea, all of Indianapolis.

New York, N. Y.—E. J. Sullivan Corp., under New York laws; authorized capital, $5,000; to deal in motor cars. Corporators—Robert G. Ballantine, Rye, N. Y.; Eugene J. Sullivan, Walter F. Hopper, both of 590 West 174th street.

Jamestown, N. Y.—Eagle Garage Co. of Jamestown, Inc., under New York laws; authorized capital, $25,000; to operate a garage. Corporators—Samuel B. Robbins, Olive M. Spencer, Jamestown; George Rappole, Remus Point.

New York, N. Y.—Wholesale Auto Tire Co., under New York laws; authorized capital, $1,000; to deal in motor car tires. Corporators—Wm. P. Cole, 83 Chambers street; David Morris, 26 Oliver street; Abraham Levy, 277 Broadway.

Buffalo, N. Y.—United States Rubber Reclaiming Co., Inc., under New York laws; authorized capital, $2,400,000; to reclaim rubber. Corporators—Theodore W. Basset:, Rudolph A. Lowenthal, 277 Broadway, New York City; Cornelia Beebe, Ellenville, N. Y.

West Seneca, N. Y.—George Schuster Garage & Sales Co., Inc., under New York

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laws; authorized capital, $5,000; to operate a garage and deal in motor cars. Corporators—Jacob F. Berner, Reinhold C. Berner, George Schuster, all of Buffalo, N. Y.

New York, N. Y.—General Interboro Auto Express Co., under New York laws; authorized capital, $3,000; to operate a motor delivery. Corporators—George I. Pound, 920 Bryant avenue; John Pallett, 509 East 79th street; P. Pound, 543 East 85th street.

New York, N. Y.—Haverty's Taxicabs, Inc., under New York laws; authorized capital, $1,000; to operate taxicabs. Corporators—Charles O'Brien, *227* East 57th street; Charles O'Brien, Jr., *233* Alexander avenue; Margaret V. Curran, *332* East 58th street.

New York, N. Y.—Drouet & Page Co., under New York laws; authorized capital, $10,000; to manufacture motors. Corporators—Conrad Milliken, 421 West 114th street; Ingrid E. Larsen, 17 Marion avenue, Tompkinsville, S. I.; Martin B. Hoffman, *38* Park Row.

New York, N. Y.—Stewart-Warner Speedometer Corp., under New York laws; authorized capital, $25,000; to deal in motor car accessories. Corporators—Elmer E. Holmes, *327* Sterling place, Brooklyn; J. K. Stewart and C. B. Smith, both of 1828 Diversey Boulevard, Chicago, Ill.

New York, N. Y.—New York Motor Speedway Association, Inc., under New York laws; authorized capital, $1,000,000; to conduct motor contests. Corporators—William B. Allen, Seattle, Wash.; Herbert J. Carter, 368 East 158th street; Alfred B. Casner, *263* Madison street, Brooklyn.

New York, N. Y.—Frank M. Randall Mfg. Corp., under New York laws; authorized capital, $5,000; to manufacture motors. Corporators—Frank M. Randall, 148 West 52nd street; Philip K. Stern, 521 West 187th street; Louis B. Rosenberg, 113 West 42nd street; J. Chas. Weschler, 527 West 110th street.

Tiffin Trucks Nearly Ready for Market.

Having decided to engage in the manufacture of motor trucks, the Tiffin Wagon Co. of Tiffin, O., has moved much more rapidly than first had been thought possible. As a result, its first two models have been thoroughly tested out and it is expected that its trucks will be ready for the market not later than the middle of February.

Increases of Capitalization.

Richmond, Ind.—Pilot Motor Car Co., from $5,000 to $150,000.

Moline, Ill.—Velie Motor Vehicle Co., from $600,000 to $800,000.

Syracuse, N. Y.—H. H. Franklin Mfg. Co., from $300,000 to $1,500,000.

USE OF TIRE FILLERS MAY ANNUL CAR GUARANTEES

N. A. A. M. Recommends Such Action —Also Takes Steps to Erect Special Automobile Building at Panama-Pacific Exposition.

Hereafter motorists who treat their tires with any of the thousand-and-one so-called "tire fillers" may pay a high price for it. It is probable that the use of such tire fillers automatically will terminate the guarantee covering the car itself. It is certain, at any rate, that the executive committee of the National Association of Automobile Manufacturers, at its monthly meeting, held in New York yesterday, formally decided to recommend to its members that such action be taken.

Practically all of the tire manufacturers long since provided that the "doctoring" of their tires with any of the so-called tire filling concoctions abrogated their guarantees. Like action by the car makers, therefore, is not wholly surprising. The action of the National Association of Automobile Manufacturers grew out of a conference with the tire committee of the Motor and Accessory Manufacturers, Inc.

At yesterday's meeting of the N. A. A. M. committee, the first step was taken toward the housing, in a special building, of all automobile exhibits at the Panama-Pacific Exposition in San Francisco in 1915. Representatives of the exposition were in attendance and the consultation was of an extended nature. The show committee presented a plan for the erection of a special building for the purpose, which plan will be submitted to all members of the association for approval. It provides for the erection of a structure 360 x 600 feet, which probably will be styled the "Automobile Palace," and in which will be staged not only all exhibits of cars but of motorcycles and accessories.

The N. A. A. M. contest committee reported a tentative agreement with the contest board of the American Automobile Association relative to the control of contests, under which it is contemplated that the N. A. A. M. will take the place and perform most of the functions formerly exercised by the Manufacturers' Contest Association.

Indianapolis was added to the N. A. A. M. circuit of local shows. It was assigned the week covering the dates March 24th to 29th, inclusive.

Among other business transacted was the election of C. B. Warren as representative of the Haynes Automobile Co., E. O. Sutton as representative of the Knox Automobile Co. and J. T. Ranier as representative of the Garford Co.

Weed Adjuster Infringers Settle.

When the Weed Chain Tire Grip Co. instituted suits in the United States District Court for the Southern District of New York against the 35% Automobile Supply Co. and its owner, Albert B. Norwalk, in one suit, and Charles Weiland, in another action, all of New York City, charging infringement of patent No. 953,673, under which Weed tire chain adjusters are made, opposition was expected, and the complainants were much surprised last week when both defendants backed down and agreed to make substantial settlements for past infringements. The adjusters in question are a combination of springs and chains which extend over the face of the wheel and hold the grips tightly against the tire. The action of the defendants resulted in the issuance of perpetual injunctions. The two defendants had been selling the alleged infringements.

Remington Standard in Bankruptcy.

Involuntary proceedings in bankruptcy were instituted in the Federal court in Brooklyn, N. Y., on Tuesday last, 7th inst., against the Remington Standard Motor Co., a West Virginia corporation, whose principal place of business is Farmingdale, L. I. The petitioning creditors are Charles P. Hollister, $1,530.77; George J. Mercer, $176.89; and J. H. Rooney, $86. About a year ago the Remington company acquired a license to use the Manly hydraulic drive and built one truck in which it was employed. It got no further, however, and only last month inventor Manly himself instituted proceedings against the company for royalty and other debts.

Secures Judgment for Kilgore Advertising.

Final papers in an action brought in the New York City Court by the Frank Presbrey Co., an advertising agency, against the Kilgore Mfg. Co., of Boston, Mass., a manufacturer of shock absorbers, were filed this week, the agency taking judgment for $1,148.75; the action was based upon advertising service rendered between December, 1909, and June, 1910, in connection with space in newspapers in a number of the large Eastern cities.

Moores to Make Trucks in Michigan.

The Moore Truck & Mfg. Co. has been organized in Wyandotte, Mich., to manufacture the Moore patent self-loading barrel truck. It has acquired manufacturing facilities in the Debo building. Its officers are as follows: President and general manager, F. A. Moore; vice-president, E. Moore; treasurer, Dr. C. W. McColl; secretary, T. E. Moore.

In the RETAIL WORLD

Wickland & Britton have opened a garage in San Jose, Cal.

Donald R. Macfarlane is building a repair shop in Berkeley, Cal.

The Knox Automobile Co. of Illinois, located in Chicago, has dissolved.

G. A. Lewis is about to have a garage built in Mankato, Minn. It will cost $9,800.

E. M. Parsons is about to enter the trade in Carnarvon, Ia. He will sell Abbott-Detroits.

Under the style Dow & Green Garage, a new firm has entered the trade in San Francisco.

M. Kroon has taken over the interest of his partner, L. Johnson, in the Craig (Ia.) Auto Co.

Salyers & Kayton have taken over the business of the Ribbins Auto Co., in Malvern, Ia.

The Oconto Falls (Wis.) Motor Car Co. has taken possession of a new garage, 36 x 58 feet.

A garage is being erected in Sacramento, Cal., on K street, for J. D. Lauppe; it will cost $11,500.

William Walterskirchen has had plans prepared for a new garage to be constructed in Missoula, Mont.

J. B. Hanlon has leased the W. F. Nott Garage in Galva, Ill. William Soderburg will act as manager.

H. O. Spencer and Merle Parsons, of Bangor, Me., have leased the Grange Stables and will open a garage.

Frank B. Ridgway has asked authority to erect a garage in Bridgeton, N. J., at Atlantic and Hampton streets.

Behlin & Sons, of Cincinnati, O., have let the contract for a new garage; it will be erected on Rockdale avenue.

The Beloit (Wis.) Auto & Machinery Co. has been formed in that city; it will handle the goods indicated by its title.

Ray Cleveland, of Albany, Minn., has transferred his garage business to Anton Gruenke; the latter will continue it.

Ash & Philips, dealers in West Union, Ia., have dissolved partnership; Ash will continue the business, Philips retiring.

E. A. Walden and A. C. Gray have had plans drawn for a new garage in Hollywood, Cal. The estimated cost is $5,500.

Under the style Burke Garage a new business is about to be established in Lincoln, Ill. A garage is now being erected.

A. F. Francis has sold his interest in a garage, located on 10th street, Moundsville, W. Va. H. W. Perkins was the purchaser.

Newton B. Smith has opened a garage in New Brunswick, N. J., at 222 Nelson street; he also will handle Marion and Studebaker cars.

The Elliot Motor Car Co. has been formed in Salt Lake City, Utah, with Harry Elliot as manager; Oakland cars will be stocked.

Roy Golden and Percy A. Collins have opened a garage and repair shop in Petoskey, Mich. They also will conduct a livery business.

Harry McCurdy has bought an interest in the Western Slope Auto Works, in Grand Junction, Col. The company's garage is to be improved.

Simeon Kimmell has sold his interest in the Hoffman & Kimmell Garage, on 5th street, Marysville, O. Hoffman's son was the purchaser.

The Garrison Garage Co. is about to build a new garage in the Walbrook section of Baltimore, Md. The cost will be approximately $12,000.

Bartlett W. Shryock is about to enter the trade in Fort Wayne, Ind. He will locate in the Phillips Garage and will handle Studebaker cars.

Perl W. DeVendorf, of Watertown, N. Y., has bought out the Warner Automobile Co., of 155 Arsenal street; he will take with him the Ford agency.

Centre Avenue Garage is the style of a new business in Reading, Pa., at 93 Rose street; storage will constitute the main portion of the business.

The Colonial Motor Co., of Baltimore, Md., is about to open a new garage on North avenue; Studebaker cars and Universal trucks are handled.

C. C. McNeer, farmer and auctioneer, has purchased an interest in the Blue Grass Garage, of Chariton, Ia. The style hereafter will be Vaughn & McNeer.

C. O. Donner, of Alexandria, Minn., has purchased the interest of his partner, J. A. Bailey, in the Alexandria Auto Co. Donner will conduct the business alone.

J. Duecker of Louis Corners, Wis., has inaugurated an automobile passenger service between Manitowoc and Kiel, in the same State; his car seats 32 passengers.

Maxfield & Southwick, of Mofille, Ia., have established a second agency, in Sioux City; they have located in the Bennett Motor Mart and will distribute Pullman cars.

The Broadway Garage, of Harrisburg, Pa., which recently became the Mt. Pleasant Garage, has returned to its old name under another change in management; it is located at 1358 Thompson street.

Zinnel & Daehler, a new firm, have opened up in Clinton, Ia., at 120-24 Sixth avenue; besides operating a garage, the firm will sell Ford cars. Both members formerly lived in Mt. Carroll, Ill.

Martin E. Hon, formerly president of the Tennant Motor Co., Ltd., of Chicago, has become manager of the Marmon Chicago Co. New quarters for the Marmon have been taken at 2429 Michigan avenue.

J. F. Sanchez, of Syracuse, N. Y., is about to establish a garage and agency in Calgary, Alta. He will stock Moyer cars. In Syracuse, he was connected with the Chalmers-Syracuse Co., formerly the John H. Valentine Co.

Samuel A. Yout has purchased the business of the Reinman & Wolfort Auto Co., in Little Rock, Ark., and will continue it under the style Arkansas Auto Exchange; the garage, at 3d and Louisiana streets, will be remodeled.

C. A. Herberg Rubber Co. is the style of a new concern which just has been organized in Wichita, Kan., to handle Fisk tires; C. A. Herberg, the company's head, formerly was a member of the Auto Supply & Tire Co. in that city.

The Hippe Motor Car Co., which was formed by business men of Chilton, Wis., in response to a demand, has opened for business in a garage, 50 x 80 feet, with two stories and a basement; it is well equipped. Robert Hippe is manager.

M. E. Humbarger, formerly manager of the Collingwood Garage in Toledo, O., has sold his interest in that business and will open up for himself at 238 Erie street; his future business will consist of the sale of Apperson cars and repairing.

E. F. Morgan, of St. Paul, Minn., has purchased the interest of his partner in the Morgan-Bond Motor Car Co. and will continue the business as the E. F. Morgan Co. As heretofore, it will consist of a truck transfer line and the Rauch & Lang electric agency.

Following the recent reincorporation of the G. W. Hawkins Automobile Co., of Houston, Tex., as the Hawkins-Halff Co., a new building has been completed at Dallas avenue and Main street; it contains salesrooms, 65 x 85 feet, and a garage, 65 x 130 feet, separated from the salesrooms by fireproof doors.

Joseph Hallett and Bert Miller, who have conducted the Toonen & Barlament Garage in De Pere, Wis., have dissolved partnership; Hallett will continue the business.

Bruce Gray and Bert Horton have purchased the E. T. Remmert Garage in Geneseo, Kan. They have increased the garage's livery equipment.

H. M. Duyckinck, who has been manager of a branch of Duyckinck, Sterrett & Co., on South Queen street, Rising Sun, Md., has entered the trade for himself; he has taken over the branch, removed to a new garage on East Main street and will carry on the business under the style Rising Sun Garage. The plant has a well equipped machine shop.

"Garage de Luxe" is the term which the Warren Automobile Co., of St. Louis, Mo., applies to the new salesrooms and service station which it opened up with the new year; it is located at 3048 Locust street and is unusually attractive, the walls being white brick, the floors white tile and the woodwork mahogany. The company handles Warren gas cars and Argo electrics.

The Hughes-MacDonald Motor Car Co., recently formed in Milwaukee, Wis., has leased the Johnson Garage at 239-41 Wisconsin street and will remodel the building; the concern will handle the Ohio electric, Garford trucks and pleasure cars and Flanders "sixes." John MacDonald, Jr., who will act as manager, formerly was connected with the Kopmeier Motor Car Co. in that city.

Minor Business Troubles.

Margaret A. Devine of Brookline, Mass., a dealer in automobile supplies, is in the bankruptcy court; the liabilities are $875 and the assets $75.

An involuntary petition in bankruptcy has been filed against the Acme Motor Car Co., of Worcester, Mass., by creditors whose claims aggregate $1,467; preferential payments are alleged.

An involuntary petition in bankruptcy has been filed against the Knoxville (Tenn.) Auto & Garage Co. It is claimed that the company owed the defunct Knoxville Banking & Trust Co. about $20,000. Edward Akers was named receiver.

Alvie G. Williams, formerly an automobile dealer in Syracuse, N. Y., has filed a petition in bankruptcy in the Federal court in Utica, in the same State; his 21 creditors include: Syracuse Rubber Co., $45; William Cronin, $25; William Marshall, $47, and J. P. Miller, $113.

Because the petitioning creditors failed to appear when the case was called in the Federal court in New York City, the petition in bankruptcy, filed against Alexander Goldner October 6, 1911, was dismissed last week; Goldner traded as the Broadway Auto Top & Body Co., at 136 West 54th street.

An accumulation of financial difficulties caused the Simpson Automobile Supply Co., of 251 Division avenue, South, Grand Rapids, Mich., to file a trust mortgage last week; an indebtedness of $14,000 is acknowledged. Prior to this action, seven judgments were taken against the concern, amounting to $1,193.75.

A receiver in bankruptcy has been appointed in the Federal court for the North Main Street Garage Co. of Decatur, Ill. The liabilities are estimated at from $12,000 to $14,000, with assets of from $4,000 to $5,000. The petitioning creditors are Decatur concerns or individuals, the largest claims being $642.61, by D. W. Tilson, and $587.03, by the Decatur Railway & Light Co.

The Wright Rye Motor Co. of Sheridan avenue and Chapel street, Albany, N. Y., for which a receiver was appointed by the New York Supreme Court for Albany county, December 14, when the directors admitted insolvency, has been made the object of a petition in bankruptcy, filed in the Federal court in Utica, N. Y., by creditors who allege that mismanagement by the directors, Albert E. Grant, Sr., of Troy; Albert E. Grant, Jr., Horace A. Raynor and Walter E. Ward, caused the embarrassed condition. The Federal court appointed a receiver who will take the business from the hands of the appointee of the Supreme Court.

Changes Among Prominent Tradesmen.

Richard Ferguson has been appointed factory manager of the Grant-Lees Machine Co., of Cleveland. Previously he was in charge of one of the Buick plants in Flint, Mich.

L. B. Sanders, former sales manager of the Lion Motor Car Co., has been appointed to a similar post in the Abbott Motor Co. of Detroit. He succeeds W. P. Bush, resigned.

L. I. Stewart, for the past two years chief purchasing agent for the Warner Mfg. Co. of Toledo, O., has been promoted to the post of sales and advertising manager. The vacancy created by his elevation has been filled by the appointment of W. L. Rowe, his former assistant.

W. M. Roberts, former sales manager of the Packers Motor Truck Co. of Wheeling, W. Va., and latterly manager of the New York branch, has resigned that connection to become sales manager of the Mais Motor Truck Co. of Indianapolis. He, of course, will make his headquarters at the Mais factory in that city.

H. P. Ziegler, manager of the Goodyear Tire & Rubber Co.'s Milwaukee branch, has been promoted to the post of district manager with headquarters in Chicago. His appointment carries with it supervision of the Goodyear branches in Chicago, Milwaukee, St. Paul, Minneapolis, Omaha, Des Moines and Sioux City.

Chester S. Ricker, chief engineer of the Henderson Motor Car Co. of Indianapolis, and designer of the Henderson car, has resigned that office to set up for himself as a consulting engineer. Before leaving the Henderson employ he completed the design of an electric engine starter, and will be retained in an advisory capacity to design a Henderson "six."

Harry J. Galvin, for several years chief accountant and later auditor of the Remy Electric Co. of Anderson, Ind., has resigned that position to become president and general manager of the Galvin Specialty Co., which recently was organized in Anderson and with which W. R. Poland, at one time general manager of the Remy company, is identified. The new company, however, will not have anything to do with automobile productions; it will make tailoring and laundry machines.

Recent Losses by Fire.

Pomeroy, Ia.—J. W. Lockie, garage destroyed. Loss, $10,000.

Centerville, Ia.—King Auto Co., 12th street, garage damaged. Loss, $6,500.

Lowell, Mass.—Moody Bridge Garage, Joseph Marion, owner, destroyed. Loss, $20,000.

Roanoke, Va.—Valley Motor Vehicle Co., 115 Luck avenue, garage and cars damaged. Loss, $20,000.

Calgary, Alta.—Motor Transportation Co., 11th avenue, garage and 12 cars destroyed. Loss, $21,000.

Washington, Pa.—Union Motor Car Co., garage destroyed by fire which followed explosion of gasolene. Loss, $25,000.

Los Angeles, Cal.—Vance-Canavan Motor Co., 1122 South Olive street, salesrooms and garage damaged and several cars destroyed. Loss, $10,000.

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MOTOR WORLD

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GASOLENE SITUATION CALLS FOR ACTION.

It does not seem possible that the National Association of Automobile Manufacturers, the Automobile Board of Trade, the Society of Automobile Engineers, the American Automobile Association, or any of the other organizations which seek to promote the welfare of the automobile industry, much longer can afford to permit what has come to be known as the gasolene situation to pass without official recognition and official action of some sort.

After the brief lull which marked the meteoric rise in the price of the fuel last year, the producers have returned to the attack again and the cost has been increased and, according to indications, there now is no telling when or where it will stop. It is reasonably certain, at any rate, that unless those concerned with the well-being of the automobile industry seek some avenue of relief "the high cost of motoring" soon may vie with the much-mooted "high cost of living." As Motor World pointed out many months ago, the rising cost of fuel constitutes a truly serious menace to the sale and operation of commercial vehicles, and apparently it is approaching a cost which will give pause even to intending purchasers of pleasure cars.

While supply and demand affords the readiest explanation, and while there is no doubt that the demand has increased in greater ratio than has the supply, the inequitable prices which have prevailed in various parts of the country during the past year indicate that, however ready, the supply and demand explanation is not a sufficient one. Also the fact that the chief producers of gasolene have continued to pay exorbitant dividends on exorbitant capitalizations suggests strongly that the money-mad men higher up are more concerned with pyramiding millions than with doing real justice to the public.

It is in these directions that the automobile organizations should promote inquiry. The most notable contribution to the subject which has seen the light was published in Motor World of September 19th last, when a calorific engineer who had intimately served one of the large oil companies, pointed out avenues which promised relief.

He suggested what technically are known as "long cuts" as one solution of the problem. He also suggested that engine designers may assist in relieving the situation by creating a greater vacuum or increasing the compression in order that engines may make use of fuels of lower gravity than gasolene. Likewise he indicated that prices are being increased not wholly by the law of supply and demand, but because the chief producers of gasolene fear to undersell each other because of the probability of a price war which may affect the products of petroleum other than gasolene in which the profits of one company or the other are particularly handsome.

There is much that can be done by the automobile organizations, if they will but do it, and where the interests for which they stand are so seriously menaced, there appears to exist the best reason in the world why they should do something without delay.

AMERICAN WAYS AND FOREIGN WAYS.

It may or may not be of particular significance one way or the other, but it is an interesting fact, which an inspection of the exhibits at the Importers' Salon brings somewhat sharply to mind, that it is some time since American manufacturers of automobiles gave up trying to accomplish certain results through complex and roundabout methods, making mechanical sacrifices for the sake of theoretical gains that, in most cases, remained in the realms of theory.

The fact that some of the foreign manufacturers have been able, through the employment of extremely high grade materials and the finest kind of workmanship—all of which is very expensive—to obtain excellent results from a rear axle construction, for instance, which involves the use of numerous universal joints and the transmission of power through many angles, when the same result might be accomplished through simple bevel gears and straight shafts, or from a control system with many adjustments constantly at the mercy of the driver, when equally good average results doubtless could be obtained by means of less easily upset mechanism, speaks volumes for the manner in which the designs have been worked out and the kind of workmanship that has been employed. In fact, it is highly probable that with less attention to detail disaster would result.

It is impossible to help wondering, however, if better results could not have been obtained by applying an equal amount of skill and care to the perfection of direct and simple ways of doing the same things. A feature of the American car now is its simplicity, and it is difficult to comprehend why the simple method is not the best method.

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January 4-11, Montreal, Can.—Annual automobile show in the Drill Hall and Armory, under the auspices of the Automobile Club of Canada.

January 6-11, Cleveland, Ohio—Cleveland Automobile Show Co.'s exhibit in the Central Armory.

January 11-17, Milwaukee, Wis.—Annual Show of the Milwaukee Automobile Show Co. and the Milwaukee Progressive Automobile Dealers' Association in the Auditorium.

January 11-18, New York, N. Y.—Automobile Board of Trade's 13th annual show in Madison Square Garden and Grand Central Palace. Pleasure cars only.

January 13, New York, N. Y.—Meeting of the Executive Board of the American Automobile Association in Hotel Belmont, 2 P. M.

January 14, New York, N. Y.—Annual meeting of the Automobile Board of Trade in New York offices, 7 East 42nd street.

January 15, New York, N. Y.—Tenth annual meeting and fifth annual banquet of the Motor and Accessory Manufacturers' Association in the Waldorf-Astoria, 5:30 and 8 P. M.

January 16, 17, 18, New York, N. Y.—Midwinter meeting of the Society of Automobile Engineers, in Hotel McAlpin.

January 17, New York, N. Y.—Annual Dinner of the Society of Automobile Engineers, in the Hotel McAlpin, 8 P. M.

January 20-25, Philadelphia, Pa.—Philadelphia Automobile Trade Association's exhibit in the First and Third Regiment Armories.

January 20-25, New York, N. Y.—Automobile Board of Trade's 13th annual show in Madison Square Garden and Grand Central Palace. Commercial vehicles only.

January 21-26, Toledo, Ohio—Annual show in the Exposition building under the auspices of the Toledo Automobile Shows Co.

January 25-February 1, Providence, R. I.—Annual show of the Rhode Island Automobile Dealers' Association in the Providence State Armory.

January 27-February 1, Ottawa, Can.—Annual show of the Ottawa Valley Motor Car Association in Howick Hall.

January 27-February 1, Scranton, Pa.—Third annual show of the Scranton Automobile Dealers' Association in the 13th Regiment Armory.

January 27-February 1, Detroit, Mich.—Detroit Automobile Dealers' Association's Show in the State Armory.

February 1-8, Chicago, Ill.—National Association of Automobile Manufacturers' 12th annual show in the Coliseum and 1st Regiment Armory. Pleasure cars only.

February 3-8, Washington, D. C.—Washington Automobile Show Co.'s exhibit in Convention Hall.

February 8-15, St. John, N. B.—First annual show of the New Brunswick Automobile Association in the Drill Hall.

February 8-15, Youngstown, Ohio—Annual show of the Youngstown Automobile Show Co. in the Auditorium and Annex.

February 8-15, Hartford, Conn.—Sixth annual show of the Hartford Automobile Dealers' Association in the State Armory.

February 10-15, Minneapolis, Minn.—Minneapolis Automobile Show Co.'s show in the National Guard Armory.

February 10-15, Chicago, Ill.—National Association of Automobile Manufacturers' 12th annual show in the Coliseum and 1st Regiment Armory. Commercial vehicles only.

February 12-15, Geneva, N. Y.—Annual show in the State Armory, under the auspices of the Ottawa Valley Motor Car Association.

February 15-22, Albany, N. Y.—Annual show of the Albany Automobile Dealers' Association in the State Armory.

February 15-22, Newark, N. J.—New Jersey Exhibition Co.'s Sixth annual exhibit in the First Regiment Armory.

February 16-23, Richmond, Va.—Richmond Automobile Dealers' Shows Co.'s exhibit in the Horse Show building.

February 17-27, Kansas City, Mo.—Kansas City Automobile Dealers' Association's show in Convention Hall. First week pleasure cars; second week commercial vehicles.

February 19-22, Davenport, Ia.—Annual show of the Tri-City Automobile Dealers' Association in the Coliseum.

February 19-22, Oshkosh, Wis.—Oshkosh Automobile Dealers' Association's second annual show in Armory B.

February 20-22, Canandaigua, N. Y.—Motor Car show in Hawley's Garage, under the management of A. Blumenstein.

February 22-March 1, Brooklyn, N. Y.—Brooklyn Motor Dealers' Association's third annual show in the 23rd Regiment Armory.

February 24-March 1, Omaha, Neb.—Omaha Autmobile Dealers' Association's annual show.

February 24-March 1, Cincinnati, Ohio—Third annual show of the Cincinnati Automobile Dealers' Association in the Cincinnati Music Hall.

February 25-28, Topeka, Kan.—First annual show of the Kansas Motor Show Co.

February 26-March 1, Fort Dodge, Ia.—Second Annual show of the Fort Dodge Dealers' Association in Armory.

January 27-February 1, Rochester, N. Y.—Fifth annual show of the Rochester Automobile Dealers' Association in Exposition Park.

March 1-8, Paterson, N. J.—Second annual show of the Paterson Automobile Dealers' Association.

March 3-8, Pittsburgh, Pa.—Pittsburgh Automobile Dealers' Association's show in Duquesne Garden.

March 3-15, Des Moines, Ia.—Des Moines Automobile Dealers' Association's fourth annual show in the Coliseum. First week pleasure cars; second week commercial vehicles.

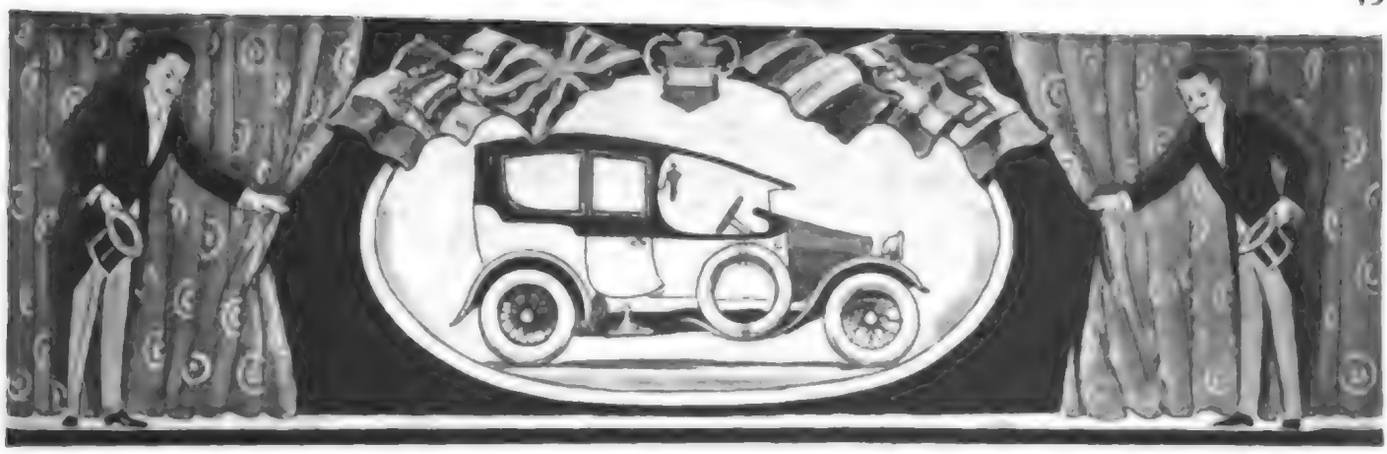
March 10-15, Dallas, Tex.—Annual show of the Dallas Automobile Dealers' Association in the Fair Grounds Coliseum.

March 20-24, New Orleans, La.—Annual show of the New Orleans Automobile Dealers' Association.

Four "Private Shows" in New York.

Inability to procure space adequate, or sufficiently well located, either in Madison Square Garden or in the Grand Central Palace properly to display their lines, is responsible for the non-appearance at the impending show of four accessory exhibitors who have been prominent figures in shows of yesteryear—the Bosch Magneto Co., Jones Speedometer, Eisemann Magneto Co., and the J. S. Bretz Co., importer of F & S ball bearings. A more than ordinarily comprehensive display of the various Bosch products, with special emphasis on that portion dealing with the new oil and waterproof ZR types of instruments, will be staged at the salesrooms of the Bosch company, 223 West 46th street; at the Eisemann salesrooms, 225-227 West 57th street, a display equally interesting will be made in which Eisemann types E. M. and E. A. with bascual and automatic advance, respectively, and the newer low priced instrument, type E. B., with separate transformer coil, will figure largely. Several new models of the Jones instrument in combination with clocks will be on view throughout "show week" at the Prince George Hotel, 27th street, between Madison and Fifth avenues; naturally, the older models also will be shown. The J. S. Bretz Co., 250 West 54th street, will display the newer series of F & S ball bearings which utilize the new and impressively simple "blue ribbon" ball retainers.

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FOREIGN CARS IN AN AMERICAN SETTING

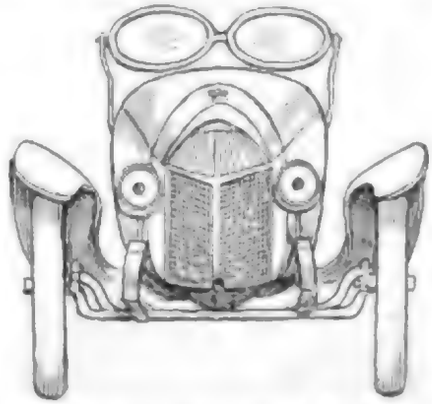
Machines in Keeping with Surroundings at Importer's Salon in Astor Ballroom—Indications of Unusual Attention to American Requirements—Starters Getting a Foothold—Body Work of Home Builders a Feature.

It is not likely that the atmosphere of the Importers' Salon ever can be anything but foreign, broadly speaking. There are too many characteristics of other nationalities to permit anything different.

To begin with, the dignified, not to say magnificent, setting provided by the grand ball-room of Hotel Astor in New York is so different from the surroundings of any of the simon-pure American automobile shows that one instinctively associates it with things that are imported and expensive, and the modest banners bearing names that, for the most part, no two people pronounce alike, help not a little to strengthen the impression of un-Americanism.

To go a little deeper, but still keeping to the superficial, there is an undeniable richness of finish that characterizes the mechanical portions of the exhibits and shows through dull, quiet colors as well as taking the glare from the more brilliant hues which, however, are sparingly used. Look at that dark-colored cylinder, for instance. At a little distance it looks rather ordinary; but on closer view it exhibits a smoothness and high finish that almost makes one doubt that the substance under the finish is cold, hard, cast iron. There are indescribable touches in the machines as a whole and in the separate details that somehow proclaim foreign workmanship.

Go still a little deeper. There's a magnificent car—that Isotta, finished in white. What a perfect piece of body-work! It certainly is remarkable, the way these Italians can build really artistic bodies. Now, why can't American builders do work like that? Look at the body-builder's name plate for the answer and, behold! the body is an American body, built by Burr & Co., New York—and the knowledge that it is does not take the edge off one's appreciation of its beauty. Then pick out a real foreign body. One ought to be able to tell it if he is on the lookout for it. That's one, surely — that curious, narrow-hooded, round-backed runabout with individual windshields



DAIMLER TERRAPLANE BODY

that look like a pair of spectacles and wide, flaring mudguards that look like wings. That's the Austrian Daimler with a "terraplane" body. Oh, distinctly foreign, even to the curious metallic brown finish. Nevertheless, the body was built by Healey & Co., of New York! No end of those little "foreign touches" came straight out of Yankee workshops, and the foreigners themselves will "point with pride" to the American bodies on their imported chassis.

But not all of the exhibitors care to have their wares illustrated. At the Austrian Daimler stand, for instance, a special watchman is stationed to "shoo away" photographers and artists who seek to "take" the odd looking car on display.

Here's an innovation, for an importers' show: Look at that Hartford starter on the front of an Isotta Fraschinni car. But that was put on by special order, explains the attendant; it is not regular equipment; starters are not fitted except on order. Right across the aisle, however, there is a starter that is fitted as regular equipment. No less a car than the Renault is regularly equipped with a Ward Leonard electric lighting and starting system. That is, the cars brought to the United States are so equipped. But the only other car in the show with a starter is the Canadian Keeton, which has the Jesco electric system (made in Chicago) and a crankless front.

Just here is where one gets an impression. It is a show of foreign cars—yes; but more than ever before there is American influence at work. American workmanship and ideas are visible not only in body work, but in wheel diameters, in clearances, in springing for rough roads, and so on. Foreigners here appreciate some, at least, of the good things that are American, and make use of them. The result is that one leaves with a feeling that there is a good deal that is American about the Salon.

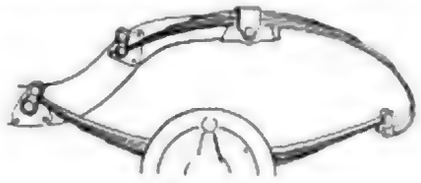
Of the various nations whose cars were exhibited at last year's Importers' Salon two are missing from the Astor ball-room, in which the show will hold the boards until Saturday next—England and Switzerland, which showed, respectively, the Napier and the Pic-Pic. The 1913 Salon holds the product of Austria (Daimler), Canada (Canadian Keeton), France (De Dion, Renault and Panhard), Germany (Mercedes), Italy

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VIEW LOOKING DOWN THE MAIN AISLE AT THE IMPORTERS' SALON IN THE BALLROOM OF THE HOTEL ASTOR

(Lancia and Isotta Fraschini) and Belgium (Metallurgique and Minerva). Canada is a newcomer. Cars that were shown last year but have not returned to the ball-room are the Benz, Charron, Darracq, Napier, Peugeot, Pic-Pic and S. P. A.

The promise of the last Salon of motors of the so-called valveless types, or of types in which the valves were other than poppets has not been fulfilled, for there were but two representatives of the poppetless schools —Panhard and Mercedes — both using Knight motors. The Panhard exhibit, however, is a whole-souled poppetless one, for every model has a Knight engine. A number of new features are embodied in the two chassis models shown, not the least interesting of which was the 20-horsepower four-cylinder Knight with unit power plant construction.



PANHARD ⅞ ELLIPTIC SPRINGS

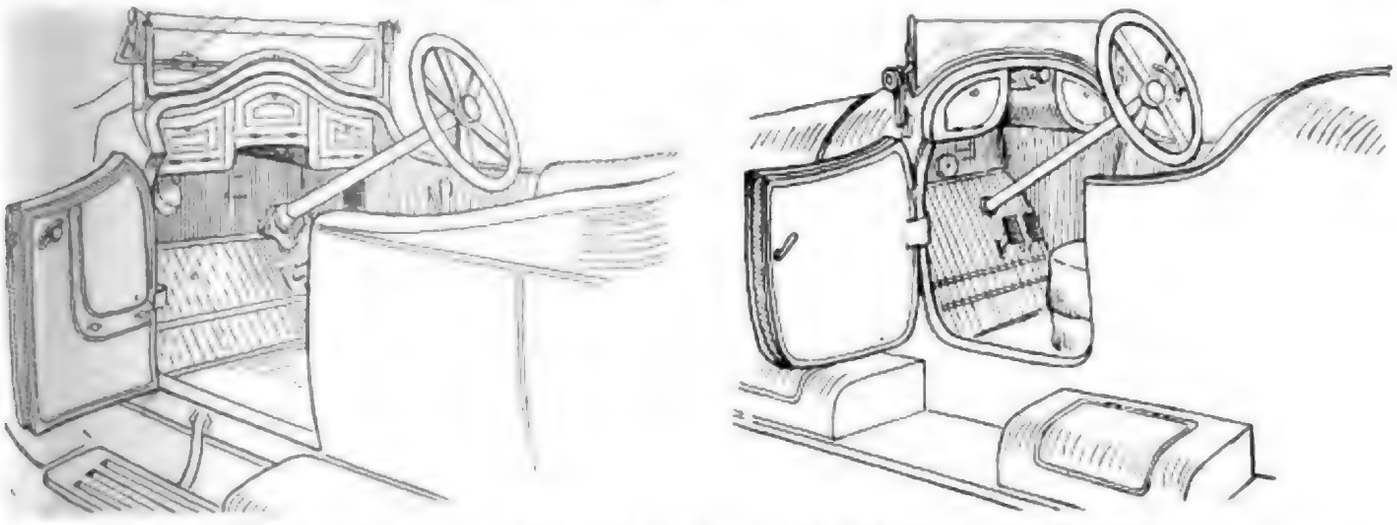
The rear springs are of the rather rare type known as seven-eighths elliptic cantilever springs. As the term implies, they lack but an eighth of being full elliptics. There are no rigid connections, except where the springs are clipped to the axle. As the accompanying illustration shows, the two front ends are shackled to the frame, the two rear ends are shackled together and the top member is pivoted to the sharply raised rear frame member. The springs thus have the utmost freedom of movement and transmit no driving strains. The front springs are semi-elliptic.

Final drive is through propeller shaft and bevel gears, the shaft being enclosed in a long, heavy torque tube which extends to the universal joint at the rear end of the gearbox. Three-quarters floating construction is employed in the rear axle.

Control is exceedingly simple. There are neither spark or throttle levers on the steering wheel. Ignition is by high tension magneto with set spark, while throttle control is by foot accelerator only, though a lever on the dashboard is provided to limit the minimum speed of the motor.

The 30-horsepower Panhard chassis differs from the 20-horsepower chiefly in the fact that the Knight engine, which has a bore and stroke of 100 x 140 millimeters, about 3.93 x 5.5 inches, respectively, has separately cast cylinders and is not a unit with the four-speed gearset, which is carried well back and connected with the rear axle through a short propeller shaft. Rear springs are three-quarter elliptic. The familiar Panhard throttle and spark spools are mounted on the steering wheel.

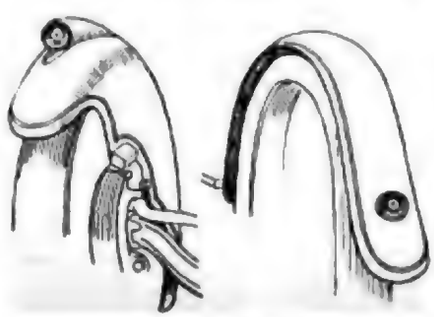
No little interest was manifested at last year's Salon in the De Dion chassis with 8-cylinder V-type motor. This year the same motor appears, but in a new setting—that is to say, in a new chassis, which has worm drive instead of bevel gears. The shaft system is complex and peculiar, and exhibits the kind of workmanship that is necessary to get good results from such arrangements —and there is no question but that the De Dion gets results. The propeller shaft is in two sections with two universal joints, which at once attract attention because of their size, and on closer inspection prove to be ball-bearing, there being four ball bearings in each joint. The first joint is directly back of the flange-cooled transmission brake, and the shaft defies precedent by taking an upward slant to the second joint, while the second section takes a still sharper upward shoot to bring it to the top of the worm-and-gear housing. The worm section of the propeller shaft is enclosed in a torque tube which terminates, at its forward end, at a round cross-piece to which it is clipped by a block which is free to rock with the motion of the car on its springs. The second universal, counting



CONTRASTS IN DASHES—RENAULT TOURING CAR AND METALLURGIQUE "BROOKLANDS STREAMLINE" BODY

The 20-horsepower Panhard chassis which occupies the place of honor at the front of the space, on the aisle, is of the polished exhibition kind, including the four-cylinder Knight engine, which, curiously enough, in most cars is left rather unfinished as to exterior. In fact, in the 30-horsepower Panhard chassis, further back, the Knight engine is of "regular" finish and is decidedly rough. Which may be said to point the moral that genuinely fine birds can get along very well without fine feathers. Nothing but Knight-engined Panhards are exhibited, and these only in 20-horsepower and 30-horsepower sizes.

The 20-horsepower motor has four cylinders, cast in pairs, the bore and stroke being 80 x 130 millimeters, or about 3.1 x 5.1 inches respectively both crankshaft and camshaft having three bearings. The casing which encloses the four-speed gearset is bolted to the crankcase making a unit power plant which is supported at three points. Lubrication is by splash from individual troughs; there is no oil pump.



I-F MUDGUARDS AND LAMPS

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from front to rear, is just forward of this cross shaft. The inevitable varying of length of the forward section of the shaft is taken care of by a telescoping joint of the feather-and-groove type.

The biggest thing in the ball-room, in point of power, is the enormous Isotta Fraschini 120-horsepower motor. Two of these are shown, one in a bare chassis and the other in a touring car which is the most conspicuous object of the I-F space. The body, which is finished in white and is the work of Burr & Co., is of the more or less conventional touring type exteriorly; but notwithstanding its enormous power it has room for but four passengers, who occupy individual seats. The mudguards of this machine are peculiar in that on all wheels they are of the narrow, curved type, following quite closely the tire contour, which is made possible in the case of the front guards by mounting them on the steering knuckles, so that they swing with the front wheels in steering. Broad aprons extend from the front guards to their supports, preventing the throwing of mud on the body. In the tops of the front guards and in the lower ends of the rear guards there are formed little hoods in which are enclosed small electric lights, those in the rear being red and the front ones white. Two demountable wire wheels are carried, complete with tires, one on each side of the huge engine hood, where they find plenty of room notwithstanding their considerable size. This particular machine has no crank, being fitted with a Hartford starting system, applied to the forward end, outside.

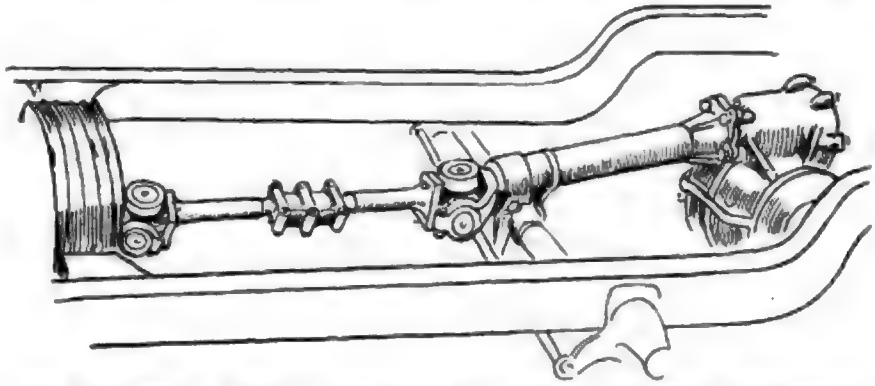
Another feature of the I-F exhibit is the Sankey steel wheel, which is supplied on order. This wheel is made up of two halves of pressed steel, which, before being put together, look like a hollow wheel that has been split edgewise, hub and all. The pressed-up sections are joined by a welding process, forming a wheel that is light—surprisingly light—strong, and free from bolts and nuts. These wheels are made only with clincher rims and are intended to be removed bodily in case of tire trouble, there being a quick-detachable feature in the hub which permits very rapid removal. The Isottas make a feature of the leather disk universal joints that were shown last year, and, incidentally, they are the only cars in the Salon that show final drive by side chains—excepting the big Mercedes racing car.

Dashboards at the Salon present the widest possible range of arrangement, running from a deeply cowled board with almost every available inch filled with instruments and what-not, to a straight, plain expanse of polished wood without a curve and without a break in its smooth expanse. The last is a feature of the new Renault chassis with 22-35 horsepower six-cylinder engine. The chassis is a beautiful one, and is of a type constructed especially with a view to use on American roads, having high clearance, re-enforced axles and special spring construction; Renault shock absorbers are fitted on the rear, and the rear springs are underslung.

The modest horsepower rating is a little surprising when compared with the outward size of the motor, which has its cylinder cast in threes. The bore and stroke are 3 5/16 x 6 inches, respectively—truly a long-stroke motor. The length of the cylinders and the liberal water jacket dimensions make the cylinders seem very large, while the big radiator, generous pipes and the wide-spreading blades on the rim of the flywheel, all familiar in connection with the Renault thermo-syphon cooling system, look together big enough for a much larger motor. The impression is in no wise diminished by the fact that the cylinders are considerably offset. The Renault is the only foreign car shown with an electric lighting and starting system as part of its regular outfit. A chassis is shown with the Ward Leonard two-unit system installed and working. The dynamo is in the engine space, while the starting motor is at the rear, driving to the flywheel through a large gear ring bolted to the rear side of the rim. Judging by the constantly recurring hum of the starter, and the continual stream of requests for information, such a system is by no means out of place on an imported car, and doubtless the next Salon will see an extension of the idea.

One of the most attractive dashboards at the show is on a Renault touring car; its peculiarity is in the attractive and convenient arrangement of three little lockers built on the top of the dash, following its contour, with doors opening downward. The wood is a light color with a handsome grain, well brought out, and the general appearance is as pleasing as the arrangement is useful.

It is, perhaps, just a little hard to decide whether the Canadian Keeton car ought to be regarded as a foreign product or not, for it is of American origin, and, anyway, Canada does not seem very "foreign." However, as the Keeton is shown in an importers' show and its price is quoted as including duty, it must be concluded that it is an importation, at least. The car is distinctly a big one, with a wheelbase of 136 inches, and has an extremely neat-looking 48-horsepower motor with six block-cast cylinders, a Renault type radiator, and is cooled by the thermo-syphon system. Drive is by propeller shaft through a four-speed gearset in which direct drive is on the third speed, the fourth being an overstep. The "Jesco" electric lighting and starting system is fitted as regular equipment; a single unit, running alternately as motor and dynamo, is carried at the forward end of the motor and is connected to the crankshaft by "silent" chain. Wire wheels are fitted exclusively, and the regular equipment includes an extra wire wheel complete with tire.



DE DION WORM DRIVE TRANSMISSION ELEMENTS, SHOWING UNIVERSALS

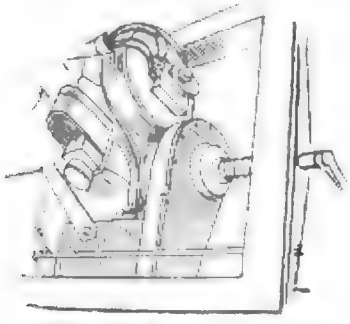
Among other features, this car has left side steering and center control, and is the only machine in the show to depart from the time-honored right side position. Incidentally, questions as to this style of control elicited from the foreign contingent superior smiles, an occasional shrug and such remarks as "What's the use?" "No; we do not want it," "Why should we make changes for no good reason?" etc.

The Metallurgique exhibit is a good example of the existing foreign attitude with regard to cars—that is to say, it is assumed that beyond a few generalities the public is little interested in mechanism. Consequently, not even a stripped chassis is on view. There are, however, some exceedingly interesting examples of foreign body work, which, it cannot be gainsaid, is deserving of more than casual attention. One, a six-passenger car of what is known as the torpedo "sporting" type, is built on a 56-60 horsepower chassis and is peculiar in that the entire body space is a single compartment, with a fixed rear seat for two, a fixed seat—an extremely comfortable looking one, by the way—for the driver, and three

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folding seats, one beside the driver's seat and the two others just forward of the rear seat. The whole arrangement gives an idea of sociability and a total lack of stiffness and formality, which is just what is intended, for the machine is designed to be driven by the owner. Another body, on an 85-90 horsepower chassis, is a roadster of the Brooklands type, with stream-line formation. This is a very striking turnout, and it includes a number of neat little details. The rear end of the turtle-back, for instance, is removable, revealing a space where a spare wheel is carried, and a little wash-basin in which the owner can remove the signs of toil from his hands after changing a wheel—for this, too, is an owner-driven car, and, like the other, is finished in white.

In the Mercedes space the center of attraction is the 90-horsepower four-cylinder racing car, with a big "22" on its narrow-ended hood, in which Ralph De Palma won the Elgin Trophy and the Vanderbilt Cup; the huge silver trophies at either end of the

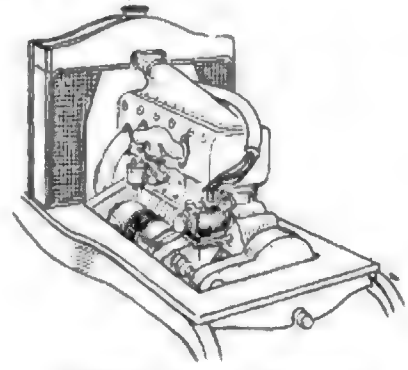


RENAULT DYNAMO DRIVE

machine provide an eminently suitable garnishment. Like many of the foreign makers, the Mercedes people have made no mechanical changes in their chassis. Many visitors to the show have asked to see the Mercedes-Knight engine, but are informed that none are being exhibited—in fact, Knight engines are fitted to imported machines only on special order. A big limousine is shown which has a carrying capacity of no less than eight passengers, there being sufficient width to allow the use of three extra seats; the third folds against the front of the rear compartment.

The Austrian Daimler exhibit may be said to center around the "terraplane" roadster—a "long, low, rakish" craft of the most pronounced type. It is mounted on an 80-horsepower four-cylinder chassis and is credited with enormous speed, and certainly the cut of the car is calculated to give an impression of the next thing to flying. The hood is extremely narrow and the rear tapers off to a stream-line point; the dash is cavernously cowled and the seating space is small. With very wide, spreading mudguards, heavily brass rimmed individual windshields of oval outline and a color that somehow suggests smoothness and absence of air friction, the car is unique—at least, so far as the Salon is concerned.

The stripped chassis shown in the Lancia exhibit serves the double purpose of exposing the mechanism and of proving that there has been no change in the construction of the machine, which is equivalent to saying that no change is required. Extremely clean-lined, block-cast, four-cylinder motors, with four-speed gearsets, are used in both 20-horsepower and 30-horsepower models. The Lancia makers give an option of steering column rake—either 38 or 50 degrees.



KEETON DYNAMO POSITION

The Belgian car, Minerva, shares with the Panhard the honor of exhibiting the Knight motor, though no stripped chassis is shown, and the exhibit centers around the bodies, which are of the most luxurious types. A particularly striking model is what the French call an "evening car," though just how it differs from a day car is not apparent. A five-passenger limousine "evening car" is upholstered gorgeously in what those who know refer to as Du Barry rose brocade. Not only are there cushions—or rather, pillows—and robes to match, but there are gold-mounted toilet articles and a little folding table upon which they may be spread.

Following is a summary of the exhibitors and the cars that are shown:

Adams-Lancia Co., New York City—Four four-cylinder, block-cast, Lancia cars; one each seven-passenger touring car, limousine, landaulet and roadster and one four-cylinder chassis.

W. C. & H. N. Allen, New York City—Five four-cylinder, pair-cast, Metallurgique cars; one each seven-passenger touring car, roadster and landaulet and two limousines.

De Dion Bouton Selling Branch, New York City—Seven De Dion Bouton cars; two four-cylinder coupes, one each four-cylinder six-passenger touring car and limousine, two eight-cylinder, seven-passenger touring cars, one eight-cylinder limousine, and three eight-cylinder chassis.

Distributing & Importing Co., New York City—Four four-cylinder, pair-cast, Mercedes cars; one each seven-passenger touring car and landaulet and two limousines and one four-cylinder racing car.

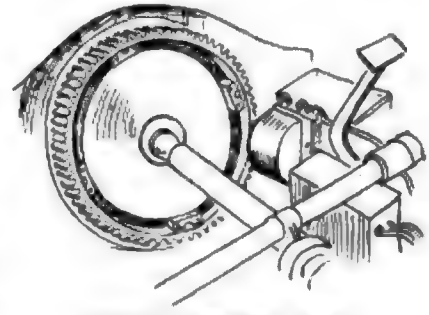
Healy & Co., New York City—Three four-cylinder Austrian Daimler cars; one roadster with individually cast cylinders, one limousine with pair-cast cylinders, and a seven-passenger touring car with a block-cast motor. Bodies Healy built.

Holbrook Co., New York City—Limousine and coupe bodies mounted on Minerva chassis and a coupe mounted on a Lancia chassis.

Isotta-Fraschini Motor Co., New York City—Five four-cylinder, block-cast, Isotta-Fraschini cars; one each seven-passenger touring car, coupe and limousine, and two landaulets, and three four-cylinder chassis.

Keeton Motor Co., Ltd., Brantford, Canada—One six-cylinder, seven-passenger Canadian Keeton touring car and one six-cylinder chassis; both with block-cast motors.

Locke & Co., New York City—Seven-pas-



RENAULT STARTER GEAR

senger touring car and coupe bodies, both mounted on Renault chassis.

Panhard & Levassor Selling Branch, New York City—Three four-cylinder, Knight-engined Panhard cars; one each landaulet with separate cast cylinders, seven-passenger touring car and limousine with pair-cast cylinders and two four-cylinder Knight-engined chassis with separate and pair-cast cylinders, respectively.

J. M. Quinby & Co., Newark, N. J.—Seven-passenger touring car and landaulet bodies mounted on Minerva chassis and one coupe and one landaulet body mounted on Renault and Isotta-Fraschini chassis.

Renault Freres Selling Branch, New York City—Four four-cylinder Renault cars; one each seven-passenger touring car, coupe, limousine and landaulet; one six-cylinder, seven-passenger touring car and one each four-cylinder and six-cylinder chassis. Cylinders on fours and sixes cast in pairs and threes, respectively.

F. W. Sewell, New York City—Six four-cylinder, Knight-engined Minerva cars; one each coupe, landaulet and Berlin and three limousines.

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MAKING SHOW WINDOW IMPRESS PUBLIC'S EYE

One-article Display as One Means of Causing Some One Part of Store's Stock to be Remembered—Method Employed by Denver Accessory Dealer During Christmas Season.



ATTRACTIVE YULETIDE SHOW WINDOW DRESSING CENTERING ABOUT A SINGLE ACCESSORY—KLAXON HORNS

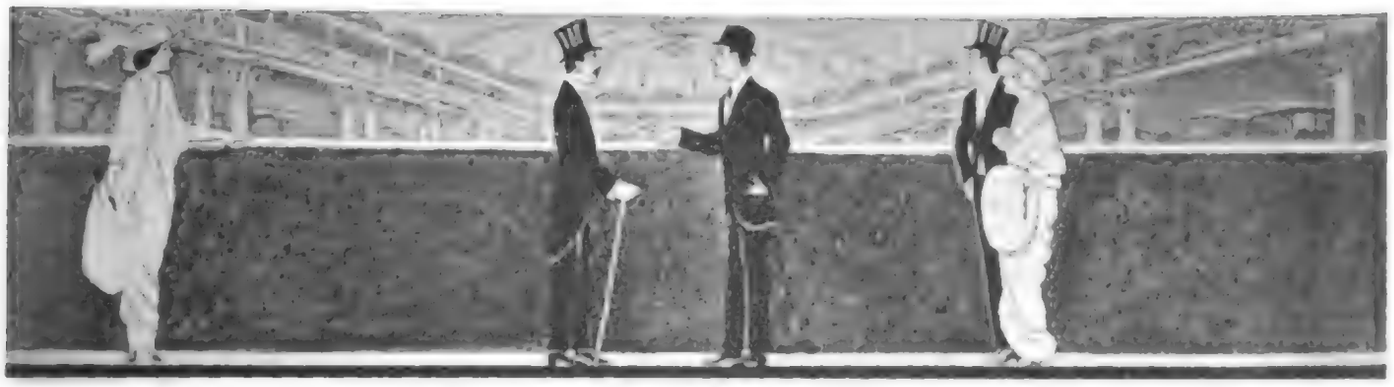
How to fix in the mind of the observer the fact that he has seen something in a show window and how to have him carry away in his memory a picture of some article which he may need, is a problem which window dressers have made the subject of long study and, as a result, many and varied have been the methods evolved; one of these, designed to fix some one object in the brain cells of the man who stops to look, or passes by without stopping but nevertheless looks, is the one-article window in which the display is built up of some one piece of stock. This, to be effective, requires a little decorative skill, and oftentimes the merchant who thinks he is not cut out for a window trimmer will surprise himself once he tries out his ability.

What one accessory dealer accomplished in the one-article line is shown by the accompanying photograph of the store front of the Fry & McGill Motor Supply Co., of 16th street and Broadway, Denver, Col. This company chose Klaxon horns as the article and to give a Christmas setting three evergreen trees, which are not scarce about Denver, a little cotton batting, some Christmas tree decorations and the horns were the principal necessities in the design.

Like every good Yuletide exhibit, there was snow; this was the cotton with a glittering covering on the floor of the window.

The trees, the largest in the center, were fixed in place at the back of the window and the horns were arranged thereon; the larger horns found suitable places nearest the bottoms of the trees and the Klaxets were fixed on the upper part, while in the "snow" lay other horns, the black and brass standing out in contrast against the white of the cotton and the green of the trees. Klaxon cards, a company banner, a picture of an aeroplane on the side wall and electric lights to show things up at night were the remainder of the design.

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DOORS OF NEW YORK'S TWIN SHOW ALMOST AJAR

Madison Square Garden and Grand Central Palace Made Ready for "13th Annual"—Surprises Developed Since Motor World's Mammoth Before-Shows Number—Wealth of Cars and Accessories to be Displayed.

When the doors of Madison Square Garden—in which goodby tears were shed last year—and Grand Central Palace are opened on Saturday night, 11th inst., it will be on such an automobile show as never was before; it will be a twin show, so to speak. Nearly 500 separate exhibits will be set out for the wondering gaze of the thousands who will pass the portals of the two buildings to view them: In the Garden, some 43 automobile manufacturers and 272 makers of accessories will hold forth; in the Palace, there will be 46 makes of pleasure cars and more than 100 accessory exhibits, to say nothing of the 20 motorcycle exhibits.

Until Saturday night, 18th inst., pleasure car manufacturers and makers of accessories will occupy the boards in both buildings, when a quick shift will be made and the pleasure cars will make way for the more ponderous though scarcely less interesting commercial vehicles, which will continue the "run" for another week, or from the 20th to the 25th. With comparatively few exceptions, accessory makers who have taken space for the first week will remain for the second.

Two Shows for the One Admission.

Despite the fact that the show is held in both buildings, and that nearly a mile separates them, a single admission ticket—50 cents, please—will admit to the "whole show." That is to say, it will admit nearly always. On Tuesday and Thursday, 16th and 18th insts., the tax has been raised to $1, ostensibly to reduce the crush slightly that members of the "400" may view the exhibits in comparative comfort. As is usual, these two days have been styled "society days," though it is doubtful, in view of past experience, whether either the designation or the increase in the price of the ticket will operate to keep very many persons away.

Already the work of practically reconstructing and decorating and otherwise metamorphizing the Garden has been completed, and when the ticket choppers commence to chop tickets on Saturday night on the inside of the big building there will be mirrors—mirrors everywhere, that will reflect the myriad electric lights, the statuary and the remainder of the decorative scheme that will prevail.

Thousand Men at Work on Garden.

All of which requires an immense amount of labor, of course. Just how much it does require may be gathered from the information that no less than 800 men are now working in night and day shifts to get the Garden ready for its host; altogether there are some 1,200 persons employed in making ready for the opening night. Some of them are building the clever network of steel cables and girders that will support the temporary balconies, which, as was the case last year, will encircle the big amphitheater. Two hundred tons of steel is a whole lot of steel, but it is none too much for the purpose. Others are cunningly covering the steel work with the veneer of color and "effect" that is to hide the reality of the structure and make of it a veritable fair garden, or, as those who have the decorating in hand term it, a "Crystal Palace."

Landscape Artists Beautify Palace.

Uptown further, at Grand Central Palace, which is just about a mile from the Garden, although the exhibits it houses are part and parcel of the one big show in the two buildings, which is proven by the fact that one ticket will admit to both buildings, if by nothing else, there is evident very nearly, but not quite, so much activity. The Palace is new and it does not require the "fixing" required by the Garden, although it will be none the less resplendent. There won't be any Louis "the cans" effect, nor yet will it be Louis "the quince," as it has been mispronounced by some. It will be just a good old American effect, and it will be obtained with the aid of a corps of landscape artists whose names are a power. Alec. Grinager, the noted Norwegian artist; Walter Burridge, the scenic artist whose fame has spread further than New York City; Walter Shaffner—all these men have contributed to make of the walls of the Palace a veritable picture gallery.

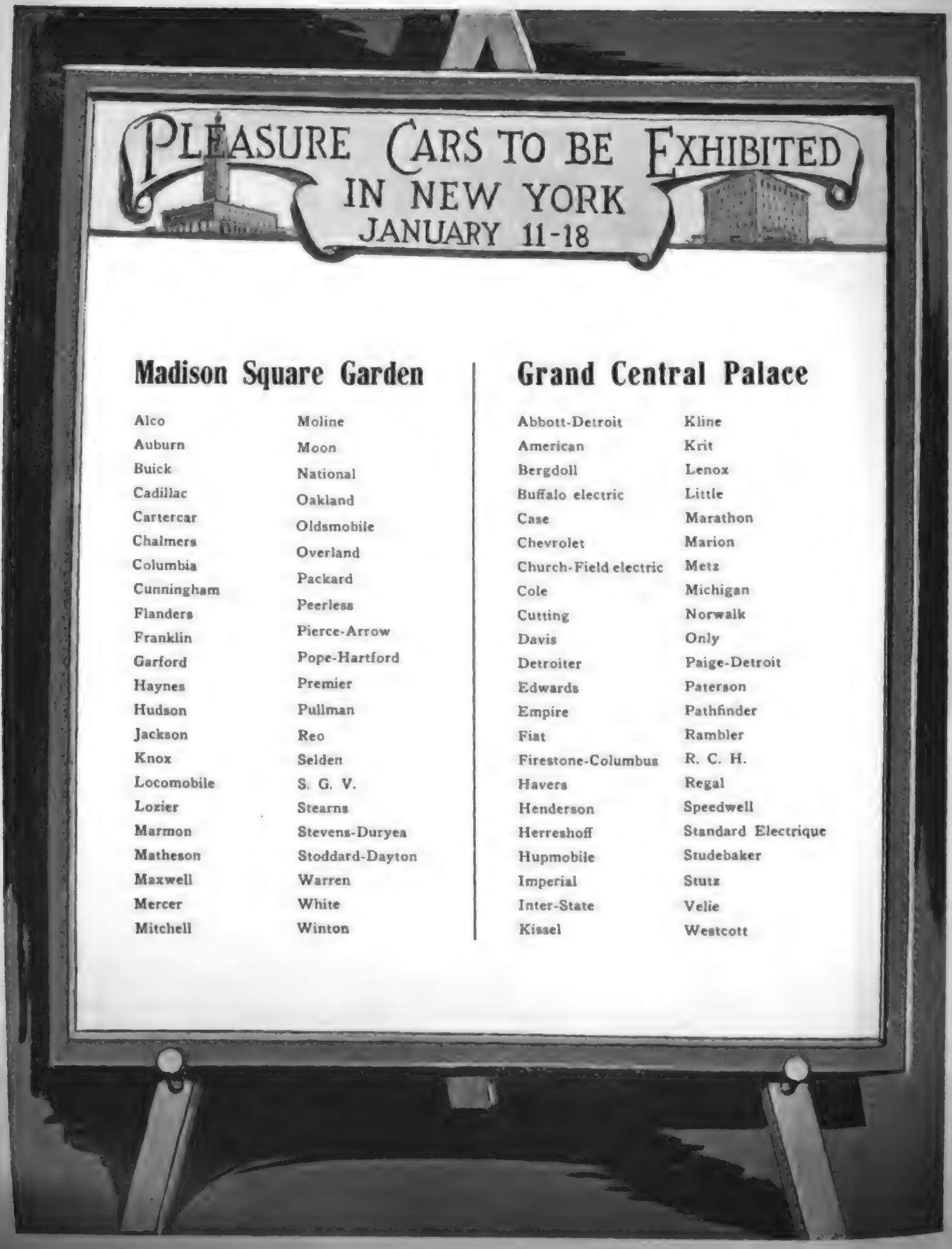
Natural Growths Part of Scheme.

Probably no person who visits an automobile show merely to look has any idea of the tremendous amount of work that is necessary in preparing for the occasion, though those who revel in statistics may take small comfort in the knowledge that in the Palace more than 18,000 feet of natural vines will be needed to cover the lattice work; 9,000 poinsetta blooms will blossom on the vines; and some 500 large branches of live oak, specially treated to make them fireproof, have been brought up from the sunny South to help out the decorative scheme. One hundred and fifty men will do the work, and, last but not least, 100 expert carpet layers will stretch the floor coverings, aggregating some 12,000 square feet, just before the doors are opened.

Shows of the Past and Present.

What a contrast between the coming show and the shows of yesteryear! To those who have memories that stretch back

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Madison Square Garden

Alco
Auburn
Buick
Cadillac
Cartercar
Chalmers
Columbia
Cunningham
Flanders
Franklin
Garford
Haynes
Hudson
Jackson
Knox
Locomobile
Lozier
Marmon
Matheson
Maxwell
Mercer
Mitchell
Moline
Moon
National
Oakland
Oldsmobile
Overland
Packard
Peerless
Pierce-Arrow
Pope-Hartford
Premier
Pullman
Reo
Selden
S. G. V.
Stearns
Stevens-Duryea
Stoddard-Dayton
Warren
White
Winton

Grand Central Palace

Abbott-Detroit
American
Bergdoll
Buffalo electric
Case
Chevrolet
Church-Field electric
Cole
Cutting
Davis
Detroiter
Edwards
Empire
Fiat
Firestone-Columbus
Havers
Henderson
Herreshoff
Hupmobile
Imperial
Inter-State
Kissel
Kline
Krit
Lenox
Little
Marathon
Marion
Metz
Michigan
Norwalk
Only
Paige-Detroit
Paterson
Pathfinder
Rambler
R. C. H.
Regal
Speedwell
Standard Electrique
Studebaker
Stutz
Velie
Westcott

far enough, there will be visible a small corner in the basement of Madison Square Garden in which there were huddled three makes of "horseless carriages." The year was 1899, and the occasion was the annual bicycle show. Those three makes of automobiles, which have proven the nucleus of the present tremendous shows, were the Pope, the Oakman and the Riker electric. Of them all, the Pope is the only one that has survived the intervening years, though those who knew only the first Pope would be unable to recognize its successor.

Show of 1900 First of Moment.

Few paid much attention to "horseless carriages" in those days, except as curiosities, and it was not until the following year—1900—that the automobile industry had made such strides as to make it more than ordinarily apparent. At the show in Madison Square Garden that year, 33 automobile manufacturers exhibited cars and 24 accessory makers occupied intervening spaces and the balcony. That is to say, they occupied part of the balcony. Of course, 57 exhibits filled not more than a small part of the amount of available space, and it was as much to fill the remaining space as for any other reason that the center of the Garden was occupied in part by a small oval track which served to demonstrate the cars.

Test Hill that Tried Out Cars.

Another of the curious and almost forgotten features of one of the earlier shows was the "test hill" that was erected on the roof of the Garden. In those days it was quite a task for many of the cars to climb even a moderately steep grade, and as a result the hill-climbing ability of a car constituted for a time a comparative measure of its worth in the eyes of the purchaser. The "test hill" was narrow and was constructed of boards, the arrangement being shown by the accompanying picture.

Advance Rapid in Last Twelve Years.

From 1900 up to date the march of the automobile has been triumphant, as is indicated by the statistics of the shows that intervene: In 1901, there were 41 automobile and 76 accessory exhibits; in 1903, the 1902 show having been set forward six weeks from November 1902, there were 60 car exhibits, the accessory exhibits remaining practically stationary; in 1904, the number of cars exhibited rose to 64, nearly all of which were gasolene, thus marking the demise of the steam car, which up to that time had held up its head fairly well. From then up to 1911, which saw the inauguration of the "two weeks" shows, at which the first week was devoted to pleasure vehicles and the second to commercials, the number of manufacturers represented steadily has increased, until, with the opening of the doors of the Garden and the Palace on Saturday night, 89 automobile manufacturers will be represented. And all this from a beginning in the basement of the Garden as a "side show" to an exhibition of bicycles!

As to what will be new at the forthcoming shows, that, as Kipling says, is quite another story. It is a long story—a very long one—that already has been told with a thoroughness and a minuteness never before attempted or accomplished, in the 400-page "Before Shows" issue of Motor World that bore date of December 26. Still, to quote an old saw that is none the less trite for its age, "A good tale bears telling twice," and besides, there invariably is a number of "last minute" developments and surprises that have been held up commodious sleeves to be sprung with the opening of the doors of the shows.

Exhibits' Distinguishing Features.

The show will simply serve to make clearer the already well-defined tendencies that were pointed out in the "Before Shows Issue" of Motor World, than which no show forecast ever was more complete. "Greater value" is the expression which best describes the cars as a whole, though specifically the more pronounced leanings will be found in the increase in the number of "sixes" and limousines, the fullness of equipment, the widespread adoption of electric lighting and engine starting systems, the tendency toward long stroke block cast motors, the increasing popularity of wire wheels, the longer springs and larger tires and demountable rims, the longer wheelbases, the increase in the number of cars equipped with left steer and center control, the generally deeper upholstery, the V-type radiators and clean running boards, the cowl dashboards and gasolene tanks, the dirt-proof construction and the improvement in lubrication systems, the generally greater quietness of motors and mechanisms in the accomplishment of which the adoption of "silent" chain camshaft drives and worm driven magnetos has played an important part.

Rotary Valve Motor in Speedwell.

Not the least important of the "surprises" that are held in readiness to be sprung, is the formal display of the Mead rotary valve engine in a stock model by a recognized manufacturer of repute which heretofore has confined its efforts to the production of poppet valve engines—the Speedwell Motor Car Co., of Dayton, O. However, that is only half the surprise; the other half is that the Mead engine with which at least one of the new Speedwell models will be equipped is a "six." The Mead engine, be

NEW "SIXES"

which will make their first appearance at the

NEW YORK SHOW

Between $1,000 and $2,000	
LITTLE	$1,285
KRIT (about)	1,300
STUDEBAKER	1,550
FLANDERS	1,550
HERRESHOFF	1,700
MITCHELL	1,850
HAVERS	1,850
Between $2,000 and $3,000	
CHEVROLET	$2,100
AUBURN	2,150
HAVERS	2,250
STUTZ	2,300
OAKLAND	2,400
HUDSON	2,450
COLE	2,485
WARREN	2,500
MITCHELL	2,500
IMPERIAL	2,500
PREMIER	2,600
INTER-STATE	2,750
LENOX	2,750
GARFORD	2,750
FRANKLIN	2,800
SPEEDWELL	2,850
SPEEDWELL-MEAD	——
Between $3,000 and $4,000	
NORWALK	3,100
OLDSMOBILE	3,200
LOZIER	3,250
Between $4,000 and $5,000	
PACKARD	4,150
KNOX	4,500
STEVENS-DURYEA	4,500
STEARNS-KNIGHT	4,850
MARMON	5,000

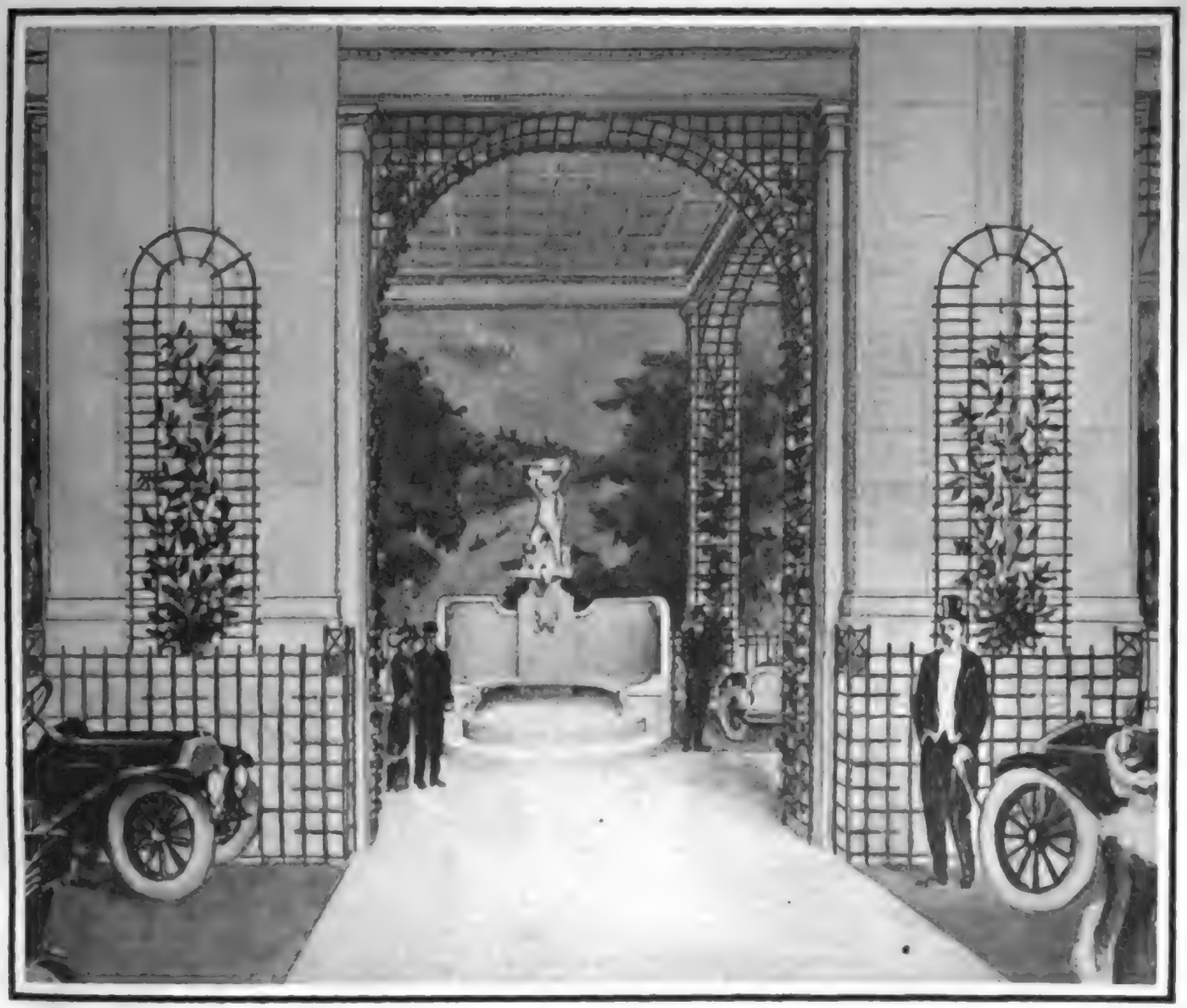
NEW "FOURS"

Less Than $1,000	
METZ	$395
LITTLE	690
MAXWELL	785
DETROITER	850
STUDEBAKER	885
DETROITER	900
EMPIRE	950
Between $1,000 and $1,500	
OAKLAND	1,075
ONLY	1,250
PAIGE-DETROIT	1,275
STUDEBAKER	1,290
HENDERSON	1,385
MITCHELL	1,500
Between $1,500 and $2,000	
MICHIGAN	1,585
ABBOTT-DETROIT	1,700
HAYNES	1,785
BERGDOLL	2,000
More Than $2,000	
POPE-HARTFORD	2,250
EDWARDS-KNIGHT	3,500
FIAT	4,500

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PERSPECTIVE VIEW OF MADISON SQUARE GARDEN AS IT WILL APPEAR FOR THE OPENING, SATURDAY NIGHT



SECTION OF THE DECORATIVE SCHEME FOR THE PALACE SHOWING LATTICE WORK AND A ROMAN EXEDRA

it remembered, first was formally introduced at the June, 1911, meeting of the Society of Automobile Engineers held in Dayton, at which time a long paper describing it was read before the society and the engine itself was demonstrated. Since then it has been refined in minor details and subjected to rigorous testing, though it retains all of its original characteristics. Its valves, for which it is primarily distinctive, are long, cylindrical members mounted in longitudinal pockets near the cylinder heads and driven by spiral gearing, one member opening and closing all the exhaust ports in proper rotation and one member serving the same purpose on the intake side. Incidentally, a new six-cylinder Speedwell poppet valve motor has been added to the Speedwell line, the chassis for either the Mead engine or the poppet valve engine being identical.

Another of the surprises that will be sprung is a new Jackson model styled "The Duck" and described best as four cars in one. It is unusual in that it is driven from what is usually considered to be the tonneau, seats being arranged at the back, beside the steering wheel and in front of it.

"Sixes" that Show for First Time.

To the long list of new "sixes" that are exhibited for the first time—the Flanders, the Studebaker, the Havers, the Lenox, the Cole, Crow, Herreshoff, Hudson, Marmon, Stearns-Knight, Stutz, Warren, Little, Chevrolet, Premier, Packard, Knox, Franklin, Lozier, Kissel, Firestone-Columbus, McIntyre, Garford, and others—there has been added another, though it still is shrouded in much mystery. It is the Krit, and little is known about it except that it is hinted it will sell for close to $1,300, thus marking another addition to the class of low-priced "sixes" that has sprung into such prominence within the past twelvemonth.

Of new "fours" there also is a representative list, some of them—as, for instance, the Oakland, Abbott-Detroit, Bergdoll, Case, Fiat, and Haynes—being brothers to older models and therefore reflecting many of their birthmarks, and some of them being brand new all the way through and therefore making their first formal appearance. Among the latter are the Little and the Henderson, the Detroiter and the Paige and the Edwards, the latter being a Knight-engined car that incorporates an unusually large number of distinctive features.

In several instances, prominent among which are Studebaker, Michigan and Mitchell, whole lines have been virtually reconstructed, root and branch, and in the products that are to be placed on view there will be found very little by which to recognize the new cars as the successors of older

GENERAL VIEW OF GRAND CENTRAL PALACE AS IT WILL BE DRESSED FOR THE SHOW

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ones. In both cases, the reconstruction has been drastic and gives evidence of well-directed efforts to supplant older models with new ones in which the last word in automobile construction has been incorporated. Other lines, of course, have been more or less reconstructed, though in no case has the metamorphosis been as complete as it has in these two.

Among the cars that continue year in and year out with scarcely a change worthy of an adjective more qualifying than minor, there are the Alco and the American, the Buick and the Chalmers, the Winton and the White, the Locomobile and the Pope-Hartford, and the other four "P's"—the Pierce-Arrow, the Peerless, the Packard, and the Premier—the Cunningham, the Fiat, the Knox, the Kline, and the Kissel. They will all be there—the roll is very nearly complete.

Altogether there will be just seven brands of cars exhibited in New York that failed to put in an appearance at either of the New York shows last year, though some of them were exhibited in Chicago. The list of seven includes the Cunningham, the Davis, the Lenox, which last year was shown only in its home town, which is Boston; the Marathon, the Norwalk, and the Pathfinder. The last one, which is the Only, is exhibited for the first time in its new form with a four-cylinder motor—it has the longest stroke of any on exhibition, by the way. At its last appearance in New York it had a single cylinder motor, for which great claims were made and which was chiefly conspicuous by reason of its exceptionally long stroke.

Electric cars will be comparatively scarce at the New York shows, only three makes being scheduled to appear. Of them, the Standard is the only one that has appeared at a show in New York before, with the possible exception of the Buffalo, which was shown for the first time at the recent electrical show in Grand Central Palace; this is the first time it has appeared at a real automobile show, however. The third of the trio is the radical Church-Field, which was placed on the market almost simultaneously with the last shows, though it found a place in neither of them. It is "gasolenish," even to the use of a planetary gearset.

New Things in Parts and Accessories.

In the realm of accessories and parts, it goes without saying that there will be a great deal that is new and interesting. Electrical equipment, embraced by the phrase "electric lighting and engine starting systems," of course will be prominent—few things will be more prominent, either as a development of the cars on view themselves or as accessories. Tires and rims quite naturally have come in for improvement, though the most noticeable alteration to the purely casual observer quite likely will be the great increase in variety of non-skid treads. In artillery wheels there has been little change, for the good and sufficient reason that there remains little chance for improvement. Wire wheels, however, rapidly are coming to the fore, and there is a new steel wheel for commercial vehicles from the Sheldon factories. Sheldon also is responsible for a new worm drive axle, as also is the Timken-Detroit Axle Co.

As heretofore, ignition apparatus in general has been considerably improved in the past twelvemonth, though there is little that is brand new in conception. There are a number of new spark plugs of the priming type, and in the realm of spark producers the Hi-Fre-Co. system is exhibited for the first time. Added impetus also has been given single spark systems, new systems of the kind having been brought out by both the New York Spark Coil Co. and the Atwater Kent company. In the realm of signalling devices, there are several new horns, among which there is the new "baby" Klaxon, which has been christened Klaxet; the "baby" Newtone; the Sparton, but recently brought out by the Sparks-Withington Co., and a new smaller edition of the hand-operated Long horn. Similarly, there is quite a little that is new in carburetters—the Motsinger, the Feps, the A. B. C. and others—the greatest tendency apparently being toward multiplication of jets. Speedometers have changed but little, except for a well-defined effort on the part of most manufacturers to increase the legibility of the dials. Both the Elyria-Dean and the Stewart, which incorporates a gradometer are new, though the former is virtually a refinement of the Forse instrument, manufacturing rights for which recently were acquired by the Dean Electric Co.

Summary of Cars to be Exhibited in New York, January 11-18

* Denotes Exhibit in Grand Central Palace; Without Such Notation, in Madison Square Garden.

Abbott Motor Co., Detroit, Mich.—Abbott-Detroit; fours; $1,700-$2,150.*

American Locomotive Co., Providence, R. I.—Alco; sixes; $6,000-$7,250.

American Motors Co., Indianapolis, Ind.—American; fours; $1,475-$6,000.*

Auburn Automobile Co., Auburn, Ind.—Auburn; fours and sixes; $1,250-$3,000.

Bergdoll Motor Co., Louis J., Philadelphia, Pa.—Bergdoll; fours; $1,600-$3,250.*

Briggs Detroiter Co., Detroit Mich.—Detroiter; fours; $850-$900.*

Buffalo Electric Vehicle Co., Buffalo, N. Y.—Buffalo electric; $2,600-$3,400.*

Buick Motor Co., Flint, Mich.—Buick; fours; $950-$1,650.

Cadillac Motor Car Co., Detroit, Mich.—Cadillac; fours; $1,975-$3,250.

Cartercar Co., Pontiac, Mich.—Cartercar; fours; $1,600-$2000.

Case Threshing Machine Co., J. I., Racine, Wis.—Case; fours; $1,435-$2,400.*

Chalmers Motor Co., Detroit, Mich.—Chalmers; sixes; $1,950-$3,700.

Church-Field Motor Co., Sibley, Mich.—Church-Field electric; $2,300-$2,800.*

Cole Motor Car Co., Indianapolis, Ind.—Cole; fours and sixes; $1,685-$3,750.*

Columbia Motor Car Co., Hartford, Conn.—Columbia; fours; $3,300-$5,900.

Columbus Buggy Co., Columbus, Ohio—Firestone-Columbus; fours and sixes; not quoted.*

Cunningham, Son & Co., James, Rochester, N. Y.—Cunningham; fours; $3,250-$4,600.

Cutting Motor Car Co., Jackson, Mich.—Cutting; fours; $1,475-$1,625.*

Davis Carriage Co., George W., Richmond, Ind.—Davis; fours; $2,000-$2,100.*

Dayton Motor Car Co., Dayton, Ohio—Stoddard-Dayton; fours and sixes; $1,350-$6,250.

Edwards Motor Car Co., New York City—Edwards-Knight; fours; $3,500-$4,700.*

Empire Automobile Co., Indianapolis, Ind.—Empire; fours; $950.*

F. I. A. T., Poughkeepsie, N. Y.—Fiat; fours and sixes; $4,000-$6,100.*

Flanders Motor Co., Detroit, Mich.—Flanders; sixes; $1,550-$2,250.

Franklin Mfg. Co., H. H., Syracuse, N. Y.—Franklin; fours and sixes; $1,650-$4,850.

Garford Co., Elyria, Ohio—Garford; sixes; $2,750-$3,750.

Havers Motor Car Co., Port Huron, Mich.—Havers; fours and sixes; $1,850-$2,250.*

Haynes Automobile Co., Kokomo, Ind.—Haynes; fours; $1,785-$3,500.

Henderson Motor Car Co., Indianapolis, Ind.—Henderson; fours; $1,285-$1,385.*

Herreshoff Motor Car Co., Detroit, Mich.—Herreshoff; fours and sixes; $1,250-$1,700.*

Hudson Motor Car Co., Detroit, Mich.—Hudson; fours and sixes; $1,875-$3,750.

Hupp Motor Car Co., Detroit, Mich.—Hupmobile; fours; $975-$1,350.*

Ideal Motor Car Co., Indianapolis, Ind.—Stutz; fours and sixes; $2,000-$2,300.*

Imperial Automobile Co., Jackson, Mich.—Imperial; four and sixes; $1,285-$2,500.*

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MADISON SQUARE GARDEN AS IT APPEARED FOR THE 1900 SHOW WITH ITS OVAL "DEMONSTRATING" TRACK

Inter-State Automobile Co., Munice, Ind.—Inter-State; fours and sixes; $2,400-$3,400.*

Jackson Automobile Co., Jackson, Mich.—Jackson; fours and sixes; $1,500-$2,650.

Jeffery Co., Thomas B., Kenosha, Wis.—Rambler; fours; $1,815-$2,825.*

Kissel Motor Car Co., Hartford, Wis.—Kissel; fours and sixes; $1,750-$4,900.*

Kline Motor Car Corporation, York, Pa.—Kline; fours and sixes; $1,750-$3,750.*

Knox Automobile Co., Springfield, Mass.—Knox; fours and sixes; $3,300-$6,450.

Krit Motor Car Co., Detroit, Mich.—Krit; fours and sixes; $900 (four).*

Lenox Motor Car Co., Inc., Boston, Mass.—Lenox; fours and sixes; $2,000-$4,050.*

Locomobile Co. of America, Bridgeport, Conn.—Locomobile; fours and sixes; $3,600-$6,100.

Lozier Motor Co., Detroit, Mich.—Lozier; sixes; $3,250-$6,500.

Marathon Motor Works, Nashville, Tenn.—Marathon; fours; $875-$1,800.*

Marion Motor Car Co., Indianapolis, Ind.—Marion; fours; $1,425-$1,850.*

Matheson Automobile Co., Wilkes-Barre, Pa.—Matheson; sixes; $3,750-$4,800.

Maxwell-Brisco Motor Co., Tarrytown, N. Y.—Maxwell; fours; $785-$1,675.

Mercer Automobile Co., Trenton, N. J.—Mercer; fours; $2,600-$2,900.

Metz Co., Waltham, Mass.—Metz; fours; $395.*

Michigan Motor Car Co., Kalamazoo, Mich.—Michigan; fours; $1,400-$1,585.*

Mitchell-Lewis Motor Co., Racine, Wis.—Mitchell; fours and sixes; $1,500-$2,500.

Moline Automobile Co., East Moline, Ill.—Moline; fours; $1,950.

Moon Motor Car Co., St. Louis, Mo.—Moon; fours; $1,650-$2,500.

Motor Car Mfg. Co., Indianapolis, Ind.—Pathfinder; fours; $2,000-$2,185.*

National Motor Vehicle Co., Indianapolis, Ind.—National; fours; $2,750-$3,400.

Nordyke & Marmon Co., Indianapolis, Ind.—Marmon; fours and sixes; $2,850-$6,450.

Norwalk Motor Car Co., Martinsburg, Va.—Norwalk; sixes; $2,750-$3,750.*

Oakland Motor Car Co., Pontiac, Mich.—Oakland; fours and sixes; $1,000-$3,000.

Olds Motor Works, Lansing, Mich.—Oldsmobile; sixes; $3,200-$3,350.

Only Motor Car Co., Port Jefferson, N. Y.—Only; fours; $1,000-$1,250.*

Packard Motor Car Co., Detroit, Mich.—Packard; sixes; $4,050-$6,050.

Paige-Detroit Motor Car Co., Detroit, Mich.—Paige-Detroit; fours; $1,000-$1,600.*

Paterson Co., W. A., Flint, Mich.—Paterson; fours; $1,500-$1,985.*

Peerless Motor Car Co., Cleveland, Ohio—Peerless; fours and sixes; $4,300-$7,200.

Pierce-Arrow Motor Car Co., Buffalo, N. Y.—Pierce-Arrow; sixes; $4,300-$7,300.

Pope Mfg. Co., Hartford, Conn.—Pope-Hartford; fours and sixes; $2,250-$5,550.

Premier Motor Mfg. Co., Indianapolis, Ind.—Premier; sixes; $2,600-$4,000.

Pullman Motor Car Co., York, Pa.—Pullman; fours and sixes; $1,875-$2,750.

R. C. H. Corp., Detroit, Mich.—R. C. H.; fours; $1,095-$1,600.

Regal Motor Car Co., Detroit, Mich.—Regal; fours; $900-$1,400.*

Reo Motor Car Co., Lansing, Mich.—Reo; fours; $1,000-$1,750.

Republic Motor Co. of New York, New York City—Little; fours and sixes; $690-$1,285. Chevrolet; sixes; $2,100.*

Selden Motor Vehicle Co., Rochester, N. Y.—Selden; fours; $2,500-$3,750.

S. G. V. Co., Reading, Pa.—S. G. V.; fours; $2,500-$4,000.

Speedwell Motor Car Co., Dayton, Ohio—Speedwell; sixes; $2,850-$2,950.*

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THE "TEST HILL" THAT WAS ERECTED ON THE ROOF OF THE GARDEN AT ONE OF THE FIRST SHOWS

Standard Electric Car Co., Jackson, Mich.—Standard Electricque; $1,885.*

Stearns Co., F. B., Cleveland, Ohio—Stearns-Knight; fours and sixes; $3,750-$6,200.

Stevens-Duryea Co., Chicopee Falls, Mass.—Stevens-Duryea; sixes; $4,500-$5,950.

Studebaker Corp., Detroit, Mich.—Studebaker; fours and sixes; $885-$2,500.*

Velie Motor Vehicle Co., Moline, Ill.—Velie; fours; $1,350-$3,400.*

Warren Motor Car Co., Detroit, Mich.—Warren; fours and sixes; $1,800-$2,500.

Westcott Motor Car Co., Richmond, Ind.—Westcott; fours and sixes; $1,975-$2,475.*

White Co., Cleveland, Ohio—White; fours and sixes; $2,500-$6,300.

Willys-Overland Co., Toledo, Ohio; fours; $985-$1,500.

Winton Motor Carriage Co., Cleveland, Ohio; sixes; $3,000-$4,500.

Summary of Accessories to be Exhibited in New York, January 11-25

* Denotes Exhibit in Grand Central Palace; without such notation, in Madison Square Garden.

Adams & Westlake Co., Chicago, Ill.—Adlake electric lighting system.

Ajax Trunk and Sample Case Co., New York City—Trunks and bags.

Ajax-Grieb Rubber Co., New York City—Ajax tires.

Allen Wrench & Tool Co., Providence, R. I.—Allen friction wrenches.

Alexander Mfg. Co., J., New York City—Jaco electric signals, mirrors and brass fittings.*

American Ball Bearing Co., Cleveland, Ohio—American axles and worm gearing.

American Bronze Co., Berwyn, Pa.—Non-Gran bearing metal.

American Hardware Corp., New Britain, Conn.—Corbin-Brown speedometers.*

American Metal Hose Co., Waterbury, Conn.—Flexible metal exhaust pipe, pump and lamp connections.*

American Kushion Kore Tire Co., New York City—Tire filler.

American Tire & Rubber Co., Akron, Ohio—American inner tubes.*

American Tank & Pump Co., New York City—American fuel pumps and storage systems.

American Taximeter Co., New York City—Jones and Popp taximeters and Speedograph truck recorders.

Arnold, N. B., Brooklyn, N. Y.—Slickup cleaning specialties.

Asbestos & Rubber Works of America, Brooklyn, N. Y.—Motobestos and Ajax brake linings.

Ashley, James, New York City—Portable garages.

Auburn Auto Pump Co., Boston, Mass.—Ten Eyck tire pumps.

Automobile Supply Mfg. Co., Brooklyn, N. Y.—Newtone signals and Rubes horns.

Aristos Co., New York City—Magic motors and transmissions, Mondex shock absorbers and Mondex-Helix mixers.

Badger Brass Mfg. Co., Kenosha, Wis.—Solar lamps.

B. & L. Auto Lamp Co., New York City—B. & L. lamps and fittings.

Baldwin Chain & Mfg. Co., Worcester, Mass.—Baldwin chains.

Baldwin Steel Co., New York City—Baldwin steels.

Baker Rim Co., New York City—Baker rims.

Barthel, Daly & Miller, New York City—Schaefer ball bearings.

Baums Castorine Co., Rome, N. Y.—Body soaps.*

Batavia Rubber Co., Batavia, N. Y.—Batavia tires.

Benford Mfg. Co., Mt. Vernon, N. Y.—Monarch plugs and headlight lighters.

Berg Auto Trunk & Specialty Co., New York City—Berg trunks and carriers.

Bijur Motor Lighting Co., New York City—Bijur starting and lighting systems.

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Blackledge Mfg. Co., John W., Chicago, Ill.—Velvet auxiliary springs.

Borne-Scrymser Co., New York City—Colonial and Silex lubricants.

Bower Roller Bearing Co., Detroit, Mich.—Bower roller bearings.

Bowser & Co., S. F., Ft. Wayne, Ind.—Fuel pumps and storage systems.

Braender Rubber & Tire Co., Rutherford, N. J.—Braender tires.

Briggs Magneto Co., Elkhart, Ind.—Briggs magnetos.

Brown Co., Syracuse, N. Y.—B'Co. pumps and specialties.

Brown-Lipe Gear Co., Syracuse, N. Y.—Brown-Lipe gears and gearsets.

Buda Co., Harvey, Ill.—Buda motors and gearsets.*

Budd Mfg. Co., Edward G., Philadelphia, Pa.—Pressed steel bodies.

Burke Valve Co., Cleveland, Ohio—Valves and fittings.

Byrne, Kingston & Co., Kokomo, Ind.—Kingston carburetters.

Carnegie Steel Co., Pittsburg, Pa.—Steels.

Carpenter Steel Co., Reading, Pa.—Steels.

Carron & Co., New York City—Electrically warmed gloves.*

Champion Ignition Co., Flint, Mich.—A-C spark plugs.

Chicago Drop Forge & Foundry Co., Chicago, Ill.—Drop forgings.

Chase & Co., L. C., Boston, Mass.—Top fabrics.

Cleveland Worm & Gear Co., Cleveland, Ohio—Worm gears.*

Clucker & Hickson, New York City—Sundries.

Cleveland Hardware Co., Cleveland, Ohio—Drop forgings.

Coes Wrench Co., Worcester, Mass.—Wrenches.

Columbia Nut & Bolt Co., Bridgeport, Conn.—Lock nuts and bolts.

Columbia Lubricants Co., New York City—Monogram lubricants.

Connecticut Telephone & Electric Co., Meriden, Conn.—Connecticut shock absorbers, magnetos and ignition devices.

Consolidated Rubber Tire Co., New York City—Kelly-Springfield tires.

Continental Rubber Works Co., Erie, Pa.—Continental tires.*

Cooks Sons, Adam, New York City—Albany grease and lubricating oils.

Cotta Transmission Co., Rockford, Ill.—Gearsets.

Cox Brass Mfg. Co., Albany, N. Y.—Clear Vision windshields.

Cowles & Co., C., New Haven, Conn.—Lamps, heaters and body fittings.

Cramp & Sons Ship & Engine Bldg. Co., Wm., Philadelphia, Pa.—Parsons's white brass and bronze bearing metals, bearings and worm gears.*

Cross & Co., C. J., Boston, Mass.—Top and cover fabrics.*

C. R. G. Mfg. Co., Saugus, Mass.—C. R. G. carburetters.

Dayton Rubber Mfg. Co., Dayton, Ohio—Dayton Airless tires.

Daniels, Smalley, Detroit, Mich.—Sundries.

Dean Electric Co., Elyria, Ohio—Tuto and Rexo signals, Dynalux electric lighting systems, Otho and Elyria-Dean electric lighting and starting systems, Elyria-Dean speedometers, Hi-Fre-Co ignition systems.*

Diamond Chain & Mfg. Co., Indianapolis, Ind.—Diamond chains.

Detroit Electric Appliance Co., Detroit, Mich.—Deaco electric lighting systems.

Diamond Rubber Co., Akron, Ohio—Diamond tires.

Dixon Crucible Co., Jos., Jersey City, N. J.—Graphite lubricants.

Doehler Die Casting Co., Brooklyn, N. Y.—Die cast parts.

Donnelly Motor Equipment Co., New York City—National tire pumps and vulcanizers and sundries.

Double Fabric Tire Co., Auburn, Ind.—Tires and inner tubes.

Dover Stamping & Mfg. Co., Cambridge, Mass.—Drip pans, funnels and sheet metal goods.

Driggs-Seabury Ordnance Co., Sharon, Pa.—Axles, gearsets, frames and assemblies.

Dykes Co., John L., Chicago, Ill.—Tire protectors.

Eavenson Sons, Inc., J., Camden, N. J.—Soaps and polishes.*

Edison Storage Battery Co., West Orange, N. J.—Edison storage batteries and rectifiers.

Eclipse Machine Co., Elmira, N. Y.—Motorcycle fittings.*

Edmunds & Jones Mfg. Co., Detroit, Mich.—Lamps.

Electric Auto Lite Co., Toledo, Ohio—Auto Lite lighting systems.

Electric Storage Battery Co., Philadelphia, Pa.—Exide storage batteries.

Elliot, H. A., Detroit, Mich.—Forged parts, Derhion and Bishoff steels.

Empire Tire Co., Trenton, N. J.—Empire tires.

Endurance Tire & Rubber Co., New York City—Endurance red inner tubes.

Englebert Tire Co., New York City—Tires.

English & Mersick Co., New Haven, Conn.—Metal trimmings.

Esterline Co., Lafayette, Ind.—Berdon electric lighting and starting system.*

Essex Rubber Co., Trenton, N. J.—Rubber sundries.

Eureka Non-Skid Mfg. Co., Brooklyn, N. Y.—Anti-skidding devices.*

Faw, F. W., New York City—Gaskets, blowout patches, reliners and sundries.

Favary Tire & Cushion Co., New York City—Favary cushion tires.

Federal Chain & Mfg. Co., Springfield, Mass.—Federal chains.

Findeisen & Kropf Mfg. Co., Chicago, Ill.—Rayfield carburetters.

Federal Rubber Mfg. Co., Milwaukee, Wis.—Federal tires.

Fisher Steel & Iron Works Co., Switzerland—Steels.

Firestone Tire & Rubber Co., Akron, Ohio—Firestone tires.

Fisk Rubber Co., Chicopee Falls, Mass.—Fisk tires.

Flentje, Ernest, Cambridge, Mass.—Flentje recoil checks.*

Fletcher & Co., L. V., New York City—American Locomotive carburetters.

Flex-O-Fill Core Co., New York City—Tire fillers.

Franklin Mfg. Co., H. H., Syracuse, N. Y.—Die cast parts.

G. & J. Tire Co., Indianapolis, Ind.—United States tires.

Gabriel Horn Mfg. Co., Cleveland, Ohio—Gabriel horns and rebound snubbers.

Garage Equipment Co., Milwaukee, Wis.—Universal bumpers, tire holders, windshields, vulcanizers, jacks and lamps.

Gasolene Filter Co., New York City—Perfect gasolene filters.

Gemmer Mfg. Co., Detroit, Mich.—Gemmer steering gears.

General Rim Co., New York City—Rims.

Gilmer, G. W., Jr., Philadelphia, Pa.—Gilmer tire repair patches and tools.

Gibney Rubber Co., J. L., Philadelphia, Pa.—Tires and vulcanizers.

Globe Machine & Stamping Co., Cleveland, Ohio—Steel tool boxes, metal hampers, fenders and sheet metal parts.

Golde Patent Mfg. Co., New York City—Golde tops.

General Electric Co., Schenectady, N. Y.—Electric motors, rectifiers and apparatus and cloth pinions.*

Goodrich Co., B. F., Akron, Ohio—Goodrich tires.

Goodyear Tire & Rubber Co., Akron, Ohio—Goodyear tires.

Gould Storage Battery Co., New York City—Gould batteries.*

Gray Specialty Co., Newark, N. J.—Sundries.*

Grossman Co., Emil, New York City—Redhead spark plugs, E-G bumpers and sundries.

Gray & Davis, Amesbury, Mass.—Lamps and electric starting and lighting systems.*

Grip Nut Co., Chicago, Ill.—Lock nuts.

Harris Oil Co., A. W., Providence, R. I.—Lubricants.

Hagerstown Legging Co., Hagerstown, Pa.—Apparel.

Hartford Rubber Works Co., Hartford, Conn.—United States tires.

Hartford Suspension Co., Jersey City, N. J.—Truffault-Hartford shock absorbers, Hartford electric starting and lighting systems and jacks and bumpers.*

Hartford Machine Screw Co., Hartford, Conn.—Screw machine parts, spark plugs and tire pumps.

Haws, George A., New York City—Panhard lubricants.

Hawthorne Mfg. Co., Bridgeport, Conn.—Old Sol lamps.

Havoline Oil Co., New York City—Havoline lubricants.

Hayes Mfg. Co., Detroit, Mich.—Metal bodies, tool boxes, running boards and sheet metal parts.

Hess Steel Castings Co., Bridgeton, N. J.—Steel castings.*

Hess-Bright Mfg. Co., Philadelphia, Pa.—Hess-Bright ball bearings.

Hess Spring & Axle Co., Carthage, Ohio—Springs and axles.

Heinze Electric Co., Lowell, Mass.—Magnetos and coils.

Hoffecker Co., Boston, Mass.—Hoffecker Steady Hand speedometers.

Herz & Co., New York City—Herz magnetos, timers, spark plugs and ignition supplies.*

Hoffman Co., Geo. W., New York City—Metal polishes.*

Homo Co. of America, Philadelphia, Pa.—Homo carburetters.*

Houpert Machine Co., New York City—Motor parts, machine work, rotary motors.

Huston Multiple Car Springs Co., Philadelphia, Pa.—Springs.*

Hyatt Roller Bearing Co., Newark, N. J.—Hyatt flexible spiral steel roller bearings.

Ingersoll-Rand Co., New York City—Pumps.

Ignition Starter Co., Detroit, Mich.—Disco acetylene and electric starting and lighting systems.

International Acheson Graphite Co., Niagara Falls, N. Y.—Oildag and Gredag lubricants.

International Accessories Mfg. Co., New York City—A. B. C. carburetters.

International Metal Polish Co., New York City—Blue Ribbon polishes.

Janney-Steinmetz & Co., Philadelphia, Pa.—Cold drawn, seamless steel tanks.

J-M Shock Absorber Co., Philadelphia, Pa.—J-M shock absorbers.

Jeffery-Dewitt Co., Detroit, Mich.—Reliance and J-D Visible spark plugs.*

Jones & Co., Phineas, Newark, N. J.—Wood wheels.

Kahnweiler Sons, David, New York City—Simplex fire extinguishers.

Kellogg Mfg. Co., Rochester, N. Y.—Hand and power pumps and air engine starters.

Kent Mfg. Works, Atwater, Philadelphia, Pa.—Unisparker ignition systems and Monoplex horns.

Kells Mfg. Co., W. J., New York City—Radiators.

Kelly-Springfield Tire Co., New York City—Kelly-Springfield tires.

K-W Ignition Co., Cleveland, Ohio—K-W magnetos and coils.

Kokomo Electric Co., Kokomo, Ind.—Kingston magnetos, coils and timers.

Laidlaw, Jr., Wm. B., New York City—Top and cover fabrics

Leather Tire Goods Co., Niagara Falls, N. Y.—Woodworth tire treads, Kant Skid tire bands, repair boots, etc.

Leeds & Northrup Co., Philadelphia, Pa.*

Lee Tire & Rubber Co., Conshohocken, Pa.—Lee and Leeland tires and Waymaker exhaust horns.

Lefevre Arms Co., Syracuse, N. Y.—Gearsets.

Linde Shim Co., Brooklyn, N. Y.—Patent shims.

Light Mfg. & Foundry Co., Pottstown, Pa.—Aluminum parts and castings.

Link Belt Co., Philadelphia, Pa.—Silent chains.

Lovell-McConnell Mfg. Co., Newark, N. J.—Klaxon horns, Conover safeguards.

Marathon Tire & Rubber Co., Cuyahoga Falls, Ohio—Marathon tires.

Marburg Bros., Inc., New York City—Mea magnetos, S. R. O. bearings.

Manufacturers Foundry Co., Waterbury, Conn.—Castings.

Mayo Mfg. Co., Chicago, Ill.—Pumps and gauges.

McCord Mfg. Co., Detroit, Mich.—Radiators, lubricators, fans and McKim gaskets.

McCue Co., Buffalo, N. Y.—McCue axles and wire wheels.*

Merchant & Evans Co., Philadelphia, Pa.—Hele Shaw clutches, gearsets, Star tire cases.

Mezger, C. A., New York City—Sootproof spark plugs.

Metal Stamping Co., Long Island City, N. Y.—Stampings.

Michelin Tire Co., Milltown, N. J.—Tires.

Miller, Chas. E., New York City—Brampton chains, Miller spark plugs and spring lubricators, Pan American lubricants and sundries.*

Miller Rubber Co., Buffalo, N. Y.—Miller tires.

Morgan & Wright, Detroit, Mich.—United States tires.

Mosler & Co., A. R., Mt. Vernon, N. Y.—Spitfire spark plugs and Umph timers.

Mossberg, Frank, Attleboro, Mass.—Wrenches.

Motsinger Devices Mfg. Co., Pendleton, Ind.—Motsinger autosparkers and carburetters.

Motometer Co., New York City—Motometer temperature indicator.

Motor Car Equipment Co., Akron, Ohio—Supplies.

Motz Tire & Rubber Co., Akron, Ohio—Motz cushion tires.

Muncie Gear Works, Muncie, Ind.—Gears, wheels and gearsets.*

Mutty Co., L. J., Boston, Mass.—Upholstery materials.

Nathan Novelty Mfg. Co., New York City—Leather sundries.

National Coil Co., Lansing, Mich.—Spark coils.

National Motor Supply Co., Cleveland, O.—National pumps and vulcanizers.

National Rubber Co., St. Louis, Mo.—Tire preservative.*

National Tube Co., Pittsburgh, Pa.—Seamless steel tubing.

Never Skid Mfg. Co., New York City—Non-skid grips.*

New Departure Mfg. Co., Bristol, Conn.—New Departure ball bearings.*

New Jersey Car Spring & Rubber Co., Jersey City, N. J.—Carspring tires.

Newmastic Tire Co., New York City—Newmastic tire filler and demountable rims.*

New Miller Carburetter Co., Indianapolis, Ind.—New Miller carburetters.

New York Coil Co., New York City—Rhodes unit spark system.

New York & New Jersey Lubricants Co., New York City—Columbia lubricants.

Noera Mfg. Co., Waterbury, Conn.—Pumps and oil cans.

Norma Co. of America, New York City—Norma ball bearings.

North East Electric Co., Rochester, N. Y.—North East electric lighting and starting systems.

Northway Motor & Mfg. Co., Detroit, Mich.—Northway motors.

Nonpareil Horn Mfg. Co., New York City—Nonpareil bulb horns.

Oliver Mfg. Co., Chicago, Ill.—Oliver jacks.

Overman Tire Co., New York City—Overman tires.

Pantasote Co., New York City—Pantasote top and seat coverings.

Pennsylvania Rubber Co., Jeannette, Pa.—Pennsylvania tires.

Perfect Tire Sales Co., Philadelphia, Pa.—Tires.

Perfection Spring Co., Cleveland, Ohio—Krupp steel springs.

Perfecto Wind Deflector Co.,—Boston, Mass.—Windshields.

Philadelphia Storage Battery Co., Philadelphia, Pa.—Philadelphia batteries.*

Piel Co., G., Long Island City, N. Y.—Long horns and G-P muffler cut-outs.

Pioneer Steel & Block Tire Co., St. Louis, Mo.—Truck tires.

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Pittsburgh Model Engine Co., Pittsburgh, Pa.—Model motors.
Pittsfield Spark Coil Co., Pittsfield, Mass.—Ignition devices.
Polson Mfg. Co., Buffalo, N. Y.—Polson windshields.
Polack Tire Co., New York City—Polack tires.
Portage Rubber Co., Barberton, Ohio—Portage tires.
Prosser & Son, Thos., New York City—Krupp steels.
Pyrene Mfg. Co., New York City—Pyrene fire extinguishers.
Randall-Faichney Co., Boston, Mass.—Jericho and Jubilee exhaust horns, muffler cut-outs, B'Line grease guns, Jericho gas regulators, Webster tank gauges and other sundries.
Remy Electric Co., Anderson, Ind.—Remy magnetos and lighting systems.
Republic Rubber Co., Youngstown, Ohio—Republic tires.
Rich Tool Co., Chicago, Ill.—Tools.*
Rose Mfg. Co., Philadelphia, Pa.—Neverout lamps, license brackets, and heaters.
Rhineland Machine Works Co., New York City—Rhineland bearings.
Riley-Klotz Mfg. Co., Newark, N. J.—Bulb horns.
R. I. V. Co., New York City—R. I. V. ball bearings.*
Reilly & Son, Newark, N. J.—Trimming leathers.
Ross Gear & Tool Co., Lafayette, Ind.—Tools.*
Royal Equipment Co., Bridgeport, Conn.—Duplex and Raymond brakes, Raybestos brake linings, Gyrex mixers.
Roberts, H. T., Chicago, Ill.—Hecla carburetters, American rims.*
Russian Tire Sales Co., New York City—Prodwodnik tires.
Rushmore Dynamo Works, Plainfield, N. J.—Rushmore electric lighting and starting systems.
Sager Co., J. H., Rochester, N. Y.—Sager bumpers and supplementary springs.
Sarco Engineering Co., New York City—Coventry chains.
Schendler, Chas. A., Hoboken, N. J.—
S. B. R. Specialty Co., East Orange, N. J.—Sundries.
Schoen-Jackson Co., Media, Pa.—Feps carburetters.*
Schrader's Son, Inc., A., New York City—Universal tire valves and pressure gauges.*
Schwarz Wheel Co., Philadelphia, Pa.—Wood wheels.
Service Recorder Co., Chicago, Ill.—Truck recorders and hub odometers.
Seamless Rubber Co., New Haven, Conn.—Seamless tires and inner tubes.
Sewell Cushion Wheel Co., Detroit, Mich.—Cushion wheels.
Shaler Co., C. A., Waupun, Wis.—Shaler vulcanizers.
Sheldon Axle Co., Wilkesbarre, Pa.—Axles and springs.
Simms Magneto Co., New York City—Simms magnetos.*
S. K. F. Ball Bearing Co., New York City—S. K. F. ball bearings.
Smith Co., A. O., Milwaukee, Wis.—Parts.
Sonneborn Sons, Inc., L., New York City—Lubricants.
Spacke Mfg. Co., F. W., Indianapolis, Ind.—De Luxe motorcycle motors and parts.
Soss Mfg. Co., Brooklyn, N. Y.—Soss invisible hinges.*
Sparks-Withington Co., Jackson, Mich.—Fans and Sparton horns.
Spicer Mfg. Co., Plainfield, N. J.—Spicer universal joints.
Splitdorf Electrical Co., Newark, N. J.—Splitdorf magnetos, coils, plugs and other ignition devices, also electric lighting system.*
Standard Roller Bearing Co., Philadelphia, Pa.—Standard ball and roller bearings.
Standard Welding Co., Cleveland, Ohio—Stanweld rims, electrically welded tubing and parts.*
Standard Woven Fabric Co., Worcester, Mass.—Brake linings.*
Standard Thermometer Co., Boston, Mass.—Standard speedometers and Abell tire pumps.*
Stewart & Clark Mfg. Co., Chicago, Ill.—Stewart speedometers.
Stanley, J. T., New York City—Soaps and polishes.
Stevens & Co., New York City—Sundries.
Stromberg Motor Devices Co., Chicago, Ill.—Stromberg carburetters.
Suspension Roller Bearing Co., Sandusky, Ohio—Boyer suspension bearings.
Swinehart Tire & Rubber Co., Akron, Ohio—Swinehart tires.
Springfield Metal Body Co., Springfield, Mass.—Springfield metal bodies and convertible bodies and tops.
Taylor Co., H. D., Buffalo, N. Y.—*
Texas Co., New York City—Lubricants.*
Thermoid Rubber Co., Trenton, N. J.—Thermoid tires.*
Timken-Detroit Axle Co., Detroit, Mich.—Timken bevel and worm axles.*
Timken Roller Bearing Co., Canton, Ohio—Timken taper roller bearings.*
Turner Brass Works, Sycamore, Ill.—Tire pumps, brazing apparatus, motor cleaners.
Tingley & Co., C. O., Rahway, N. J.—Vulcanizing outfits.
Townsend & Co., Orange, N. J.—Townsend grease guns.
Tobey, Wm. L., Boston, Mass.—Q. D. rim removers and glare removers.
Tyer Rubber Co., Andover, Mass.—Tyrian tires.*
Torbensen Gear & Axle Co., Newark, N. J.—Gears and axles.
Tracy, Jos., New York City—Dynamometers.
United Rim Co., Akron, Ohio—Standard universal rims.
United and Globe Rubber Mfg. Co., Trenton, N. J.—Tires.
United States Light & Heating Co., New York City—U. S. L. starting and lighting systems and storage batteries.*
U. S. Tire Co., New York City—U. S. tires.
United States Gauge Co., New York City—Pressure gauges.
Vacuum Oil Co., New York City—Mobil oils and greases.
Valentine & Co., New York City—Varnishes.
Veeder Mfg. Co., Hartford, Conn.—Veeder tachometers, odometers and die cast parts.
Vesta Accumulator Co., Chicago, Ill.—Vesta storage batteries and lighting systems.*
Voorhees Rubber Mfg. Co., Jersey City, N. J.—Brown Scientific inner tubes.
V-Ray Co., Chicago, Ill.—V-Ray plugs.
Ward Leonard Electric Co., Bronxville, N. Y.—Ward Leonard electric lighting and starting systems.
Warner Gear Co., Muncie, Ind.—Gears and parts.*
Warner Mfg. Co., Toledo, Ohio—Gearsets.*
Warner Instrument Co., Beloit, Wis.—Warner autometers.*
Wasson Piston Ring Co., Hoboken, N. J.—Wasson piston rings.
Walpole Rubber Co., Boston, Mass.—Walpole tires.
Wayne Oil Tank & Pump Co., Ft. Wayne, Ind.—Wayne tanks and storage systems.
Weed Chain Tire Grip Co., New York City—Weed chains.
Wells Bros. Co., Greenfield, Mass.—Screw cutting tools.*
Weston-Mott Co., Flint, Mich.—Axles and parts.
Western Tool & Forge Co., Brackenridge, Pa.—Drop forgings.
Westinghouse Electric & Mfg. Co., Pittsburgh, Pa.—Motors and electric supplies.*
White & Bagley Co., Boston, Mass.—Oilzum lubricants.
Wheeler & Schebler, Indianapolis, Ind.—Schebler carburetters.*
Whitney Mfg. Co., Hartford, Conn.—Whitney chains.
Willard Storage Battery Co., Cleveland, Ohio—LBA storage batteries.
Williams Co., J. H., Brooklyn, N. Y.—Drop forgings and wrenches.
Willey Co., Long Island City, N. Y.—Paints and colors.
Wolverine Lubricants Co., New York City—Wolverine lubricants.
Young, O. W., Newark, N. J.—Lubricants, tire repair outfits.

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REILLY DEFINES TRUE TEST OF SALESMANSHIP

Says the Real Salesman Is He Whose Customers "Come Back for More"—Makes the Principle Apply to Goods as Well as to Men —Deprecates Attitude Displayed at Shows.

Whooping exultingly at having regained a supremacy it had not enjoyed since the preceding spring, a real wintry blizzard was dashing the snow against the windows and making outdoor life about the most unpleasant vocation imaginable. Reilly had been a half hour longer than usual in getting home through the storm, for railway lines of all description were badly handicapped and the warmth of the house was a real pleasure once he gained his destination. But with supper over and his smoking jacket donned, he had settled himself in a deep Morris chair and was enjoying a fat and black cigar and the evening paper in an "I should worry" manner.



REILLY LEISURELY SAT DOWN ON THE WINDOW SEAT BEFORE HE ANSWERED

Reilly's Evening Is Interrupted.

When the telephone bell buzzed he leisurely pulled himself from his comfortable position and crossed the room to the window seat whereon this modern invention reposed; also, he was in such a leisurely and I'm-comfortable-what-do-I-care-if-it-does-storm mood that he actually sat down on the window seat before he answered the insistent ringing of the little bell.

"Hello! . . . Yes, this is Reilly. . . O, hello, Jim! Where are you and why on a night like this? . . . Snowbound! Spent two hours coming twenty miles! I can imagine it. Shoot me a game of pinochle to see if you can stay all night, will you? Well, if you can persuade a taxi driver to bring you up to the house I'll lodge you gratis. . . . Sure! Come up."

Sales Manager Stopped by Storm.

Mrs. Reilly, dishcloth in hand, listened to this one-sided conversation and, as her husband hung up, she asked, "Who is it—the Sales Manager?"

"Yes," he replied, "he's been out of town and got this far on his way back and it's storming so he doesn't want to try to go any further. He's coming up. Guess he wants to try to get even for the last trimming I gave him at pinochle."

It was many minutes before the Sales Manager put in an appearance, but it was not more than fifteen minutes before the two men were deep in that game which is best known of the Fatherland's amusements. Reilly was triumphant in the first session and was shuffling for the second when the Sales Manager asked: "Going to the New York show?"

"I think I will," was the answer.

"I believe that every dealer ought to see one of the big shows," added the Sales Manager. "It does a man good to see the best efforts of other people and size up the differences in cars; generally you can find something to help out your salesmanship."

"Yes, all except salesmanship," interrupted Reilly as he turned the nine of diamonds.

"You may criticize the methods of salesmen," asserted the Sales Manager, "but if you were directed to define perfection in selling, or to designate the true test of salesmanship, what would you say?"

An Opinion on Selling Ability.

"Well," was the slow response, as Reilly melded a wedding in trumps and marked it down, "I have often thought of that; the best expression I know of is that true salesmanship is the kind that induces a man to come back for more."

"Some men can't 'come back,'" joked the guest. "Jim Jeffries couldn't."

"Now you're trying to be funny," reproved Reilly, "and you're just as funny as some forms of so-called salesmanship. But this coming back business is pretty sound, as you will discover if you look into it. And so far as learning salesmanship at the shows, I doubt it. You will find a whole lot of men in dress suits standing around among a fine bunch of cars and a good share of them will exert their ability to keep you from asking them questions they can't answer. They are exceptionally well posted on the handsome appearance of the cars and the depth of the upholstery and can tell you offhand how easily the car rides; but if you ask them why the bore is four and stroke five instead of the stroke being four and the bore five, they'll try to make an appointment for you to meet the chief engineer who'll 'be there in about an hour.'

Learning a Line Thoroughly.

"One of the best suit goods salesmen I ever knew went out and studied cotton and

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wool from the plantation and the sheeps' backs to the suit that has been worn a year; he learned his line, but what some salesmen don't know would make them dizzy if they had to have it crowded into their heads over night. I don't mean that there won't be real salesmen at the shows, but along with them will be some of the half-baked variety; they're like half-baked potatoes—superficially done."

Reilly was interrupted to chalk down one hundred aces for the Sales Manager, who said: "Then according to your 'come back' theory it will take a year or so to test a salesman thoroughly."

Test Applies to Goods as Well.

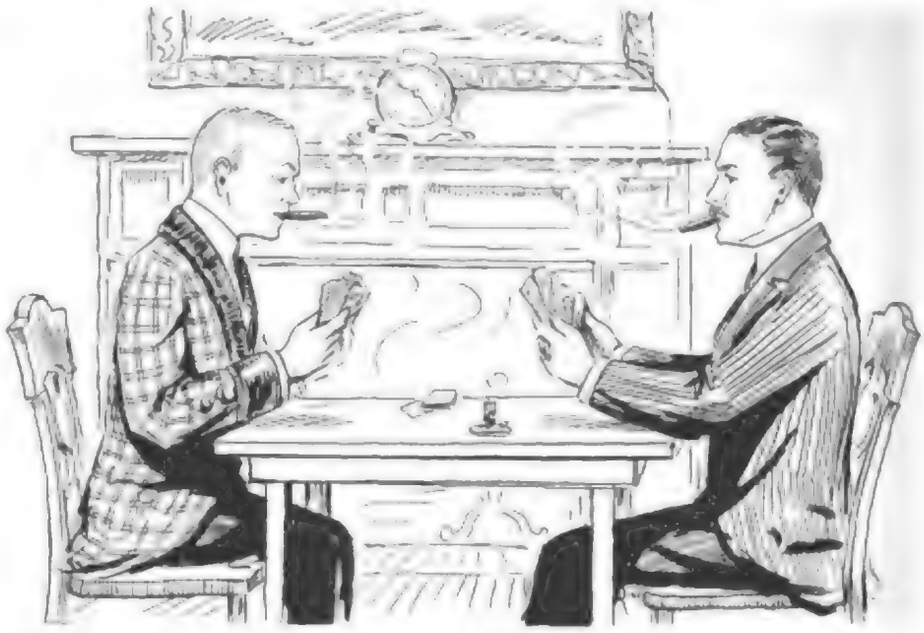
"Can you test a car in less time?" was the interrogative answer. "This 'coming back' is not a question of men alone; it applies to goods as well. A car may look fine and run all right on the start, but if a man doesn't buy the same make the second time it looks a little bit as if there was some weak selling point about the car. A car may be an average car and hold its own and the owner may change makes on his second purchase just because he likes to change, but if the car is above average and suited him in every paarticular he ought not to be hard to sell when he is ready for another car.

"The car has considerable to do with it, but nevertheless the best application is to the salesman himself. Salesmanship will sell but salesmanship alone will not retain permanent patronage, is a rather pithy way of expressing it, and it means a lot when analyzed. A man may be well-dressed, he may be suave and polite in manner and may have all those exterior qualifications which are essential to the salesman; but if he isn't able to hold a line of customers he is short somewhere.

"Take, for instance, any dealer who is a good first-time salesman. We will go that far into his ability for a starter and concede that he can follow up a new prospect, arouse interest in him and finally get his name on a contract; that man thus far is a customer. He is suited with the car—or thinks he is—or he wouldn't have bought it. Also, making him think he is suited is the result of the salesman's work; when the salesman began on him the buyer had yet to be brought to the point where he wanted the car bad enough to let his desire make a hole in his bank balance.

Keeping the Car Owner Satisfied.

"Now, take the same salesman and the same owner; if the salesman is the right kind, and this applies especially to the dealer-salesman, the customer will be kept satisfied. No hired salesman without his employer back of him can accomplish the full result; but the dealer who is selling for himself and running his own business can do it. Selling the first car is a small part, but it is the beginning. Supposing the owner has a little trouble and is inclined to become dissatisfied; right there is where the dealer rounds out his salesmanship to the full. He doesn't adopt a To-hell-with-you-I've-got-your-money attitude, but does his best to get the owner back into his happy frame of mind. Having once persuaded the man that he would be satisfied with the car, it is up to the salesman to make good; real salesmanship consists not alone in making a man believe he wants a car but in making him believe afterwards that he is glad he bought it."



"THERE ISN'T A BETTER 'AD' THAN A REPEAT ORDER," DECLARED REILLY

"Come on, come on!" broke in the Sales Manager, "mark down that forty pinochle!" Reilly did so, and continued:

Liked Car But Didn't Buy Second.

"Most men who can afford cars can afford them in the full sense of the word; they do not want a car unless they can be fully satisfied, and they are willing to pay their good money for that satisfaction. I know a man right in this town who bought a certain make of car, and on the start was a red-hot booster for it. To this day he has nothing but good to say of the car, but when he bought his second machine he bought another make and it cost him about $1,000 more than it would had he bought the same make as his first car.

"The trouble was with the dealer, whose chief stock in trade is a mouthful of ready-made excuses which he calls explanations. The owner, after the car had been running for some time, went back to the dealer one day for something and, while the dealer wasn't frigid, he wasn't as agreeable as he should have been. Through all the following months the owner encountered a sort of lax and don't-care reception whenever he went to the dealer, and he began to believe that all the dealer wanted was his money—that the dealer didn't care what became of the car or owner thereafter. I don't think he was entirely right, for the real trouble was that the dealer didn't realize the value of keeping a satisfied clientele. It wasn't any one big thing but a succession of little things coupled with the dealer's general attitude. The owner could have traded for a good price when he bought his second car had he gone back to this dealer, but rather than deal with the man again he bought a new car outright, and in the spring had to sell his old car for almost nothing. It cost him something, but the satisfaction he is getting now was worth it."

"Who sold him the second car?" asked the Sales Manager.

"I didn't try to get myself into this discussion, but I sold it to him," admitted Reilly. "I would rather sell a second car to a man than win a reliability run; luck may win the reliability, but it isn't luck that brings a customer back for more. It's the true test of salesmanship. You'll find it in every trade; salesmen of the best type are forever taking care of their customers in some way, keeping them satisfied and causing them to give repeat orders. Especially in the automobile business, there isn't a better advertisement than a repeat order.

Superficiality Damaging Quality.

"The superficiality in some salesmen is beyond my comprehension. They must know, if they know anything, that they can-

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not forever gather trade from new customers; new customers will build the trade and make it bigger, but the heart of the business must be the customers who stay with the house. Big department stores are among the leaders in winning and holding trade. They advertise and bring new customers, give a money's worth to show their desire to please the customer and go even further in furnishing comfort rooms and little conveniences that cost money to maintain and that are of value only as a means of taking care of their trade. This is partly included in service in the automobile business, but service is not all of it; there is more than one kind of service, and the kind that counts the most is the kind that you give as if it were a pleasure."

"Just to show you that you're a good salesman, I will now proceed to come back," said the Sales Manager, as he melded the second one hundred and fifty trumps he had laid down in the game then in progress.

"You must be getting good service," suggested Reilly, examining the scores.

"I am; I declare out," exclaimed the Sales Manager as he threw down his hand and began to count his cards.

"That's the only way you can win a game," taunted Reilly. "Get a man into an argument so he won't watch the score."

"Perhaps," causally suggested the Sales Manager, "you might classify that as that first-time or one-time salesmanship that you were talking about; I may not get you twice in succession, but I got you that time."

To Refinance the American-La France.

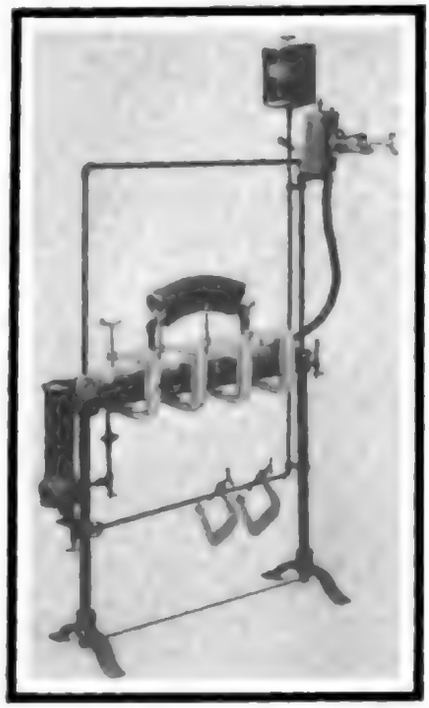
Plans for the refinancing of the American-La France Fire Engine Co. of Elmira, N. Y., which, in addition to fire engines, manufactures the La France hydraulic motor truck, have been carried to a point where they are about ready to be put into practice. They provide for the introduction of $600,000 of new money, the need for which has been made imperative by the expansion of the business.

A year ago all of the assets of the American-La France Fire Engine Co. were sold to a new corporation of the same name. The capitalization of the old company consisted of $900,000 of first mortgage bonds, $1,000,000 preferred stock, and $1,000,000 of common stock, besides which there was a floating indebtedness of $500,000. The new company has a capitalization of $2,000,000 of 7 per cent. cumulative preferred stock and $1,450,000 of common, the indebtedness having been paid from the sale of new stock. Earnings of the new company are said to be running at the rate of 10 per cent. on the common stock, after allowing for the preferred dividend.

SHALER GARAGE VULCANIZER ELIMINATES BRAIN WORK

Designed To Do Big Jobs and Little Ones, Too—Regulating Thermostat and Special Clamps Minimize Trouble.

Vulcanizing a tire or a tube repair so that the job will stand real use is work that must depend largely upon the application and maintenance of the right degree of heat; and to this particular phase of the work the C. A. Shaler Co., of Waupun, Wis., has given special study, having evolved a thermostat that answers the purpose admirably.



SHALER AUTOMATIC VULCANIZER

The most recent of the well-known Shaler vulcanizers to which the thermostat has been applied is a steam-heated garage model, which not only will do a considerable amount of work all at once, but is sufficiently economical in operation so that it can be started up to make a but single tube repair with profit.

The steam generator is a copper coil boiler heated by gasolene at an expense of about a cent an hour; steam can be brought to the required temperature in 20 minutes, and the tank holds enough for a full day's work. Once steam has been raised, the thermostat automatically regulates both temperature and pressure. For repairing blow-outs there is a pair of heaters or moulds, one of which goes inside the casing and the other outside, both being connected to the steam supply; these moulds are pressed together by means of special clamps, and the vulcanizing process is carried on from both sides simultaneously. A tape-wrapping process and the arrangement of the clamps results in the forcing together and the perfect union of the new rubber and the old. The moulds are so shaped that tires of practically any size can be handled.

One of the features of the new vulcanizer, and one to which special attention is called, is that its operation has been reduced to the utmost simplicity. The thermostat eliminates the necessity for watching the pressure and temperature, so that the only factor to be considered is the time. The mechanical parts are simple enough for a boy to handle and adjustments are rapidly effected. The tube plate used for the repair of inner tubes is 30 inches long and will carry six tubes at once, while the casing attachments are ample to handle blow-outs in the largest casings.

Many Rambler Men go Higher up.

New Year's presents in the form of substantial promotions were given by the Thomas B. Jeffery Co., of Kenosha, Wis., to a number of the men who had been tried and found true in Rambler service. Louis H. Bill, for many years in charge of the Rambler interests on the Pacific Coast, was appointed assistant general manager in charge of both factory and sales, and Harry E. Field, for three years manager of the Eastern branch, was elevated to the general sales management of the company; George H. Cox will be his assistant. Both Bill and Field are graduates from the bicycle industry. George H. Berry, former sales manager, was elected second vice-president and treasurer of the Jeffery company, and Edward S. Jordan, advertising manager, was made secretary; Jordan, however, will continue to handle the Rambler advertising. Charles T. Jeffery remains president and Harold W. Jeffery vice-president; previously the latter also served as treasurer. In the factory proper several promotions also were made, J. W. De Cou being appointed factory manager and John Bjorn assistant factory manager and general superintendent, while Geo. N. Bliss and M. Mattson were designated assistant superintendents. All of these men have been from nine to 23 years in the Jeffery service, having served the late Thomas B. Jeffery when he made Rambler bicycles.

Firestone Branch in Cincinnati.

The Firestone Tire & Rubber Co. has opened a branch in Cincinnati, at Ninth and Sycamore streets. It will be in charge of E. S. Firestone.

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WIDE-A MERCHAN In the MOTOR W

TO PUT FINGER ON WEAK SPOTS

Methods That Permit of Its Being Done—Conclusions Must Be Drawn from Facts, Not from Hopes.

The closer one gets to the automobile business and the more exhaustively he studies its various angles the more quickly he sees that in its essentials it is exactly the same as any other business and that it differs only in kind. The same qualities that will make a success in any other business will help a man to make a success in the automobile business.

Necessity of Up-to-date Records.

A lazy man is not likely to make a success, nor is the procrastinator—all of which is another way of saying that we must not only hustle but must also cultivate the habit of doing things when they should be done—not several days, or weeks, or months after it is too late.

It does no good to sit down and figure that during the last two years you have lost $20,000. Records should be up-to-date and should be immediate, adequate and reliable; that is, they should be daily summarized in such form that you can tell instantly "where you are at"; this, of course, means completeness that permits you at once to put your finger on the weak spot and proceed to build it up or perform a surgical operation; coequal with the other two essentials is the quality of reliability. If your records can be described as immediate, adequate and reliable, then brains and business judgment will steer the bark of business straight.

Know Why Profits Fail to Come.

If business is not good, if you are not making money, get down to brass tacks and earn the reason why. To learn that you have not made money after your money is gone is neither good business nor good sense; neither is it so uncommon as to cause remark.

Business is a science. Science does not guess. It analyzes causes and effects. It classifies facts. Science concerns itself with the known. It does not dream nor wonder; it weighs; it measures; it compares; it draws conclusions from facts, not from intangible optimistic hopes. Its logic is the logic of facts.

The closer business is shaped to meet the facts in the case and the more persistently and constantly facts are dealt with the less cause there will be to dread the final showing of the trial balance sheet.

TO MAKE WINDOW DISPLAYS BRING QUICK RETURNS.

The object of a window display is to sell goods. It is a form of advertising; therefore each window display, if possible, should be complete in itself. That is to say, it should contain all the elements that make a complete advertisement. It should not only attract attention, but interest, convince, and create a desire for ownership.

One way to excite attention is by quantity display. A grocer might put a barrel of apples in his window and it would arouse no comment; but, let him fill the window with apples so that there appears to be an immense quantity and at once interest is created in apples; you look to see what sort they are; you wonder how they taste, and if they will keep, and so on; and if the price is right, and the apples look good, and you are fond of apples, it is more than likely you will buy.

The same principle holds good in a window display of accessories. Suppose you want to push spark plugs. It is only a small item, but you figure that the man who can get the spark plug business of your locality can keep most of the rest of it. The first move then is to have a good line of spark plugs; types to fit all motors, and a stock sufficiently large to make an impressive display—to fill the windows—and to have cards telling the feature of the plug and back it up with the price in plain figures. Then you will make sales because your advertisement is complete.

Some people think that the only time to feature a price is when it is a cut price. That is certainly not the case. If the article by its appearance, construction, quality and serviceability as told by your printed cards justifies the price, you need have no fear of printing it. Too many sales are lost by lack of this important feature of window display. Desire is created in an instant, and that's the time to cash in on it.

RISING TO AN OCCASION.

An interested organization from manager to porter appears to exist in the Metzger-Herrington Co., of Chicago, whose porter is credited with having brought about the sale of an Argo electric a few days ago when it would have been easier for him to have said "I don't know anything about it; everybody's out; you'll have to come again." The porter in question was alone in the establishment on New Year's Day, he being left to care for calls for service. During the day Dr. B. W. Sippy walked in and said he wanted to buy a car, pointed to one which stood on the floor, and said that if the porter would give him a lesson of about five minutes' duration he would write a check for the price —$2,800—and would take the car immediately.

The porter did not announce his inability to make the sale, but said: "Wait a minute; I'll get a salesman here in ten minutes." He telephoned to a salesman's residence and the sale was made shortly after this individual arrived. At latest accounts the porter was not patting himself on the back but was busy at work, the same efficient porter he had been before; which is as much as saying that he will not always be a porter.

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AWAKE-N DISING WORLD

SMALL SALE WITH LARGE MORAL

It Was Only a Hood Cover But It Illustrates Three Sorts of Salesmanship—What Impressed the Buyer.

He wanted to buy a hood cover for his car. He did not know much about them—did not know their prices, their make-up, nor anything about them except that many of them were being used. A friend in whom he had confidence had told him that morning that hood covers were a great thing, not only because they made starting easier, but because they kept the engine radiator warm and made winter driving easier on the engine because of that warmth.

Indifference and Insufficiency.

At the first place he visited they told him the prices were from $7 to $12, and it would take two days to deliver the hood after they had measured his car. No effort was made to close a sale and get the order. The salesman felt he was through when he had named the prices.

The motorist made up his mind that he would inquire further. Perhaps there would be a difference in prices. So he went to an accessory store a couple of blocks away.

"Yes, we have hood covers—here they are," said the clerk, showing two miniature samples on a counter. "We can give you a hood cover for $7, plain like this, or a quilted one which wears better for $9, or a real good hood cover for $12."

"What's the difference between them?" asked the motorist.

"A difference in quality," replied the clerk.

"That's pretty vague—supposing you tell me just what you mean; in other words, what more do I get when I pay $12 than when I pay $7? Will it keep my car any warmer? Will it last any longer? Is there any difference in materials? Is it heavier, or what?"

The clerk got mad because the customer wanted to know so many things and told him he would have to take their word that the quality was there. The customer decided to go elsewhere.

On the next corner was a place where many accessories were sold. As he entered a pleasant-faced salesman met him.

Definiteness and Courtesy.

"Hood covers? Yes, we make quite a lot of them. What car do you drive? A 'Sphinx'? We have had mighty good luck fitting up a number of them—it's a fine car, isn't it? We will make you a cover for a 'Sphinx' for $10—it will be as heavy as you will ever need—made of the best—heavy waterproof duck, lined with two layers of thick felt; we will fix it so you can lift either side of the hood, and we will make it so it fits your car exactly—and it will take us just a day and a half to get it out."

When the customer protested that his price was too high this salesman went into details and showed how he could leave off the quilting and save a dollar or so—how he could cheapen the duck and save a few cents and in less than fifteen minutes he had a man at the curb measuring the car.

The story of the hood cover is worth studying. It illustrates the indifferent clerk, the half-interested, antagonistic style and the salesman who is ready to tell the customer anything he desires to know and who is glad to explain the "reasons why" behind his price.

INCREASING GARAGE SALES.

The Gillespie Auto Sales Co. of Detroit, which conducts a service station for trucks, does a regular garaging business and makes a specialty of selling gasolene and oil at a few cents less than the other fellow, is wideawake when it comes to selling accessories and oil and grease. Right near the door is a series of cards, about 11 x 22 inches, calling attention to bargains in tire tubes, grease in five-pound cans, Prest-O-Lite tank service, storage batteries and dry cells. The cards are about the size of the conventional street car card and are mounted one above another in interesting array. Some of the signs are hand lettered with marking brush, others are painted by a good sign writer and some are printed, but all of them are readable and nearly all quote prices.

The signs hit you squarely in the eye while your gasolene supply is being replenished, and if you escape buying something it must be because you are very well supplied with everything. And the signs are changed often. They do not remain the same day in and day out, as in some garages. Of course, it is just a common-sense merchandising method, but too many garages do not make use of such methods. The idea is exactly the same as that of the druggist who sells you a tooth brush and then suggests a good dentrifice. The more things you can sell your customers the more of their money you can get and the greater the profit you can make.

LENDING A HELPING HAND TO THE NEW OWNER.

The foresighted dealer will follow with closest interest the experiences of the new car owner at this season of the year, and if he is wise indeed, he will forestall many of the possibly unpleasant experiences of his customers by a kindly word of advice and caution. The man who sells a car has a responsibility far deeper than the delivery of it to the right address, and part of that responsibility is to teach the new owner the proper care of his machine.

These things become so common that many men are prone to think everybody else knows all about them. But, think over the list of those to whom you sold cars and can sell them that will make their winter can tell them that will make their winter motoring experiences pleasanter or otherwise more satisfying.

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HEEDING THE BOY AS ONE METHOD OF MAKING SALES

Willys - Overland Cites Instances Where Juveniles Have Influenced Purchases—Advises Dealers to "Take Notice."

Absence of courtesy in a thorough form may cause a salesman to discriminate between individuals because of their clothes and thereby lose a sale to a not well-dressed man who may, nevertheless, be able to buy and sell the salesman several times, but a disregard of children probably in the majority of instances is due to rather pardonable unappreciation of the possible sales that may be gained through juvenile influence; many an automobile salesman has never stopped to consider that just because a questioner is young in years he may nevertheless be the means of bringing a commission into the pockets of the motor car merchant.

How important it is that the childlike questions of children be answered and that they be not dismissed with a "Don't bother me! I'm busy," has been emphasized before in Motor World and doubtless will be again; the story has been told of the Brooklyn dealer who makes friends with the boys in "pushmobiles" and gets them to paint the name of his car on the bonnets of their little vehicles and instances have been cited by boys and girls, who have walked into salesrooms and made purchases of their own initiative without the formality of calling in a parent to close the sale. And at least one great big automobile manufacturing company has recognized the value of the small boy as a selling aid and has gone so far as to urge its dealers to do likewise.

The company is the Willys-Overland Co., of Toledo, O., and its urging is contained in a communication issued by the advertising department, which, in large measure, is as follows:

"We maintain—and every old-timer in the business will bear us out—that the inquiries of boys concerning motor cars are much too important to overlook or ignore. In the average family the most 'up-to-the-minute' member, and the one who will most insistently urge his father to buy an automobile, is the boy. It is the boy who collects and reads the catalogs and who knows much more about automobiles in general than his father. Have you ever noticed how often, when you pass him in your car, the boy of to-day will say, 'It's an Overland' Ten to one his father wouldn't have known it from any other car.

"A boy on roller skates recently rolled into the Overland salesroom in Cleveland, shouting at the head of a concern, 'Mister, please gimme an Overland catalog.' He got the desired book, and before closing time that night the firm had sold the youngster's mother an Overland car. Our Denver dealer tells of driving 72 miles to a ranch to investigate a prospect disclosed in a remarkably well written letter asking for a catalog. He found only the ranchman's son, a boy of 14 years, who admitted writing the letter without consulting his father. Though at first inclined to be 'peeved' at what he considered a wild goose chase, the dealer explained to the lad the features of the car and gave him a ride over the prairie. Within a week the boy's father had purchased an Overland, and to-day two other sons and the rancher's brother are Overland owners.

A negro boy recently asked the New York dealer for a catalog, explaining that while he couldn't buy a wheelbarrow, he hoped some day to be a 'shoffah.' The dealer gave the youngster all the information and literature he had and a demonstration ride. Within a few days a New Jersey farmer entered the salesrooms and declared he wanted to buy an Overland car. 'It must be the popular car, for all the darkies on my farm are talking about it,' said the farmer. A little questioning disclosed the fact that the negro boy with ambitions to become a 'shoffah' was employed on the New Jerseyite's farm.

"These instances are enough to remind you that the boy is not to be slighted. The boy of to-day is the man of to-morrow, and even now his voice is loud and insistent in the family council. Not infrequently the boy is the only member of the family who has read your advertisement and is therefore the only path by which you will be able to reach the father, who, generally, is the one who has the money to spend on a new car."

"Honey Fitz" Tackles Gasolene Situation.

Not content with idly protesting against the soaring price of gasolene, though he has gone to the length of writing to several Massachusetts congressmen to urge drastic legislation against the conduct of the Standard Oil Co., Mayor Fitzgerald of Boston, familiarly known as "Honey Fitz," has a plan which he hopes will effect at least temporary relief. He proposes to establish a municipal gasolene supply station somewhere near the heart of the city, where a large tank can be placed so that Boston's motorists can purchase their fuel from the city at wholesale rates. Already, he has requested Commissioner Rourke of the Public Works Department to choose a suitable location for the depot and to prepare an estimate of the cost of erecting the necessary tank.

SELLING PROBLEMS IN THE LAND OF QUEUES AND FANS

Persuading the Chinaman to Buy a Car Differs Widely from Approaching an American—Much Tea Drinking Involved.

How to sell a car to a Chinaman may become a course in schools of automobile salesmanship, and if M. A. Greenfield, agent in Shanghai, China, for the Michigan car has the wily Celestial correctly measured, such instruction would fill a need which is felt by those Americans who migrate to the Heavenly Empire with the expectation of getting a series of Chinese hieroglyphics at the bottom of an order blank. Putting in preliminary sales talk over a tea table or some other form of table is falling into disrepute in this country, but in China, Greenfield says, the ability of the salesman is partly gauged by the amount of tea he can drink. It all goes back to the Celestial's disinclination to hurry, which is not in accordance with methods in America.

"The Chinese will not be hurried," said Greenfield in telling the salesmanship troubles of the country in which he now is working. "When you have picked the customer for your car, you must call on him two or three times before you close the deal. You must spend hours with him, and sometimes days. You will discuss politics, progress, business, clothes, family—everything except the automobile. You will drink his tea and scrupulously exchange all the courtesies with him.

"If you attempt to rush matters, he will think you are trying to perpetrate some sort of a swindle, otherwise you would not be in such a hurry to get away. When at the last you finally get around to the sale of the automobile, it will be a comparatively easy matter, for your customer will have been silently making up his mind. Once his mind is made up, nothing can shake it. He puts his faith in the 'chop'—that is, the trademark. In the case of the automobile, it is the name plate on the radiator.

"Your mandarin purchaser is a loyal advertiser for you. It will not be a week before all his friends know all about his car. They will ask for a car with the same 'chop' as that on their friend's, and cannot be persuaded to look at any other. If the mandarin has bought a medium-priced car, and someone should come along and offer him the highest-priced car made, he cannot make a step of progress, because his car does not show the preferred 'chop.'

"In Shanghai, a city of about a million population, there are to-day, I should say, about 800 automobiles."

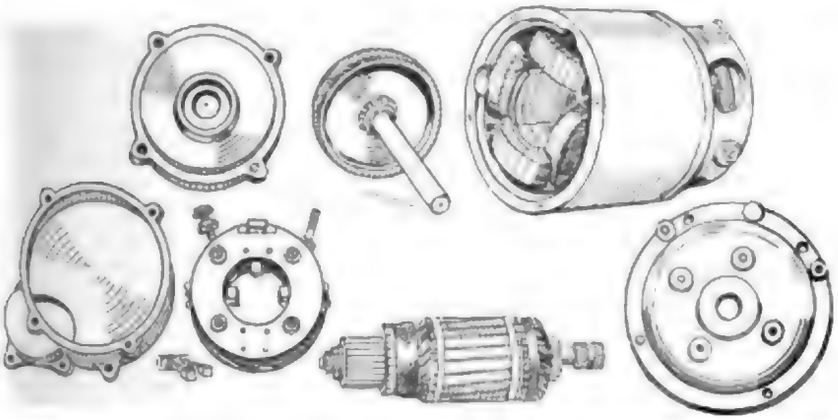
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KEEPING ABREAST OF STARTERS AND LIGHTERS

The Aid to a Thorough Knowledge of Electrical Equipment That May Be Found in Instruction Books—Practice That Can Be Gained Without Them—Esterline System as an Example of Compact Simplicity.

(This is the fifteenth of a series of articles designed to make clear the electric lighting and engine starting systems in use and to render easier their care and repair by the dealer and owner alike.)

It is a lamentable fact that not a few automobile dealers may be likened to the old codger who, though religious enough on occasion, was just plain lazy when it came to repeating his prayers. He laboriously wrote them out on a sheet of paper and tacked the paper to the head of the bed. It was his habit each night before blowing out his candle carelessly to nod in the direction of the paper with the injunction: "Lord, them's my sentiments." Devotion of the kind was sufficient, to his mind, and it is altogether likely that he "slept the sleep of the just."



ESTERLINE STARTING MOTOR DISASSEMBLED, SHOWING COMPONENT PARTS

When Instruction Books May Work Harm.

"You'll find it all in the book," not infrequently is the dealer's substitute for "Lord, them's my sentiments," when an owner comes back at him for more information, the book in question being the printed instructions usually supplied by the manufacturer. It is good, of course, that the manufacturer does supply concise information for distribution in printed form by the dealer, and it is only fair to add that it generally is possible "to find it all in the book." That is to say, it generally is possible to find out all about the car in the book, without reference to the accessories. In very few cases have manufacturers remembered that the electric lighting and engine starting system with which the car is equipped now is as much a part of the car itself as is the engine or the gearset or the axles. And though quite a number of manufacturers of electrical equipment supply their own instruction books, which undoubtedly serve a useful purpose, a warning should be noted in the fact that they also serve as a ready excuse for the oft-reiterated saying, "You'll find it all in the book."

Analogy Between Laziness and Ignorance.

That phrase, to many a dealer, is all-sufficient. Though he may excuse his laziness in undertaking a first-hand explanation by stating that "the book tells it so much better than I can tell it," the fact remains that if it is not laziness, it is ignorance, neither of which is calculated to inspire confidence or to further trade. If there is a "book," there can be no excuse for ignorance, unless the book is so incomplete as to make a thorough understanding of the system impossible when there is still less excuse for ignorance, for the very incompleteness of the book should serve to stimulate the dealer into educating himself with the aid of the equipment under his care. Plain laziness can be dismissed as a disease that generally is incurable.

The Value of Practical Training.

As a matter of cold fact, it is not possible always "to find it all in the book." Books are complete insofar as they go, but it scarcely is possible fully to cover every portion of a system and every slight derangement that is at all likely to happen to every portion, under one cover. Individual systems from the same manufacturer may have individual characteristics, particularly where they are fitted to different makes of cars, and no one is better able to become familiar with their idiosyncrasies than is the dealer, who comes in contact with a large number of owners operating a large number of systems under actual service conditions that may differ widely. To put it in expressive English, the dealer has a grand little chance to become thoroughly familiar with the apparatus fitted to the cars he sells, and it is his duty to do so, for the information which will be gained represents that phase of service which makes friends and makes business; it spells death to the apparent indifference which lurks in the saying "You'll find it all in the book."

Prevailing Desire for Enlightenment.

The mere existence of such instruction books, brought out only recently in the majority of cases to fill a well-defined demand, makes it just so much easier, of course, for the dealer to become familiar with his equipment, though it never has been difficult, as has been made plain in the articles which have appeared in the fourteen preceding issues of Motor World. Quite naturally, every one whose car is equipped with an electric lighting and engine starting system wants to know exactly what to do in case of trouble, for though it is realized that, with the present efficient equipment trouble is the exception rather than the rule, the feeling that to be forewarned is to be forearmed is very nearly as strong to-day as it was in the days of primeval warfare; it represents a measure of security that is comforting, at least, and may prove to be salvation.

Importance of Proper Mountings.

In the actual method of mounting or driving either a dynamo or causing an electric motor to drive the gasolene motor until it picks up its owr cycle of operations, there should be, and experience has proven that there is, very little that need concern the dealer or the owner, much less cause either one any trouble. Still, the method of mounting and connecting constitutes an important subject to which comparatively little attention has been paid. In the first place, considerably more power is required to "spin" the average motor than generally is supposed, and it follows therefore that the

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mounting must be substantial and that the bearings must be sufficiently large to withstand the wear and tear of continuous service. Manifestly, drives which are suitable for dynamos are not suitable for motors.

The next consideration, which in view of present trends is perhaps just as important as the first, is that the drive must be practically silent. Despite the fact that starting motors are operated at best for but a moment or two at a time, and it might be conceivable that the prospective purchaser would be willing to "put up with" a slight noise in view of the convenience and safety of the apparatus, quietness is a factor which cannot be overlooked; it is one of the first things the prospective purchaser looks for, or, to be more accurate, listens for.

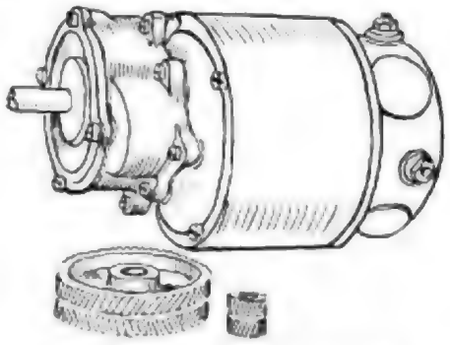
Combined Herringbone and Spur Gears.

There are several ways in which the electric motor can be geared to the gasolene engine: By "silent" chain, by direct coupling, by spur gearing, by worm gearing, and by herringbone gearings; combinations of two forms of gearing, such, for instance, as worm and spur or spur and herringbone, are not very common, there being but one exponent of each system. The former is the Hartford, which already has been illustrated and described in one of the previous articles of the present series, and the latter is the Esterline, the generating and accumulator portions of which also have been illustrated and described in an earlier issue.

In the Esterline starting system, which but recently has been added to supplement the lighting system that has been on the market for several years, the necessary reduction between the starting motor and the gasolene engine is obtained through the intermediary of a combined spur and herringbone gear arrangement, which is an exclusive feature. The herringbone gears are of the Weiss type, and though they are not calculated to run entirely without lubrication, it is one of their peculiarities that they may be run dry without noise almost for indefinite periods without danger of serious consequences. The pinion is made of bronze and the large gear of high carbon steel, which, considering the fact that the armature shaft is mounted in liberal sized S.K.F. self-aligning ball bearings, reduces the amount of lubrication necessary for efficient operation to the minimum. The starting motor is shown by the accompanying picture in a partly disassembled condition, the better to make plain its construction.

Enclosure That Prevents Dust Collection.

The field of the motor, which, by the way, operates on the purely nominal pressure of six volts and is capable of "spinning" a heavy motor at from 70 to 90 revolutions a minute, is cylindrical in shape, and when the assembly is complete the whole of the mechanism is completely enclosed and dust proof. Small inspection plates are provided over the brushes; they are sprung into place and may be easily and quickly removed without the necessity for tools of any kind. The gear box, as may be seen by the illustration, is made separate from the motor end casing, to which it is attached

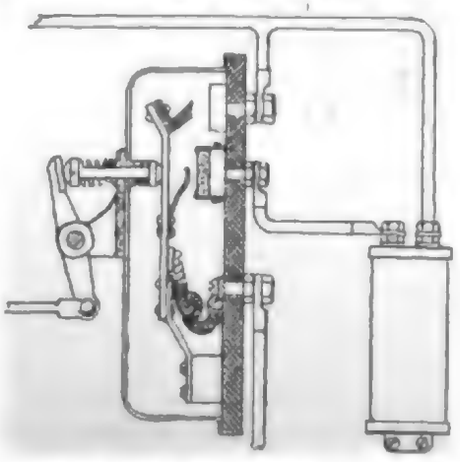


ESTERLINE STARTING MOTOR

by means of six heavy screws; like the armature, the gearing shafts are self-aligning. The field is of the series wound type, the four poles with their windings being plainly visible in the picture. The armature is of the drum type with the slots slightly skewed in order to permit of smoother running and reduce the noise of operation; windings are held in place by four heavy bands, thus obviating the possibility of centrifugal force deranging the wires and causing short circuits or breaks.

Operation of the Starting Switch.

The Esterline starting switch is of the double contact type and is operated simultaneously with the mechanism which shifts the starting motor pinion into mesh with the gearing cut in the periphery of the fly-



ESTERLINE STARTER SWITCH

wheel; the motor may be geared to the gasolene engine through the intermediary of a "silent" chain to the crankshaft, however, in which case the arrangement differs slightly, though in principle it is the same.

In operation, pressure on the starting button, which may be located either on the dash or in the foot boards, simultaneously moves the gears into mesh and closes the circuit between the battery and the motor. Before the gears come into mesh, however, the starting switch is closed first through a resistance which permits the motor to operate at slow speed and with little power, thus facilitating the meshing of the gears. Further depression of the pedal fully meshes the gears, and at the same time connects the battery around the resistance, permitting its full strength to pass to the motor. Immediately the gasoline engine commences to operate under its own power, the gears automatically are "kicked" out of engagement by the roller starting clutch.

Why Firm Pressure Is Necessary.

The starting switch is simple in the extreme, as may be seen by the accompanying picture, and should never require to be touched. It should be remembered, however, that the pedal should be depressed with a firm, unfaltering motion, for the main contacts carry heavy currents—from 100 amperes for a small four-cylinder motor to 175 amperes for a large "six"—that are likely to cause burning unless the switch is closed quickly and completely. If the contacts are permitted merely to touch together without sufficient pressure, there may not be enough metal in contact to carry the current and burning is likely to result. It will do no harm occasionally to remove the switch cover and clean the contacts, using for the purpose a piece of fine emery cloth. The contacts should be rubbed with the emery cloth until they present a uniformally bright surface all over. Needless to add, loose connections will work havoc with the operation of the system and always should be carefully looked for when occasion demands inspection for any other purpose. Dirt also is a natural enemy to efficient operation, and the opportunity to remove it from any part of the mechanism never should be lost.

How to Care for the Motor.

In the care of the motor itself, there is little that will require attention, for the reason that it is used only at long intervals and receives the minimum of wear. Incidentally, as it is in operation only a very small part of the time, there is a proportionately smaller chance of its mechanism becoming deranged. As the armature shaft is mounted in large ball bearings it is to all intents and purposes wear proof, and its demands in the way of lubrication will be exceedingly moderate—probably a few drops of very fine machine oil about once every two weeks unless it is used continually when the oil should be applied about once a week. In any case, more than a few drops never

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should be applied at one time, as otherwise it will collect on the winding and on the brushes, where it will cause sparking and poor commutation.

Cleanliness Absolutely Necessary.

The brushes and the commutator virtually are the only parts that need ever require real attention. Although they come into use but seldom, they carry very heavy currents for short periods, and for this reason great care should be taken to see that they are kept perfectly clean; foreign matter will tend to cause sparking, which will burn the comparatively soft copper of the commutator and reduce the efficiency of the starter. Though the motor is completely enclosed and theoretically is dust-proof, there generally will be found a small amount of dust within the casing when the caps over the brushes are removed. Some of it probably will be carbon dust from the brushes, which is no less harmful as foreign matter than ordinary dust. All such accumulations should be cleaned away preferably with a soft brush, though if caked on by reason of the use of too much coil a cloth dampened with goselene will serve to remove them.

All four brushes are fitted with what in electrical engineers' parlance are styled "pig tails" and consequently no attempt should be made to remove them entirely from the motor. It will suffice to take them out of their sockets to the length of the "pig tails" and wipe them clean of dust or oil. Make sure that they slip easily in their sockets and that the spring tension upon them has not been disturbed. If their ends exhibit accumulations of grease, they should be gently sandpapered until they appear clean, care being taken not to disturb the curvature any more than is necessary. If the brushes appear very dirty, it is altogether likely that the commutator also will require cleaning, though if it appears glazed and brownish it should not be touched. If it is sticky or oily, however, a cloth wrapped around the finger and dipped in gasolene should be applied while the armature is rotating.

"Pig Tails" That Need To Be Watched.

When the dirt has been removed, excess gasolene will dry quickly if the machine is permitted to run for a few minutes, when it will be possible to determine by inspection whether further treatment is necessary. The presence of cuts or scratches will make it necessary to apply sandpaper, which should not be coarser than No. 00 and must not be applied with any degree of force; a long, light application is better than a short, heavy one. When the scratches have been removed, apply a minute quantity of the best quality vaseline either with the finger tip (while the armature is rotating) or on a small piece of felt, afterward reassembling the brushes.

If, after the motor has been cleaned and reassembled, it should fail to operate properly or at all, the wiring connections first should be gone over to make sure that none of them have been disturbed during the cleaning process. Examine particularly the brush leads and the battery connections to the motor, as these are prone to loosen themselves and should be tightened carefully at every opportunity. If the wiring connections appear tight, examine the brushes to make sure that all of them touch the commutator properly; occasionally a "pig tail" may become twisted when the brushes are replaced and prevent the brush touching the commutator. Sometimes, also, "pig tails" may become loosened where they are attached to the brushes; care should be taken to remedy such breaks.

Diagnosing Minor Starter Troubles.

It has been assumed, of course, that the battery is properly charged, for it is quite obvious that if it has been permitted to become partly discharged the starting motor will not be as responsive as it should be. If all the connections are tight and the motor cannot be made to start the engine, it may be assumed that the battery is not properly charged, provided no meter is included in the circuit; burned out fuses, of course, would prevent the passage of current, and if fuses are employed they should be examined first. If a fuse has burned out, careful search for the cause of the failure should be made before a new one is put in its place, or the new one may be burned out immediately the current is turned on again.

The burning out of a fuse always should be taken as prima facie evidence that something is wrong—either that there is a short circuit or that the gasolene motor has stuck in some manner, preventing the electric motor from "turning it over." The freezing of the cooling water in winter, or the sticking of the pistons due to the use of oil that is too heavy and congeals in cold weather, both might be considered as contributing factors. It is advantageous, of course, to maintain the gasolene engine in such condition that it starts easily, for it then will require less current to set it in motion.

Balanced Field in Generating Unit.

As the generating portion of the Esterline system already has been described and illustrated in an earlier article in the same series, it will suffice merely to outline its features in order to refresh the memories of those who may have forgotten it. The generator is of the combined permanent magnet and electro-magnet type in which current regulation is obtained by balancing the strength of the one field against the other in such a way the field "builds up" rapidly at low speeds and the output remains practically constant over a wide range of speeds. The use of permanent magnets also insures against the possibility of the polarity of the generator inadvertently being reversed. The cut-out is of the electro-magnetic type and is completely enclosed in a housing. The battery employed is of 120 ampere hour capacity and furnishes six volts for both the lighting and starting circuits.

Julian Making Lower-Priced Motor.

Supplementing its only other product—a six-cylinder motor—which at the time of its formal presentation some three months ago was styled with pardonable pride "the highest priced stock motor made in America," the Julian Motor Co. of Syracuse, N. Y., has developed and is preparing to market a second six-cylinder motor which is not only radically different from the first in several particulars but is radically different from everything else of its kind as well. Incidentally, and in common with the first Julian motor, the newcomer exhibits a number of features that give evidence of more than ordinarily careful thought in design.

Unlike its predecessor, the new Julian motor has been brought out to fill the demand for a medium priced engine incorporating the latest most up-to-date engineering practice. It is like the older one in appearance only, in that every moving part is completely enclosed and the single casting is as "clean" as it is possible to make it; otherwise it is totally different as regards its design. Whereas the first motor is of the T-head type, the new one is of the L-head type, or rather of a modified L-head type, the arrangement of the valves being peculiar and an exclusive feature of the motor.

Instead of being placed side by side, as is usual in the orthodox type of L-head motor, the intake and exhaust valves in the Julian are placed one before the other, or very nearly so, with the exhaust valve innermost. The immediate effect obtained, of course, is that the inflowing gas is forced to pass directly over, and to come into contact with, the head of the exhaust valve, with the result that the latter is maintained at a practically constant temperature, thus minimizing the danger of warping. Incidentally, its temperature cannot rise to the point where pre-ignition is possible. By way of obtaining high efficiency, fairly high compression is employed. The bore and stroke of the motor are 4 inches and 5¼ inches, respectively, leaving little room for doubt regarding the aptness of the designation "long-stroke."

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FINES AND JAIL SENTENCES PROVIDED BY NEW SPEED LAW

New Ordinance Permitting Fifteen Miles in New York City Adopted —Owner and Chauffeur Made Jointly Responsible.

After having blinked at the regulation prescribing an impossible vehicular rate of speed of eight miles an hour for so many years that the blinking had become almost an irremedial habit, New York City, which under the Callan law is one of the cities of the first class that can make its own speed regulations, at length has seen the light, and on Monday, 6th inst., the Board of Aldermen unanimously passed the Folks ordinance raising the limit to 15 miles, thereby formally recognizing the ridiculousness of the existing law, which has been habitually broken by nearly every form of vehicle since the limit first was set. The measure goes now to the Mayor, and there is little doubt but that he will set the seal of approval upon it, in which case it will take effect March 1st.

As a whole it is fair and liberal, and in addition to raising the legal rate of speed to 15 miles an hour in general, with certain exceptions where the rate may be increased to 18, 20 or 25 miles an hour, the law also provides for fines and imprisonment for violations; and, what is even more important, it makes the owner jointly responsible with the chauffeur in the event of conviction for infraction of the law. Consequently, the owner of a car needs must keep an eye glued on his speedometer if he would keep out of court.

The first section of the law is a general provision against the reckless operation of bicycles, tricycles, velocipedes, motorcycles, horse-drawn vehicles and every kind of automobile, and the second prescribes a limit of 15 miles an hour, except on Broadway and Amsterdam avenue north of 125th street, in the Bronx, on the Grand Boulevard and Concourse and on Atlantic avenue, Eighteenth avenue, Flatbush avenue, Fourth avenue, Fifteenth avenue, and Kings Highway in Brooklyn, where it may be 18 miles an hour; on the Queens Boulevard, where it may be 20 miles an hour, and in rural sections of the city, where it may be 25 miles an hour.

Under the new law, the penalty for a first offense may be a fine of from $25 to $100, or 10 days' imprisonment, or both; a second offense will draw down a fine of from $50 to $100, 20 days' imprisonment, or both, and a third offense a fine of $100 or imprisonment for 30 days, or both. Excepting the first section, which merely applies the law to all vehicles, the ordinance is as follows:

2. Specific Rates of Speed—No person shall operate, drive or propel, and no owner thereof riding thereon or therein, shall cause or permit to be operated, driven or propelled, any vehicle subject to the provisions of Section one (1) of this article, on any public highway in The City of New York at a greater rate of speed than fifteen (15) miles per hour. Provided, however, that a rate of speed of eighteen (18) miles per hour may be maintained, but not exceeded on the following highways, namely: In the Borough of Manhattan, Broadway north of 125th street, Amsterdam avenue north of 125th street; in the Borough of The Bronx, the Grand Concourse and Boulevard; in the Borough of Brooklyn, Atlantic avenue, Eighteenth avenue, Flatbush avenue, Fourth avenue, Fifteenth avenue, Kings Highway. And provided further, that a rate of speed of twenty (20) miles per hour may be maintained but not exceeded, on Queens (Hoffman) boulevard, in the Borough of Queens. And provided further, that a speed of twenty-five (25) miles per hour may be maintained, but not exceeded, on public highways where the same pass through country sections which are substantially undeveloped and sparsely settled.

But nothing in this section contained shall be construed as in any manner of degree limiting or restricting the operation or effect of any of the provisions of section one (1) of this article.

3. Approaching Bridges, Turning Corners, Passing Public Schools, Meeting Street Cars—Upon approaching a bridge, or in turning a corner of intersecting public highways, or in passing a public school on school days between the hours of eight (8) o'clock ante-meridian and four (4) o'clock post-meridian, the person operating, driving or propelling any vehicle subject to the provisions of section one (1) of this article, shall not proceed, nor shall the owner of any such vehicle riding thereon or therein, cause or permit the same to proceed, at a rate of speed greater than ten (10) miles per hour, and in meeting, overtaking or approaching a street passenger car which has been stopped for the purpose of receiving or discharging passengers, every such vehicle aforesaid shall be brought to a full stop at a point not less than six feet from such street passenger car, and shall not proceed and pass such street passenger car between said car and the near curb or sidewalk until such street passenger car shall have proceeded.

But nothing in this section contained shall be construed as in any manner or degree limiting or restricting the operation or effect of any of the provisions of section one (1) of this article.

4. Application of Sections 2 and 3—Nothing contained in either section two (2) or section three (3) of this article shall apply to any of the following vehicles, to wit: Vehicles carrying United States mails, wagons, trucks and apparatus of the Fire Department, of the Police Department and of the military, emergency repair wagons of public service corporations, and ambulances, when in the performance of duty, and vehicles which run only on rails and tracks.

5. Violations, Punishment for First, Second, Third and Subsequent Offences—Jurisdiction—Any person who shall operate, drive or propel, and also any owner thereof riding thereon or therein who shall cause or permit any vehicle subject to the provisions of section one (1) of this article, to be operated, driven or propelled, in violation of any of the provisions of this article, shall be guilty of a misdemeanor, and shall, upon conviction for the first offense, be punished by a fine of not less than twenty-five (25) dollars nor more than one hundred (100) dollars, or by imprisonment not to exceed fifteen (15) days, or by both; and shall, upon conviction for the second offense, within one (1) year from the commission of the first offense, be punished by a fine of not less than fifty (50) dollars, nor more than one hundred (100) dollars, or by imprisonment not to exceed thirty (30) days, or by both; and shall, upon conviction for the third offense, and for each and every offense subsequent thereto, within one (1) year from the commission of the first offense, be punished by a fine of one hundred (100) dollars, or by imprisonment for a term not to exceed sixty (60) days, or by both.

Provided, however, in construing this section the unit of any one year shall be the basis for determining "first," "second" or "third" offense, the numerical order changing when succeeding convictions occur, and more than one year has elapsed after an original "first," "second" or "third" offense.

6. Ordinances Repealed—All ordinances and parts of ordinances of The City of New York inconsistent with, or contrary to, the provisions of this article, are hereby expressly repealed, except that no ordinance regulating or prescribing the rate of speed of street passenger cars shall be impaired or affected in any manner by anything herein contained.

In addition, three resolutions also were adopted, the first of which requests that the Park Board of the City of New York consider the advisability of revising its regulations to conform with the new law; the second requests that Justices of Special Sessions and City Magistrates notify the Secretary of State of violations of the law in order to facilitate the identification of offenders; the third requests that the Police Commissioner establish and maintain at headquarters a suitable card system in which to enter for future reference the names and descriptions of offenders.

Petrol Price Causes Another Taxicab Strike

Despite the amicable settlement of the recent taxicab drivers' strike in London to the apparent satisfaction of both the drivers and their employers, the drivers again have become dissatisfied and have "walked out," the result being that London once more is at the mercy of the once ousted hansom cab driver and his brother independent taxicab operators. Altogether, some 6,000 cabs are idle. The rise in the price of fuel and recent action of the principal companies in deciding to supply their drivers with "petrol" and to charge them for it, paying them a commission out of their weekly "takings," is directly responsible for the strike, according to the strikers, who maintain that it is impossible to earn a decent living under the low fares and high fuel price.

R. E. Brown has been elected president of the Mankato (Minn.) Automobile Club. The other officers are: Vice-president, C. H. Saulpaugh; treasurer, B. Bangerter; secretary, C. A. Ingwalson.

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CALIFORNIA "INSURGENTS" ADOPT A "CONSTITUTION"

Take Another Step Toward "Outlawry" and "Local Interpretation" of Rules—Peculiar Logic Brought to Bear.

Frank A. Garbutt and the 20-odd other Los Angeles motorists who believe that rules designed to apply in all parts of the country should not apply to California and Californians, and expressed their belief by the tentative formation of what originally was styled the Automobile Contest Association of America, have remained unconvinced despite the efforts which have been made since first they undertook their insurrectionary movement against the A. A. A.

They now are calling their organization the Western Automobile Association, and have gone so far as to adopt a constitution and by-laws, and if they succeed in their ends California will become an "outlaw" State and thereby will be closed to the rest of the country, and Californians must perforce race only in their own back yards, so to speak.

Although one of the vice-presidents of the A. A. A. is a Californian, and although Californians are represented on the A. A. A. contest board, Garbutt, who apparently never had heard of the Supreme Court of the United States, insists that the West "be given its own administrative officials, whose duties shall be to interpret and enforce the laws locally," and that "these officials be representative of the people they govern."

Apparently unable to distinguish that the A. A. A. is in the nature of a supreme court, Garbutt rather amusingly illustrates the situation by declaring that "an exactly parallel case would exist if our California State laws were enacted in New York and all of our courts also removed to that State. If such were the case our people here would be justified in asking for local courts to interpret and enforce the laws enacted for our local guidance."

This logic makes appear that when the Western Automobile Association formulates its rules each locality will be permitted to interpret them as it may desire, or as may meet any occasion which may arise.

Bay Staters Re-elect All Officers.

E. A. Gilmore was re-elected president of the Bay State Automobile Association at the annual meeting held at the Hotel Lenox, Boston, on Monday last, January 6th. With the exception of M. H. Guelsian, who resigned as a director and was replaced by W. H. Stevens, the entire governing board was re-elected. The other officers are: Vice-president, Harry W. Knights; secretary, C. P. Rockwell; treasurer, J. S. Hathaway; directors, A. B. Henley, B. G. Ellis, H. G. Kemp, Chase Langmaid.

Wetmore Heads Dealers' Contest Ass'n.

As was to be expected, in view of the fact that he was chiefly responsible for the birth of the association and has been the moving spirit behind it since its inception, John C. Wetmore, who is automobile editor of the New York Evening Mail, was elected president of the recently formed Motor Dealers' Contest Association of New York, at the first annual meeting, which was held at the Elks Club on Monday night, 6th inst. The other officers chosen were Wm. C. Poertner, vice-president; J. C. Nichols, treasurer, and Edw. F. Korbel, secretary. Prior to the election of officers, a board of 15 directors was elected, which, with the officers, consists of: A. J. Interrieden, I. M. Uppercu, George Robertson, E. J. McShane, C. H. Larson, Emanuel Lescaris, A. B. Cordner, W. J. Morgan, S. S. Toback, C. A. Stewart and H. M. Bronner. The decision as to who should hold the one-, two- and three-year terms, to conform to the by-laws of the association, was made by lot. The election of the executive and other committees was deferred until the meeting of the board of directors, which is scheduled for the evening of January 24th and will be held at George Rector's Broadway hostelry.

Hill Wins San Diego Road Race.

George Hill, driving a Fiat car, won the San Diego road race, which was run over a triangular course 91.7 miles in extent, on New Year's Day, Wednesday, January 1st, under the auspices of the San Diego Auto Owners' Club. Hill's time for twice around the circuit, or 183.4 miles, was 3:58:12, or at an average of 46.2 miles an hour. Second place went to W. H. Smith in a Mercer, who finished 14 minutes later than the winner, and third place to W. H. Carlson, Jr., in a Stutz, who covered the distance in 4:16:15.

Thirteen, including Robert Barman (Cutting), who experienced a broken steering knuckle and was forced to drop out, lined up for the start. The course, which was in none too good condition, led through Escondido and Oceanside and back to San Diego.

Unusual Rule for "Towed" Cars.

A somewhat curious regulation that is in force in England makes it compulsory for a car being towed to carry a number plate that is a duplicate of the plate of the car that is doing the towing. One of the two plates of the leading car can be used for the purpose.

SAVANNAH COURSE AGAIN FOR VANDERBILT AND GRAND PRIZE

Milwaukee "Passed by" in Favor of Georgians Who Once Cried "Enough"—Dates Not Yet Decided Upon.

Milwaukee will not supply the setting for the next Vanderbilt Cup and Grand Prize road races. The Motor Cups Holding Co., which has to do with the awarding of the "classics," heard on Monday last, 6th inst., the claims of Savannah as voiced by a committee comprising Harvey Granger, F. C. Battey and A. W. Solomon, and without more ado the Georgia city was given what it asked for.

Quite naturally, the management of the speed carnival will be vested in the Savannah Automobile Club, which already has run the Grand Prize contest three times—in 1909, 1910 and 1911—and the Vanderbilt race twice—in 1910 and 1911. If things go according to the tentative program, the races will be run over a ten-mile circuit having but four turns; and dates will be set sometime between November 1st and February 23rd next. Before it is certain that the race will go to Savannah, sanctions for the Vanderbilt and Grand Prize races must be obtained from the contest boards of the A. A. A. and the Automobile Club of America, respectively.

That the Milwaukee Automobile Dealers' Association had had hopes of again fathering the carnival is indicated by the fact that a committee was to have been sent to New York to meet the members of the Motor Cups Holding Co. after the conclusion of the Milwaukee Automobile show. And, according to Bart Ruddle, who managed the more recent races, the Holding company was petitioned by telegraph to give Milwaukee a chance to be heard. For all of which the name of the Western City was not mentioned at the Monday's session.

Henry Sanderson, Colgate Hoyt and Henry B. Anderson acted for the Motor Cups Holding Co. Wm. K. Vanderbilt, Jr., himself is across the "pond."

How to Cross Streets in Berlin.

That Berlin which is in Germany is about to have still another traffic regulation which is calcualted materially to reduce the chance of accidents to pedestrians. The police authorities of the fashionable Schoenberg and Charlottenburg residential sections of the city are preparing to issue printed instructions in the "legal" way to cross the streets. Hereafter, it will not be permissible to cross public thoroughfares diagonally; an angle of 90 degrees will be insisted upon.



1,021,983. Cushion-Tire. Albin Hajos, Chattanooga, Tenn. Filed Aug. 10, 1910. Serial No. 576,436. [Inner tube enclosed in metallic casing through which plungers, which form the tread, protrude.] 1 claim.

1,022,015. Shock-Absorber. James H. Woodring, Corry, Pa. Filed Aug. 29, 1911. Serial No. 646,587. [Helical spring retards relative movement of vehicle spring and frame.] 2 claims.

1,022,027. Hydrocarbon-Engine. Hiram Hyde and Jack Gage, Geneseo, Kans. Filed May 8, 1911. Serial No. 625,788. [Means for carburetting kerosene.] 3 claims.

1,022,040. Means for Removing Carbon from Engine-Cylinders. Eugene S. Michener, New Castle, Pa. Filed May 31, 1910. Serial No. 564,255. [Wire link chain placed in the cylinder and actuated by the piston.] 2 claims.

1,022,042. Vehicle-Washer. Edward Muller, East New Durham, N. J. Filed June 8, 1911. Serial No. 632,062. [Automatic valve cuts off water supply when device is not in use.] 6 claims.

1,022,087. Automobile-Starter. Charles D. Jenney, Indianapolis, Ind. Filed June 22, 1911. Serial No. 634,751. [Spring wound up by electric motor.] 11 claims.

1,022,127. Tire. Edward Dettelbach, Cleveland, Ohio. Filed June 17, 1910. Serial No. 567,377. [Open inner edges of inner tube clamped between beads of the casing.] 3 claims.

1,022,134. Window-Cleaner. John E. Heckert, Claremont, Cal. Filed May 4, 1911 Serial No. 624,941. [Windshield glass cleaner actuated by the motor on the depression of a pedal.] 8 claims.

1,022,145. Shock-Absorber Adjustment. Burton L. Lawton, Meriden, Conn., assignor to the Connecticut Shock Absorber Co., Meriden, Conn., a corporation of Connecticut. Filed Jan. 4, 1912. Serial No. 669,452. [Means for altering the relative position of spring and cam.] 11 claims.

1,022,151. Trackless Power-Driven Vehicle. Isaac E. Palmer, Middletown, Conn. Filed June 20, 1911. Serial No. 634,266. [Running gear for motor car.] 11 claims.

1,022,163. Anti-Friction-Bearing. Colcord Upton, Baltimore, Md., assignor to Simplex Roller Bearing Co., New York, N. Y., a corporation of New York. Filed March 6, 1911. Serial No. 612,465. [Roller bearing with small rollers interposed between the large rollers.] 10 claims.

1,022,177. Internal-Combustion Motor. Benjamin Brazelle, Kirkwood, Mo., assignor to Brazelle Motor Co., St. Louis, Mo., a corporation of Missouri. Filed Sept. 29, 1909. Serial No. 520,084. [Two cylinders which are in communication with each other at the moment of ignition.] 5 claims.

1,022,192. Attachment to Spark-Plugs. Henry C. Hemmeter, Pontiac, Mich., assignor of one-half to Cassius C. Van Wagoner, Pontiac, Mich. Filed April 27, 1911. Serial No. 623,589. [Enclosed spark gap which attaches to the plug terminal.] 2 claims.

1,022,220. Resilient Tire. Gideon S. Adams, Seaville, N. J., assignor, by direct and mesne assignments, to Eureka Double Resilient Tire Mfg. Co., Camden, N. J. Filed April 6, 1911. Serial No. 619,431. [Slots in the rubber add to the resiliency.] 2 claims.

1,022,281. Starting Device for Internal-Combustion Engines. Frank H. Walker, Atwood, Kans. Filed Jan. 7, 1911. Serial No. 601,261. [Compressed mixture conducted to the cylinders in the proper order.] 17 claims.

1,022,289. Tire-Vulcanizing Repair Apparatus. Cecil F. Adamson, East Palestine, Ohio. Filed Feb. 19, 1912. Serial No. 678,518. [Metallic casing in which gasolene is ignited, the heat being retained by cast pins.] 3 claims.

1,022,326. Carburetter. Joseph Namur, Kinsley, Kans. Filed Aug. 28, 1911. Serial No. 646,517. [Means for actuating the needle valve in accordance with the operation of the throttle.] 5 claims.

1,022,333. Armored Tire. Victor A. Rouilliard, Fall River, Mass., assignor of one-half to Armel L. Audet, Fall River, Mass. Filed Dec. 16, 1911. Serial No. 666,178. [Metallic coating electrically deposited over one layer of a composite rubber tire.] 2 claims.

1,022,369. Vehicle-Wheel. Gerard B. Lambert, New York, N. Y. Filed April 3, 1911. Serial No. 618,533. [Means of attaching demountable rim.] 3 claims.

1,022,372. Fender. Adolph H. Luebke, Montello, Wis. Filed Feb. 8, 1911. Serial No. 607,225. [Combined bumper and wheel guard.] 1 claim.

1,022,390. Internal-Combustion Engine. Jarvis S. Jennings, Jr., Detroit, Mich., assignor of one-third to Benjamin Siegel, Patrick O'Brien, and Leo Breisacher and one-third to Fritz Goebel, Detroit, Mich. Filed Sept. 21, 1909. Serial No. 518,814. [Free piston in the cylinder above the working piston.] 11 claims.

1,022,401. Control-Lever for Automobiles. Louis Chevrolet and Etienne Planche, Detroit, Mich., assignors to Chevrolet Motor Co., Detroit, Mich., a corporation of Michigan. Filed Nov. 15, 1911. Serial No. 660,357. (Levers housed in the door of the body.) 3 claims.

1,022,413. Lower Crank-Case for Combustion Engines. William H. Goldstine, Flint, Mich. Filed July 28, 1910. Serial No. 574,382. (Form and means of support of the connecting rod oiling trough.) 1 claim.

1,022,430. Spring Wheel for Vehicles. Frederick William Margetts and William Henry Margetts, East Dulwich, England. Filed Nov. 12, 1910. Serial No. 592,050. (Cams, and levers actuated by helical springs between the felloe and the rim.) 5 claims.

1,022,463. Automobile Lamp-Bracket. John E. Browne, Brookline, and Henry Herbert Colson, Everett, Mass. Filed May 1, 1911. Serial No. 624,275. (Rods attaching to the steering gear afford means of turning the lamp.) 4 claims.

1,022,476. Explosive Engine. Frank J. Gremel, Detroit, Mich. Filed March 14, 1910. Serial No. 549,321. (Double acting cylinder.) 4 claims.

1,022,492. Internal Combustion Engine. John J. McIntyre, Hartford, Conn. Filed April 12, 1910. Serial No. 555,046. (Two-cycle motor with separate compression chamber.) 11 claims.

1,022,502. Gas Engine. James H. Pierce, Bay City, Mich. Filed March 5, 1909. Serial No. 481,295. (Double water jacket around exhaust port.) 5 claims.

1,022,538. Starting Device for Gas Engines. Carl E. Dunham, Maddock, N. D. Filed April 18, 1911. Serial No. 621,850. (Acetylene starter.) 15 claims.

1,022,622. Lubricator. Howard E. Coffin, Detroit, Mich., assignor to Chalmers-Detroit Motor Co., Detroit Mich., a corporation of Michigan. Filed June 26, 1909. Serial No. 504,538. (Differential pump maintains constant level in the crankcase.) 3 claims.



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Money Cannot Buy Better Materials Nor More Elegant and Completely Equipped Car

Long stroke (4⅞ x 6) flexible and noiseless Motor with enclosed valves.
Left Side Drive.
Center Control.
Gray & Davis Electric Starter, easily operated by simply touching a button with foot.
Gray & Davis Dynamo Electric Lighting System.
Bosch dual double Magneto.
12-inch Turkish Upholstery.
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Powerful and reliable Brakes.
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Plain, continuous enclosed Metal Guards.
Easy riding qualities, unexcelled.
Oiling System, demonstrated to be only perfect oiling system.
Tools and jack in box concealed by splash on running board.
One extra Firestone demountable rim.

These few features are typical of the National's superior quality



Five Passenger Touring Car
One of five models, $2750 to $3400

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National Motor Vehicle Company, Indianapolis, Ind.

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The Warm Hand Wheel is an appeal to reason, good judgment and common sense and every dealer who reads this can realize its practical worth without extended argument.

The Warm Hand Wheel robs winter driving of half its unpleasantness by giving a rich, warm glow to hands that grow cold and numb even in heavy gloves. Think what this would mean to car owners in your territory if you would simply demonstrate it.

Now don't get the idea that it is impractical or complicated. Quite the reverse. It is just as simple as the electric iron, cook stove or the hundreds of devices that are heated by the current.

The Warm Hand Wheel is an economical consumer of electricity. It operates equally well from lighting systems or storage batteries. Ford owners will get splendid results from the current from the "built in" fly-wheel magneto. In brief, the Warm Hand Wheel is adapted to any modern car.

You, Mr. Dealer, can install it in a short time without interfering with any working parts of the car. Its installation is as simple as its function.

The Warm Hand Wheel sells at retail for $15. Write and let us tell you how well you will fare in the transaction.

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This is the way you look cranking a car by hand

Dignified position, isn't it?
You would look far more dignified and be better satisfied with yourself and your car if you sat in your seat and allowed an Electric Self-Cranker to do the work for you.
The Storage Battery is the heart of Electric Cranking and Lighting Systems.
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Elyria-Dean



Elyria-Dean Magneto--A Better Kind Than You Have Known

The new Elyria-Dean ignition system gives a kind of service to the car owner unknown with any other system. The Elyria-Dean magneto employs high frequency, high tension, electrical discharges, instead of the ordinary high tension discharges used in other ignition systems.

This high frequency spark gives a new life and energy to the ignition, a feature much sought after by the intelligent car purchaser or owner.

It ignites the gas instantly, even with poor mixtures and gives complete and rapid combustion of large volumes. This means more power from your motor; it means quicker and more reliable power and a satisfaction that comes only with the best kind of ignition.

With the Elyria-Dean ignition system, wider spark plug gaps are permissible than with other systems and the disruptive action of the spark prevents fouling of the plugs. Ordinarily, plugs never have to be removed, except for mechanical breakage.

High cylinder pressures have less effect on this spark than on other ignition sparks.

"Self starters" are made successful on magneto ignition as effective sparks are obtained at very low speeds, below 50 R. P. M.

No missing of the motor with the Elyria-Dean, even at the lowest speeds. All wiring carries low voltage currents, as the little resonator coils at the plugs step-up the pressure just where it is used. This obviates leakages and the maintaining of high insulation in the magneto, switch and connecting wiring.

The exclusive manufacturing license has been granted us under the Seeley patents and pending applications, giving us the legal rights and only practical methods of applying high frequency currents to automobile ignition.

Manufactured only by

The Dean Electric Company

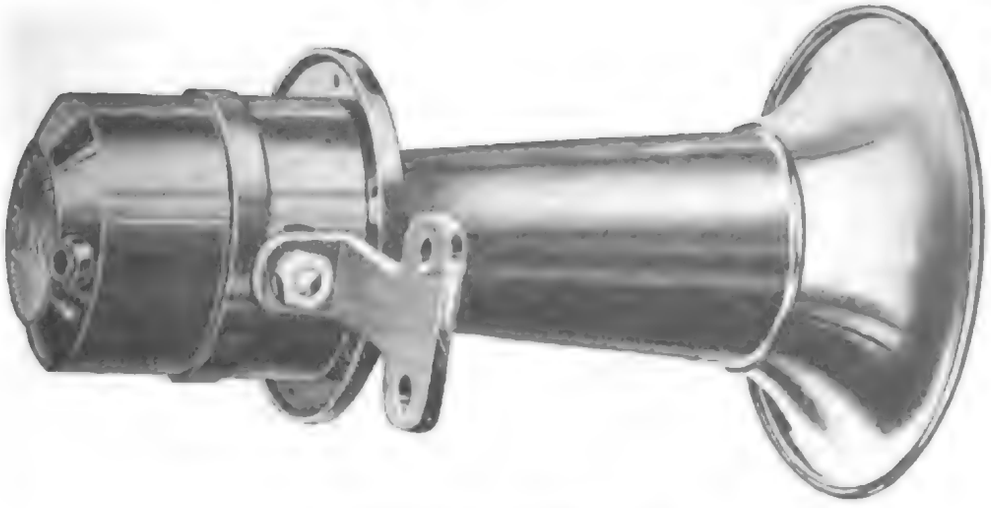
Electrical Apparatus

San Francisco — Elyria, Ohio, U. S. A. — Kansas City, Mo.

"Look for Elyria-Dean where quality's seen"

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Elyria-Dean



REXO HORN
Electric Warning Signal

A "Standard Equipment Horn"

We have already sold over 65,000 Rexo Horns for 1913 cars. When you see a REXO on a car it means that the maker of that car is willing to hitch up his car's reputation with REXO reputation and take our word for it.

45,000 REXO Electric Horns of special design are specified by one car maker, the largest electric horn order ever placed.

The Electric Warning Signal will be standard equipment on practically every automobile marketed in 1913, and most of the earlier models will be brought up to date by the installation of an efficient electric horn by the car owners. We know this to be a fact for our mammoth sales of the Rexo, Tuto and Tuto-Ette Electric Horns to automobile manufacturers and jobbers is the most conclusive evidence.

Rexo Features

The sound of the REXO is loud, abrupt, clear and unlike the motor driven horn; it is **instantly responsive.**

The standard REXO horn is designed to operate from any 6-volt battery and the current required is never over 1.8 amperes. The REXO does not contain **any moving parts which require tri-weekly lubrication, monthly overhauling, washing in gasoline, greasing, etc., nor is there any danger in clogging from dust or moisture.** The operation is equally as positive in winter as in summer, as there is no oil or grease to congeal, etc.

The REXO requires no care or attention during the full season of running and only a very slight adjustment is necessary to overcome a full season's wear, and this can be done in a few minutes and with an ordinary screw driver, as there are no delicate parts which can be damaged.

Rexo Horn—complete with button and cord, **$8.**

At the New York Shows

REXO Horns and other Elyria-Dean products will be exhibited in space 305, Concert Hall, Madison Square Garden, and in Space 225, Balcony, Grand Central Palace.

Manufactured only by

The Dean Electric Company

Electrical Apparatus

San Francisco — Elyria, Ohio, U. S.A. — Kansas City, Mo.

"Look for Elyria-Dean where quality's seen"

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Elyria-Dean



Elyria-Dean Speedometer

Simple and Always Accurate

The Elyria-Dean Speedometer has the most modern features of any speed measuring device on the market.

It has real speedometer value, easy reading, steady hand, permanent accuracy, lasting strength, neat design and handsome finish.

The dial is black with white markings; the case is beautifully finished in baked black enamel with nickel trimmings.

The hand is steady and shows the speed at a glance by its position. No need of laboriously deciphering the figures or markings as in other speedometers.

The cup is shaped so that a long scale of uniform division is obtained direct. No need to guess at the reading or doctor the scale.

The Odometer—Geneva type—is exceptionally reliable. Trip scale reset to the tenth mile, which facilitates following guide book markings.

It always adds mileage whether the car goes forward or backward, or whether shaft is driven from right or left hand wheel.

The Elyria-Dean Speedometer operates on the unvarying principle of direct centrifugal force. No compensating gears, springs or other parts to hamper or reduce accuracy.

The accuracy is unaffected by weather conditions. It registers the same in winter and in summer, in rain or in shine. No regulation or compensation required.

This elegant instrument is the proper equipment for the highest-priced and most luxurious motor cars. See it and other Elyria-Dean Products at the New York Shows.

Manufactured only by

The Dean Electric Company

Electrical Apparatus

San Francisco — Elyria, Ohio, U. S. A. — Kansas City, Mo.

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The Atwater Kent Ignition System

DEALERS and REPAIRMEN

HERE are a few good Atwater Kent "talking points." You can make them make you money.

Its simplicity of mechanism—no vibrators, relays, or commutator—just one contact point regardless of the number of cylinders and only three moving parts, none of which are subjected to excessive wear.

Its single adjustment easily and quickly made and seldom requiring attention.

Its adaptability and easy installation on any standard make of motor, new or old.

It is ideal for use in connection with lighting and starting equipment as it produces a hot dynamic spark, perfectly timed regardless of the engine speed.

While the Atwater Kent System is high in value and reputation, it is not high in price. In fact, it will cost less than half as much as a good magneto and will give superior results at a much less cost of upkeep.





There are now two types of Atwater Kent Ignition equipment—standard **Type F** and the new **Type K,** the latter having the automatic spark control and insulated primary circuit features.

PRICES OF THE TYPE F SYSTEM

	Standard Coil.	Kick Switch Coil.
1-cylinder	$17.00	
2-cylinder opposed	18.00	
2-cylinder distributor type	22.00	$24.00
3-cylinder distributor type	25.00	27.00
4-cylinder distributor type	25.00	27.00
6-cylinder distributor type	27.00	29.00

PRICES OF THE TYPE K SYSTEM

	Standard Coil.	Kick Switch Coil.
2-cylinder	$32.00	$35.00
3-cylinder	35.00	38.00
4-cylinder	35.00	38.00
6-cylinder	37.00	40.00

In substituting the Atwater Kent System for the magneto or for driving it from any horizontal shaft or gear, we furnish a special magneto gear mounting, the additional price of which is $5.00.

You will have many inquiries for ignition equipment during the coming year and should be in a position to recommend the Atwater Kent whenever the most efficient ignition is desired.

Seize the opportunity and post yourself by a visit to our exhibit No. 140 Madison Square Garden Show, New York City, or write for our booklet "D."

ATWATER KENT MFG. WORKS

4934 Stenton Ave. Philadelphia, Pa.

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An Active Journal Covering an Active Field

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THE OLDEST AND MOST INFLUENTIAL CYCLING JOURNAL IN THE WORLD

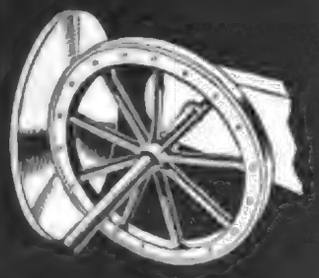
THE BICYCLING WORLD (FOUNDED 1877) and MOTORCYCLE REVIEW

Published Every Tuesday

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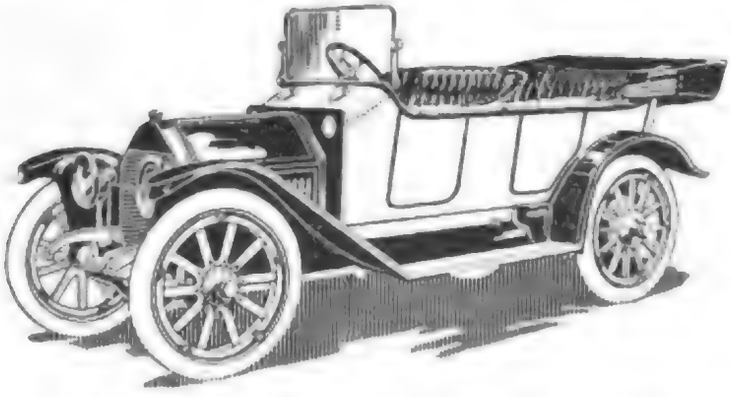
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Bicycling World Company
1600 Broadway
New York City



The Gearless Transmission!

This is the car that will give you the best possible service under all conditions, because of the efficient and strong transmission. The Cartercar is strong just where the ordinary car is weak. Your Cartercar is simple, easy to drive, and always ready to go.



Greater Efficiency

A Cartercar has an unlimited number of speeds—one lever control—and will easily climb a 50 per cent. grade. The transmission is composed of only two unit parts—which must mean great reliability. Just consider what these features must mean to you.

Greater Tire Mileage

The Tires on your Cartercar will wear about twice as long as on a gear car. This is because the transmission eliminates all jerks and jars in starting and changing speeds.

Electric Starting

Whether the weather is warm or cold, all you have to do to crank the motor is merely push down a small knob. Then turn this same knob and you light all or just as many of the lamps as desired.

Four Excellent Models

The new Cartercar line includes four extremely good models—Touring Car, Roadster, Coupe and Sedan. They are finished elegantly, with unusually deep upholstering and attractive lines. The prices range from $1600 to $2000—with complete equipment.

All at the Big Shows

Cartercar

Cartercar Company

Pontiac, Mich.

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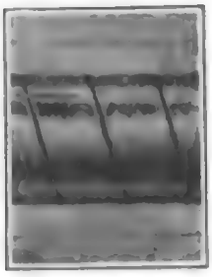
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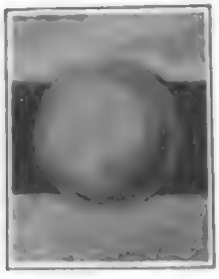
Another Prominent User of Hyatt Roller Bearings



Mr. Wm. Kelly, Chief Engineer, Flanders Motor Co.

Hyatt Quiet Bearings





LINE CONTACT is the basic principle of the Roller Bearing as against Point Contact of the Ball. There results a vastly increased surface to support the load, reducing the duty per unit section of the operating parts and increasing their life in a like proportion.

To insure this condition, uniform distribution of load is essential. This necessitates perfection in the manufacture and mounting of the bearing. Perfection is unattainable under manufacturing conditions.

The flexibility of the Hyatt Roller absolutely insures full line contact, hence guarantees uniform distribution of the load.

Flexibility is an exclusive feature of the Hyatt Roller.

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¶ At "Show time" every manufacturer wants his car to look at its very best. It is interesting to note ***how many*** of the high priced cars are equipped with Warners.

¶ Watch and see.

These cars are Warner equipped

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Marmon
Matheson
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Packard
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Vera Six

The Warner Instrument Company
Beloit, Wisconsin



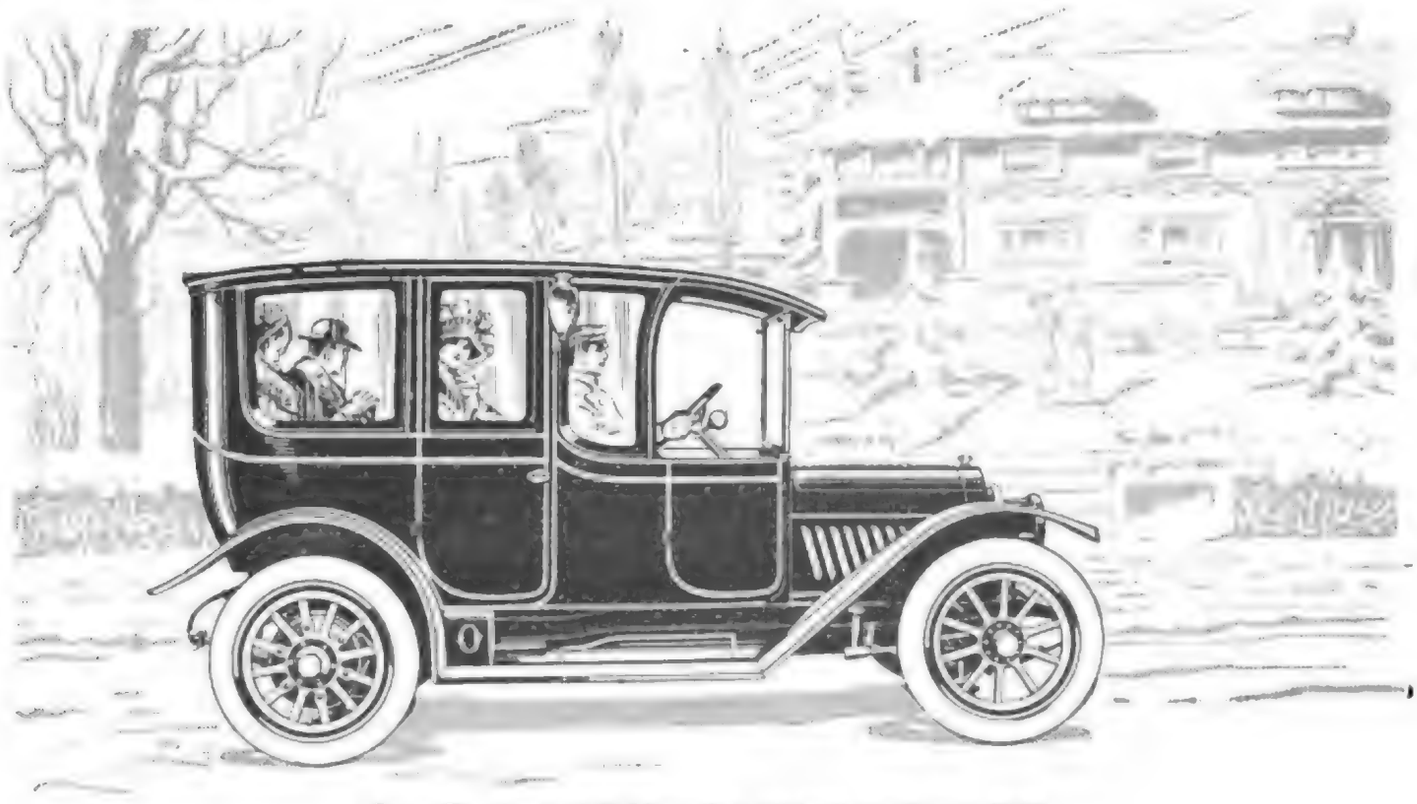
Model O-2
Price $145

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Beauty, Style, Luxury and Comfort Unsurpassed

The 44-50 Limousine and 34-40 Coupe are designed along rational lines. They are inherently beautiful. They possess the natural, easy grace that characterizes all Abbott-Detroit models. Beauty is not found in extravagant lines and designs. The beauty of a perfect horse could not be improved by giving it a camel's back or some other exaggerated form. The artist finds the simplest lines the most beautiful.

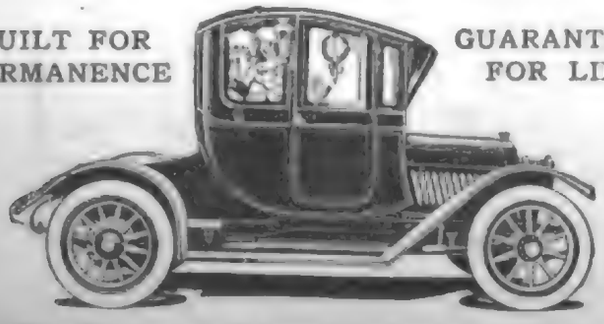


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Abbott-Detroit cars show the highest good taste. In keeping with our slogan, "Built For Permanence" and "Guaranteed For Life," they will remain the ideal car season after season. Like a man's derby hat, they will mark the standard of good taste while other styles come and go. Abbott-Detroit models are to the automobile world what Grecian architecture has always been to the world of art. They are the ambition and exasperation of countless imitators.

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GUARANTEED FOR LIFE



Three-Passenger 34-40 Coupe, 116-inch wheel-base, $2000

To sink in the luxuriant 12-inch cushions is equal to the greatest comforts of the home. Nothing in the way of convenience and comfort has been overlooked. The equipment is the latest and best that money can buy. You have everything that can be found in the highest priced foreign cars.

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Powerful, Silent—Long Stroke—Continental Motors, Electric Lights and Generator, Electric Self-Starter, Underslung Spring Construction, Oversize No-Rim-Cut Goodyear Tires, Booth Demountable Rims, 12-inch Turkish Roll Cushions, Piano Finish and Scores of Other No Less Important Features.

Let us tell you about these splendid winter cars.

ABBOTT MOTOR COMPANY

1607 Waterloo Street, Detroit, Mich.

The Largest Automobile Supply House in America

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at the

AUTOMOBILE AND MOTOR BOAT SHOWS

We are now collecting data for our 1913 Annual Catalog, which will contain 256 or more pages and will have a circulation of not less than 100,000 copies throughout the world.

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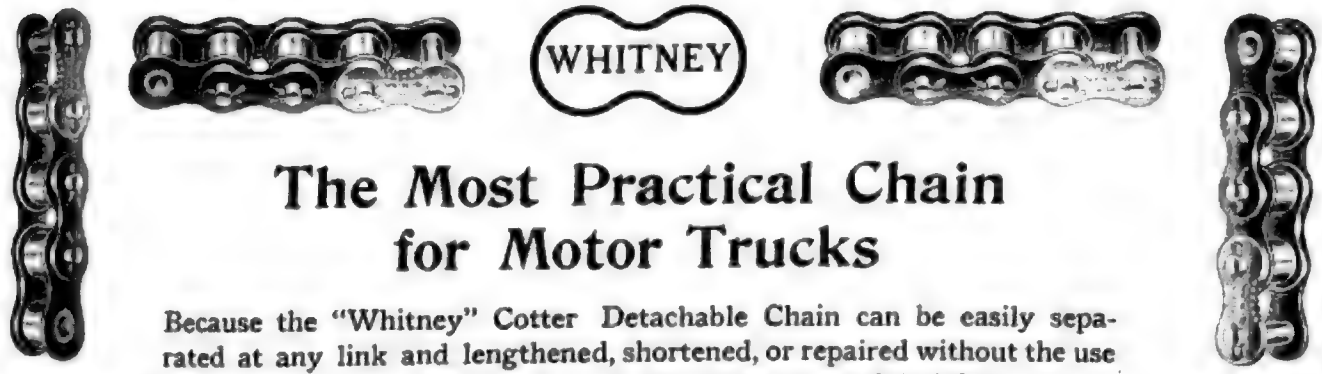
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Because the "Whitney" Cotter Detachable Chain can be easily separated at any link and lengthened, shortened, or repaired without the use of any special tool. This is of great advantage to truck builders, owners and drivers.

"Whitney" Chains are used by the leaders because they are strong, accurate, dependable and above all long lived. They are made right and they're made from the right kind of material, thus giving highest efficiency. When making replacements insist on a "Whitney."

"Whitney" Chains Are Built for Strains

THE WHITNEY MFG. CO., Hartford, Conn.



1913 Motorcycle Shows

and what the Bicycling World and Motorcycle Review will do in connection with them.

New York Show

will be held in connection with the Automobile Board of Trade Annual Show in Grand Central Palace, under auspices of the Motorcycle Manufacturers' Association

January 11-18

We will publish two big issues in connection with this show.

New York Forecast Number
January 7

New York Report Number
January 14

The Chicago Show

will be held at the Manufacturers' Exhibition Bldg., 1319 Michigan Avenue, and will be conducted under the auspices of the Motorcycle Manufacturers' Association

February 3-8

Two special issues will be published descriptive of this show.

Chicago Forecast Number
February 4

Chicago Report Number
February 11

We are ready now to book reservations of space for all or any of the four above described numbers of **THE BICYCLING WORLD AND MOTORCYCLE REVIEW**, and our service department is now preparing copy and sketches for our advertisers' use in these big issues. Each of the Show Numbers will have extra circulation without increase in price of space and our regular advertisers may use extra space on their contracts at minimum rates. This is a splendid opportunity of which the entire trade should take advantage.

Copy and cuts can be handled one week in advance of each publication date, but we recommend reservation now and an early preparation of copy. Can we help you with this copy? And how much space can we reserve?

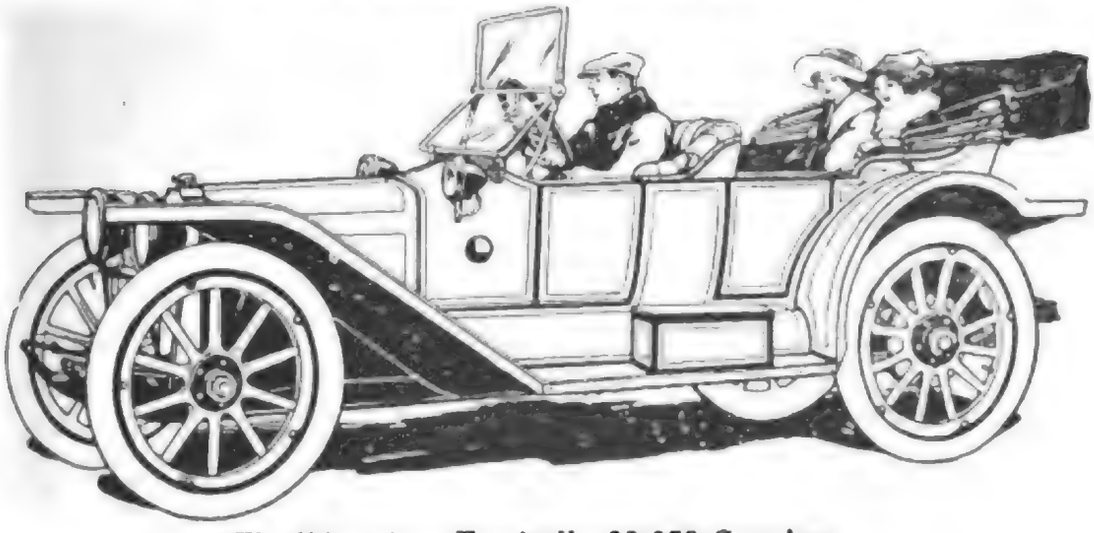
BICYCLING WORLD AND MOTORCYCLE REVIEW
1600 Broadway **New York**

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Electrically Lighted

AMERICAN UNDERSLUNG

Electrically Started



The "American Tourist"---$2,350 Complete

The most practical car to drive

"AMERICAN UNDERSLUNG"

Ninety-six per cent of the motor's power is transmitted by direct drive to the rear system.

The center of gravity is only 21.9 inches off the ground. Sidesway is decreased over 50 per cent. Strains are divided equally and control made positive at high speeds.

No danger of turning turtle. Right angle turns may be taken at 45 miles an hour.

"American Underslung" big wheels guarantee maximum comfort. Experiment on wooden floor cracks with a castor and a bicycle wheel.

"American Underslung" tires have a contact surface of 6 inches. The greater the contact surface the less tire wear.

Road clearance is 12¼ inches.

CONVENTIONAL OVERHUNG CAR

One-fifth—20 per cent—of the motor's strength is actually wasted by indirect drive.

The center of gravity is 30.2 inches off the ground —8.3 higher than in the underslung. Control at high speeds is extremely hazardous—strains unevenly divided.

Speed from 10 to 20 miles an hour less in order to guarantee equal safety.

Wheel size is limited. Therefore, comfort is a finite quantity.

Overhung cars have an average tire contact surface of only 4½ inches—30 per cent less than those on the "American Underslung."

Road clearance of 85 per cent of all overhung cars is 11¼ inches.

This is a bigger "American Underslung" year than ever. Get into communication with us today. See our big exhibits at the New York and Chicago shows.

The "American Traveler"---$4,500 Complete

The "American Scout"---$1,475 Complete

American Motors Company, Dept. E, Indianapolis, Indiana

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In the fact that it may be attached to either the left or right wheel lies another distinct advantage of the

CORBIN-BROWN SPEEDOMETER

The Speedometer of *Permanent* Accuracy

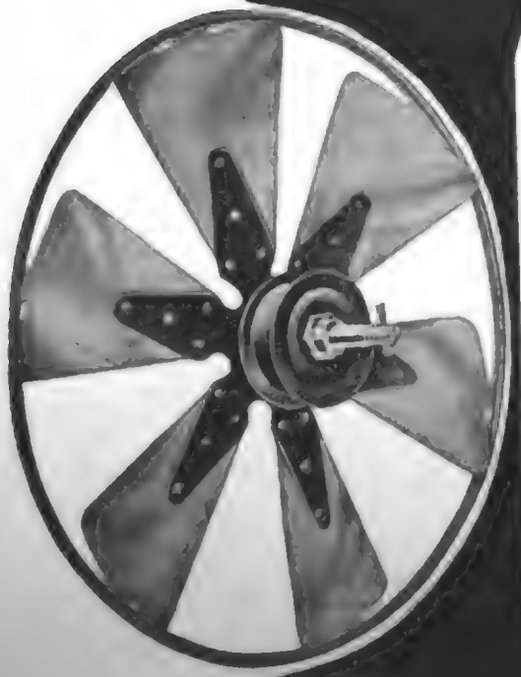
From the smallest runabout to the largest limousine its adaptability extends. Also calibrated low for trucks not to exceed 30 miles per hour.

Sold by leading garages and accessory dealers everywhere

CORBIN SCREW CORPORATION DIVISION

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1913 Fans

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Receiver's Public Sale
Tuesday, January 14, 1913, 2 p. m.

The plant of the Fitzgibbon & Crisp Carriage and Wagon Co., located in the heart of Trenton, N. J., including Land, Buildings, Machinery, Stock, Fixtures, Work Finished and Unfinished, and all Personal Property except Book Accounts.

The plant has been profitably operated by the Receiver since June, 1912.

Sold subject to a mortgage or lien of $40,000 represented by a bond issue maturing in 1922 (not in default) and (the Sinking Fund created for the retirement of the bonds is worth about $17,000). City Taxes due to amount about $2,000.

Terms: 10 per cent purchase price Cash, balance upon delivery of deed after Confirmation of Sale by Court.

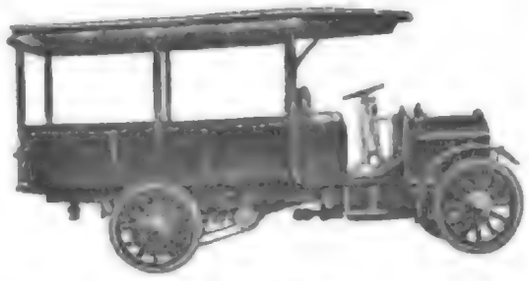
Further information upon application to Receiver.

A LIVE GOING ACTIVE PLANT

Receiver Fitzgibbon & Crisp Carriage and Wagon Co.

Trenton, New Jersey

The Selden Truck



$2000

(Price includes chassis with driver's seat, lamps and tools—body extra)

Don't be satisfied with only a moderately good truck, but get the best you can for your money.

The Selden One-Ton Truck affords infinitely greater value than any truck in its class. A detailed comparison with other trucks will convince you of this fact.

The Selden Truck, like any structure which is the product of skillful, competent engineers, is built with a large factor of safety. In other words, the Selden Truck is built without any structural weaknesses, and is made to withstand the stresses and strains of hard, constant service without injury or undue wear.

It can be bought on time payments by those who do not find it convenient to pay cash, and is therefore, available to thousands of concerns that have been waiting for just such an opportunity to add to their business organization, the only efficient and economical means of distribution and delivery.

We have some valuable territory open for live responsible dealers who want to increase their profits by taking on the best selling proposition ever offered.

Write at once and get the details of the Selden Truck and of our selling plan, and give us particulars regarding your sales and service facilities.

We will exhibit at New York and Chicago Shows
NEW YORK, January 20-25, Madison Square Garden, space 111 A.
CHICAGO, February 10-15, Coliseum, Section A.

SELDEN TRUCK SALES CO.

179 East Avenue, ROCHESTER, N. Y.

BOYCE
MOTOMETER
PAT'D PEND'G

1913's TRADE SENSATION

Know the Exact Heat of Your Motor While Driving



(Front view ½ actual size.)

The Motometer is a watchlike instrument fitted to the radiator cap, protecting the motor from damage caused by improper lubrication, overheating, defective cooling, etc. By means of a red fluid indicator it warns you.

When the Radiator Needs Water

When Oil Supply Is Insufficient

In short, it tells whatever excessive heat tells—a broken water pump, a clogged pipe, a broken fan belt, etc., and tells before the damage is done. Attached the same as an ornament, readily visible from the seat day or night. It will prevent frozen radiators in winter and cracked cylinders in summer.

Finished in black enamel with gold plated or nickel rims.



Price $10

View from Seat

The Motometer Company, Inc.
904 U. S. Rubber Bldg.
Broadway and 50th Street, New York

Exhibiting—Madison Square Garden Show, Space 540, Basement

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HENDERSON

Every Henderson Car Must Pass These Rigid Tests

When you buy a Henderson, you can be assured that it is **right**—that it has passed the rigid scrutiny of the Henderson Engineering Corps—and that the Hendersons of Indianapolis stand back of it.

Every part of the Henderson is carefully examined and tested and the result noted on production tags as shown herewith. The foreman in charge of each department is responsible for seeing that each car leaves his hands in a thoroughly satisfactory condition. Then the car complete is tested—and each and every detail of construction and finish is gone over carefully. You know what a rigid examination of this kind means.

All Models on One Standard Chassis

MODEL 44
Two Passenger Wood Wheel Roadster.....$1385

MODEL 45
Two Passenger Wire Wheel Roadster.....$1485

MODEL 46
Five Passenger Wood Wheel Touring Car.....$1485

MODEL 47
Five Passenger Wire Wheel Touring Car.....$1585

Including top, windshield, speedometer, and Disco Self Starter as noted below.

WARD LEONARD ELECTRIC SELF STARTER
in place of Disco on above models, $100.00 additional.

Note These Henderson Specifications

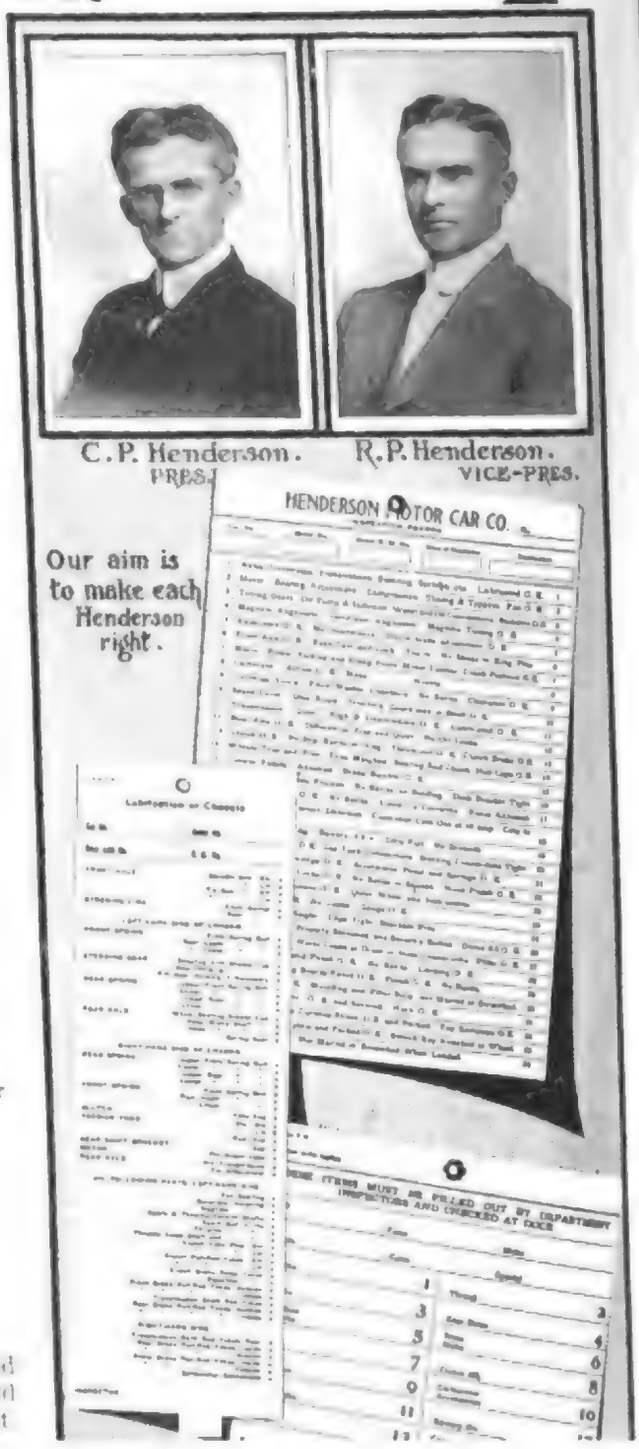
Dynamo Electric Lights.
Disco Self Starter.
Left Hand Drive.
Single Lever Center Control.
Long Stroke 4⅛ x 5¼ Silent Motor.
34 x 4 in. Tires.
116 in. Wheelbase.
Demountable Rims.
Nickel Trimmings.
Stutz Rear System.
Gasoline Tank Under Dash Cowl.
Three Point Suspension.
Imbedded Dash Lamps.
Silk Mohair Top and Top Boot.
$50 Model B Stewart Speedometer with Grade Indicator.
One Piece Ventilating Windshield.
Robe and Foot Rails.
Completely Equipped.

Henderson De Luxe Models

MODEL 48
De Luxe Wood Wheel Touring Car.....$1685

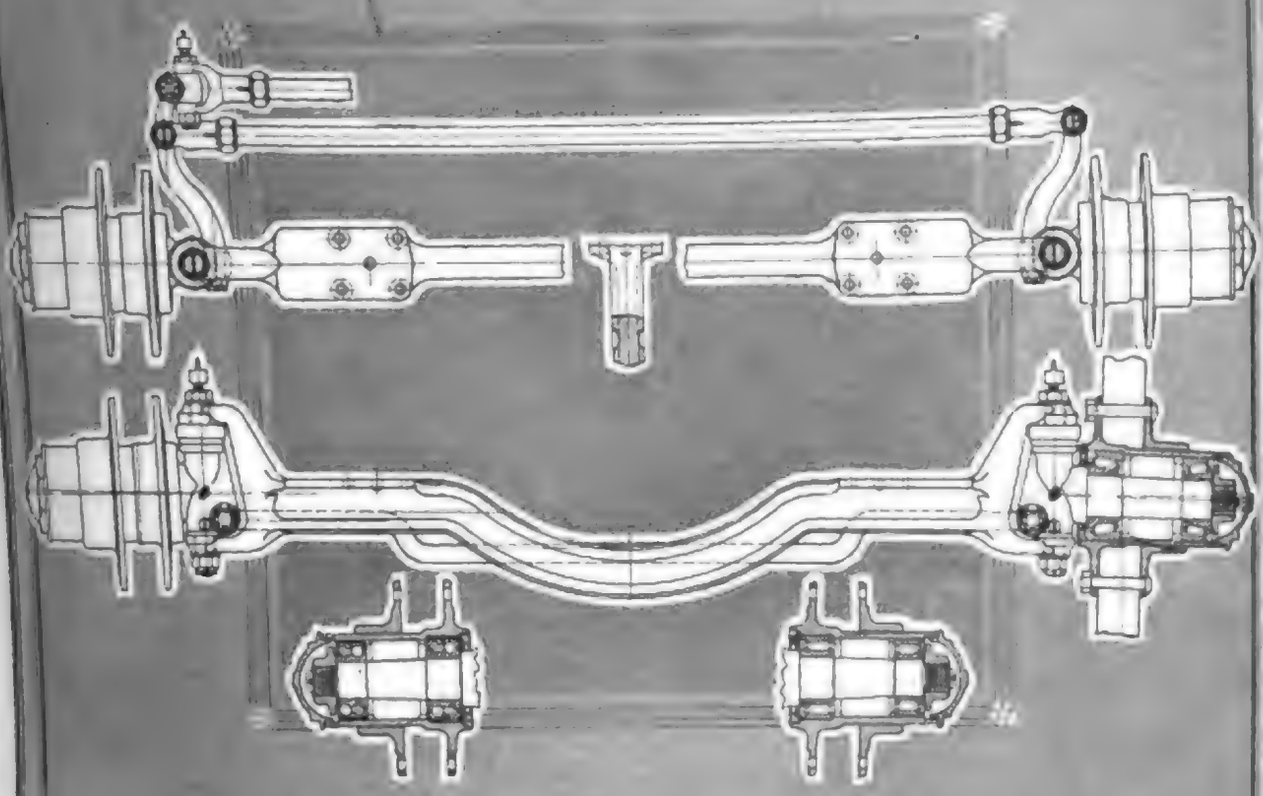
MODEL 49
De Luxe Wire Wheel Touring Car.....$1785

These new De Luxe models have more room in the tonneau and added features of refinement. De Luxe prices include Ward Interesting details sent on request



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One of the SHELDON FRONT AXLES for Heavy Service



Another member of the famous Sheldon line, even more perfect than its predecessors—this is one of the Sheldon Front Axles for heavy service.

No better forging has ever been turned out in any plant. The spring pads are ample in area and are forged integral with the axle. This axle is not welded in the middle. The steering knuckles are reinforced to ensure greatest strength and safety, and perfect lubrication has been attained by efficient oil cups. We offer this axle to manufacturers with their choice of the following bearing equipment:

New Departure Double Row Annular
Standard Taper Roller
Bower Straight Roller
Rhineland Double Row Annular
Any standard double or single row annular bearing is interchangeable with these axles and hubs.

SHELDON AXLE COMPANY, Wilkes-Barre, Pa.

CHICAGO OFFICE, 68 East 12th St. DETROIT OFFICE, 1215 Woodward Ave.

BENZ

Since the introduction of BENZ cars to the motoring public of America no car has attained such world-wide supremacy as to its construction, standing up quality, and material The new type of 35 and 50 H. P. BENZ models are the last word in automobile construction.

The noticeable features of this type of BENZ cars include the offset crank shaft, smokeless oiler, and SILENT CHAINS instead of timing gears.

The BENZ Carrosseries are noted for their beautiful lines and thorough comfort.

To those desiring AGENCY of this car the Benz Company will offer special terms. We want RELIABLE, ENERGETIC agents to further our interests for both BENZ pleasure cars and BENZ-GAGGENAU trucks, which today stand recognized by those who know, as the leading 6-ton truck. Wire or write us, no matter where you are.

Our PRICES compete with LEADING AMERICAN makes.

BENZ AUTO IMPORT COMPANY OF AMERICA

250 West 54th Street New York, N. Y.

Direct Branch of Benz & Cie., Mannheim, Germany.

TIRE ECONOMY
IS MEASURED BY
TIRE INFLATION

You Carry Tire Insurance When You Carry A

Schrader Universal Tire Pressure Gauge.

AND USE IT.

ASK YOUR TIRE MAKER.

For Sale by Tire Manufacturers, Jobbers, Dealers, Garage Men and

A. SCHRADER'S SON INC.

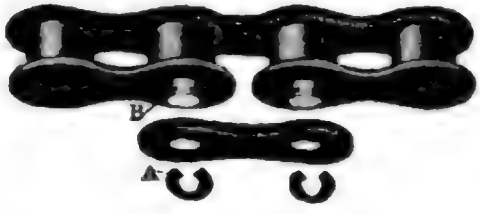
33 Rose St. New York

PRICE $1.00



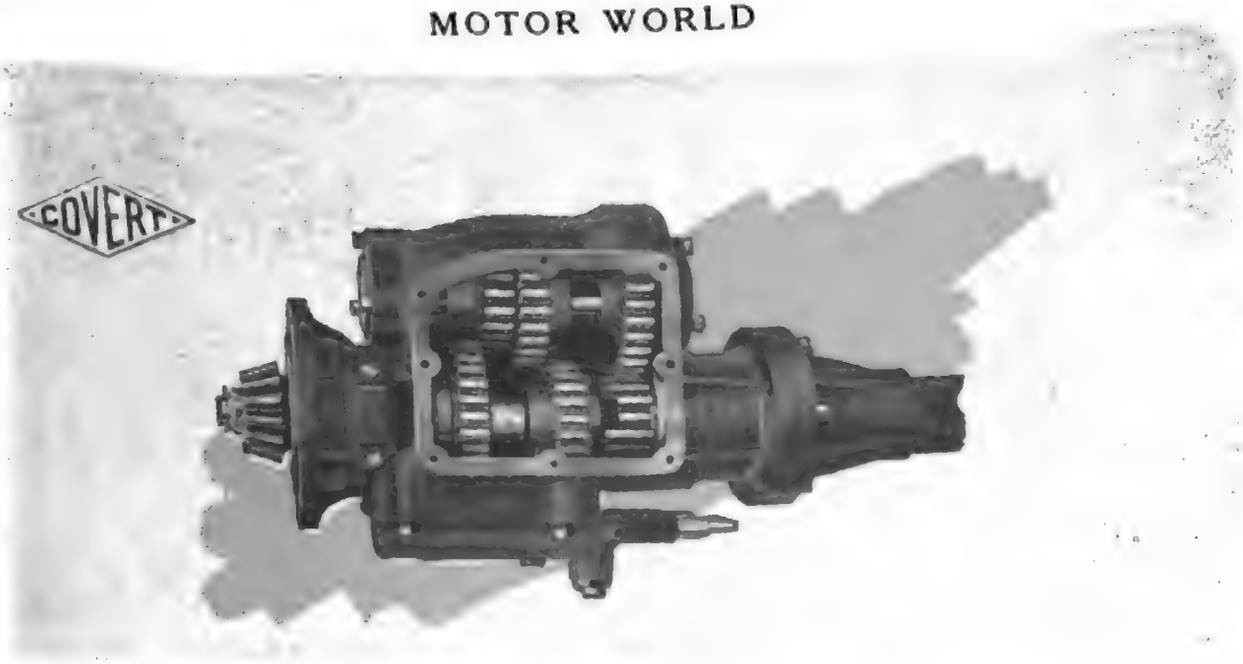
Ford
THE UNIVERSAL CAR

It's the light weight champion of the world. In a fair and open fight the sturdy Ford has won its title—and holds it—because it has more strength for its weight.



Baldwin Drive Chains

Both detachable and riveted, are used by the largest most exacting users of chains for automobiles in the world. They need no further recommendation.



A Certainty In Transmissions!

Because experience teaches, we are, unquestionably, at the head of the Transmission class. It would be a severe reflection upon our mechanical aptitude to doubt our ability to build the very best possible transmission.

Our pre-eminent position today as transmission specialists was not attained without travail. We, like all who must learn largely by experience, have had our problems. Why should you go over the same road when the finished product can be had for less than it would cost you to build?

Also, we have our triumphs, and the greatest of these is the fact that once secured, we do not lose an account. Our 1913 business is now actually twice that of the past year, which was a record breaker.

Covert Motor Vehicle Company

Factory: Lockport, N. Y.

Sales Office: 1422 Ford Building, Detroit, Mich.

COVERT

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Prest-O-Starter

Starts your engine (old or new) quickly and easily in coldest weather

For Four Cylinders $20

For Six Cylinders $25

$1.50 extra for two-way valve necessary when the same tank is used for both starting and lighting.

Here's a starter that adds practically no weight to your car, is perfectly simple and is as durable as the engine itself. Easily applied to any engine, old or new, very economical in the use of gas, and requires no expert repairing.

How Prest-O-Starter Works

The principle of starting a motor with Prest-O-Starter is the same as "starting on compression." A measure of acetylene, at low pressure, is pumped from your Prest-O-Lite tank into the cylinders.

Touch your spark—your engine starts

Unlike "gasoline priming," it is not affected by heat or cold. It is certain.

In cool weather, by opening a valve on the dash, you can feed gas at low pressure into the intake manifold. This allows your engine to run on acetylene until it is warm enough to run on gasoline.

If the Prest-O-Starter did no more than prime your engine in this way during cold weather, this convenience would be well worth the price.

But Prest-O-Starter is more than a primer. When installed properly, it will start your engine, summer or winter, almost invariably without recourse to the crank.

Make Sure Your Starter Is Installed CORRECTLY—Look It Over

The Prest-O-Starter is easy to install correctly. In fact, it's so very easy to install that some good factories and garages install it with utter carelessness, overlooking the one or two simple features vital to success in operation. Fortunately this is an easy matter for the car owner to correct, even if he isn't a mechanic.

Our literature tells you exactly how the Prest-O-Starter is installed, and how to adjust it. Anyone can give it the slight attention it may need or quickly tell a dealer where the trouble lies.

Every Prest-O-Starter is sold with the assurance of satisfactory service. The entire Prest-O-Lite Organization is back of every one. If you have any trouble, report it to us or to our nearest branch. We'll wipe it out quickly.

Insist Upon GETTING the Outfit COMPLETE

During warm weather the connection which feeds acetylene into the intake manifold is not needed. So some dealers are not installing it. But in cold weather this feature is vital. You're entitled to it. It's included in the price, so see that you get it.

Now—More Than Ever—You Need One

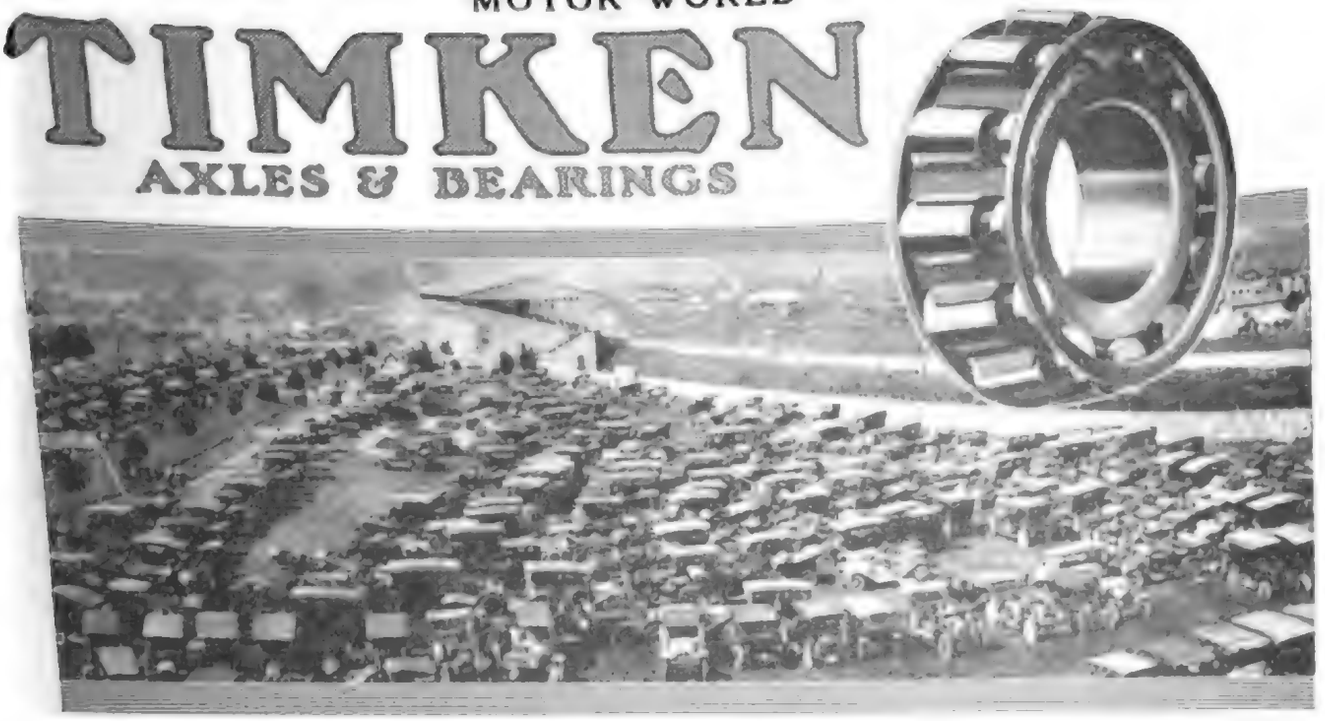
Your Prest-O-Starter, properly installed will average better than 95 starts out of 100 attempts. The few failures are caused by your motor stopping on dead center, or cylinders filled with burnt gas. Both of these conditions can be easily avoided when stopping your motor. But should either or both happen, an eighth or a quarter turn of the crank, with the switch at neutral, will remedy the trouble at once, with all the danger and labor of



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MOTOR WORLD

TIMKEN
AXLES & BEARINGS



Read Your Answer in the Cars

DO Timken principles of axle and bearing construction work out in practise? Are their merits acknowledged by the leading motor-car builders?

These questions are natural and just. You have read the Timken stories of axle and bearing importance in previous advertisements.

You have felt, as you read, that Timken principles were right, that they must have proved right on many a steep hill and stony road.

Nor did you err, for hundreds of thousands of Timken-equipped motor-cars, pleasure and commercial, are daily demonstrating the worth of Timken principles and Timken construction.

At the points of severest service—there you are most likely to find Timken Equipment

Because front axles and the bearings on their spindles must stand up to the tests of every day travel and meet the emergencies, builders of good cars dare not take chances at these vital points.

On the right are listed nearly all of the cars using Timken Tapered Roller Bearings and Timken-Detroit Axles. Among them, you will agree, are most of the best known and highest grade cars made in the country.

All of the makes of cars listed here use Timken Bearings or Axles on one or more models, throughout or in part.

To be specific, 97½% of all these cars have Timken Bearings at the points of severest service—on the spindles of the front axle.

In addition to that, 94½% of the entire list have Timken Axles or Bearings at all or some of the following points: rear axle, rear wheel bearings, differential and pinion-shaft bearings, transmission bearings, commercial rear axle and jackshaft, and their hubs and bearings.

Also 61½% of the pleasure cars and 72½% of the commercial cars listed at the right have Timken-Detroit Axles, front or rear or both.

Coming back, then, to the questions, "Do Timken principles of axle and bearing construction work out in practise? Are their merits acknowledged by the leading car builders?

You can read your answer in the cars.

A Timken-Detroit Front Axle for Pleasure Cars

On the spindles and bearings of the front axle are concentrated the severest shocks, stresses and vibration of motor car service.



THE TIMKEN ROLLER BEARING CO.
Canton, Ohio

THE TIMKEN-DETROIT AXLE CO.
Detroit, Mich.

Below are listed most of the cars using Timken Tapered Roller Bearings and Timken-Detroit Axles throughout or in part:

PLEASURE CARS

Abbott-Detroit — Ampleх — Atlas-Knight — Bartholomew — Buffalo Electric — Cadillac — Case — Chalmers — Chicago Electric — Colby — Cole — Columbian — Columbus Electric — Crawford — Cunningham — Detroit Electric — Diamond-T — Dorris — Edwards — Flanders — Franklin — Great Eagle (U. S. Carriage Co.) — Haynes — Kissel-Kar — Knox — Lexington — Locomobile — Lozier — Marion — Marmon — Maxim — Mason-Scaman Taxicab — Matheson — Maxwell Special — Middleby — Mitchell — Moline — Moon — Mover — National — Overland — Packard — Palmer-Singer — Peerless — Pierce-Arrow — Pope-Hartford — Premier — Pullman — Ralch & Lang — Reo — Reo (Canada) — Russell (Canada) — Shaw Taxicab — Simplex — Speedwell — Stafford — Stanley Steamer — Stearns-Knight — Stoddard-Dayton — Stutz — Thomas — Tuttlope (Canada) — Velie — Walker — Waverly Electric — Westcott — Winton — and many others.

COMMERCIAL CARS

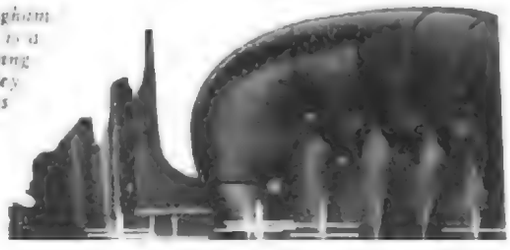
Ahrens-Fox Fire Engine — Alco Truck — American-La France Fire Apparatus — Atlantic Electric — Atterbury — Autocar — Avery — Baker Electric — Bessemer — Bronx — Cass — Commercial Truck of America — Dayton Auto Truck — Detroit Electric — Dorris — Federal — Four Wheel Drive — Garford — General Vehicle — Grabowsky — Gramm (Lima) — Gramm (Canada) — Gramm-Bernstein — Harrison — Hewitt (International Motor Co.) — Ice Mfg. Co. "A. I. C." — Kissel-Kar — Knickerbocker — Knox — Lansden Electric — Lewis — Lipsard-Stewart — Locomobile — Lozier — Mack (International Motor Co.) — Mais — Marathon — Martin — Mather Funeral Car — Moeller — Mogul — Moore — Moreland — Morgan — Oliver — Packard — Packers — Peerless — Pennsylvania R. R. — Pierce-Arrow — Pope-Hartford — Randolph — Rapid — Reliance — Reo — Rowe — Samson — Schacht — Seagrave Fire Apparatus — Speedwell — Standard — Sternberg — Stewart — Stewart Iron Works — Studebaker — Toledo — Transit — U. S. Truck — Universal — Velie — Victor — Vulcan — Walker — Ward — Waterous Fire Apparatus — Waverly Electric — Webb Fire Apparatus — Wilcox — Woodworth — and many others.

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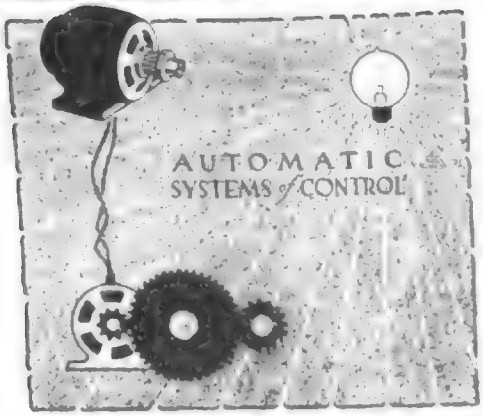


The LUXURIOUS BROC

Model 20, Rear-door Brougham for five passengers. Below is a part of the interior, showing Pedestal Front-seats. They provide ample roominess and the acme of comfort.



WARD LEONARD



Lighting - Starting

The best cars of 1913

will have Ward Leonard Systems

The Ward Leonard Electric Self Starter was perfected and protected by patent applications when the leading automobiles of America were running with single cylinder motors and a two-speed single chain drive with the motor under the driver's seat.

Just think of it!

The only reason why Ward Leonard Lighting and Starting Systems are not in universal use is that we have been ultra-conservative.

We have always aimed at quality. We had the invention. It has undergone years and years of evolution and improvement, and to-day we have improved our facilities and increased our output.

Hereafter Ward Leonard quantity will be as well known as Ward Leonard quality.

WARD LEONARD ELECTRIC CO.

BRONXVILLE, N. Y.

WARD LEONARD

Faultless Service

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The CAR that MOVES

is the One Whose Motor the Public Wants

After all, what is a Car or Truck? Nothing but an "assembly of accessories." Whether it is a "Good Buy" and an "Easy Seller" depends upon whether these accessories are *selling force* or *dead weight*, whether they are *parts that SELL THE CAR* or *merely parts of the car to sell.* It is a known fact that *one accessory* can *kill* a sale or *close* a sale. Many a car has been moved from the stock room by the

DIFFERENTIATIVE MERITS OF THE



Of course the basis of all public demand in the case of the BUDA rests finally on such exclusive points of merit as its "get-at-ableness," its special oiling device, the certainty of always being able to secure interchangeable parts and its demonstrated efficiency as is testified to by the following partial list of manufacturers for whom we have made motors:

Pleasure Cars:

Hudson Motor Car Co.
Michigan Motor Car Co.
Henderson Motor Car Co.
Lenox Motor Car Co.
Schacht Motor Car Co.
Spaulding Mfg. Co.
Croxton Motor Co.
Nova Scotia Carriage and Motor Car Co.
Miller Motor Car Co.
and others.

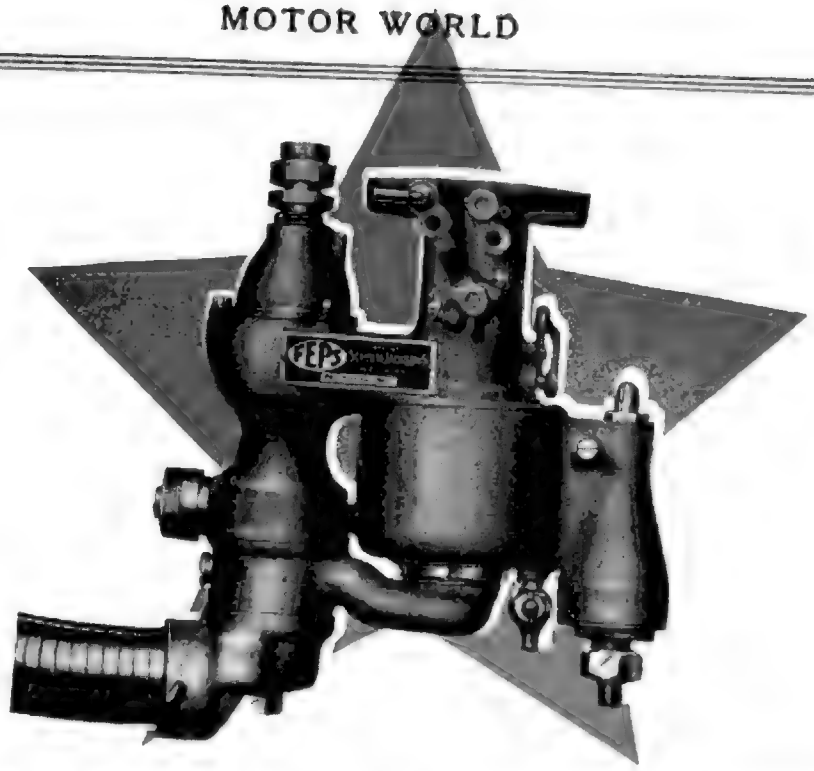
Trucks:

Service Motor Car Co.
Bowling Green Motor Car Co.
Durant-Dort Carriage Co.
Hewitt Ludlow Auto Co.
Tiffin Wagon Co.
Brantford Motor Truck Co.
W. Landshaft & Sons
Harvey Motor Truck Co.
Hartburt Motor Truck Co.
Schacht Motor Car Co.
Chicago Pneumatic Tool Co.
Lord Baltimore Motor Car Co.
U. S. Government and others.

The Buda "Little Six"

will be ready for delivery by April first and is a product worthy of the Company which was the Pioneer of the "Cast-in-Block" method in U. S.

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The FEPS CARBURETOR

"A GIANT IN POWER — A MISER IN FUEL"

THE Feps is a radical step forward in carburetor design. It involves a new principle of auxiliary air supply that produces a wonderful increase in flexibility, economy, power, and speed. It contains no springs, balls, cams, or reeds, and all adjustments once made are permanent.

The Feps delivers a mixture so accurately proportioned, and so thoroughly uniform at all speeds that an increase of from 25 per cent. to 50 per cent. in miles per gallon of fuel is easily attainable. The Feps embodies a new and efficient automatic priming device for quick-starting. Write today for interesting illustrative booklet.

See the Feps at the New York Shows

Madison Square Garden, Space 257, Balcony, Madison Avenue End
Grand Central Palace, Space 405, Balcony

Schoen-Jackson Company, Dept. H Media, Pa.

SINCE our announcement of the greatest of all tire improvements, THE OILPROOF FEATURE, last Fall, the demand for Pennsylvania Vacuum Cup Tires has forced us to forget that there is such a thing as a "dull season."

Following the previous waves of ever increasing popularity which had already doubled the season's business, came this greater wave in response to our Oilproof announcement.

The enthusiastic reception accorded to these improved tires by the motoring public and the trade alike was no surprise to us. But we did not expect the insistent demand to continue in increasing force right through these ordinarily lean months.

In spite of the energetic development of our producing resources our capacity is being taxed to meet this imperative call for Oilproof Vacuum Cup Tires. We are turning them out as fast as our stringent policy of careful manufacture will permit, and making extraordinary preparations for Spring. Dealers are finding "Oilproof" the magic sales word.

To Dealers: Get in your orders.

See Our Exhibits at Madison Square Garden, Southeast Corner Elevated Platform.



Pennsylvania Rubber Company

(Reorganized February 1, 1910)

JEANNETTE, PA.

Pittsburgh, 503 Liberty Ave.
Cleveland, 1837 Euclid Ave.
Detroit, 254 Jefferson Ave.
Chicago, 1004 Michigan Ave.
Minneapolis, 34 S. 8th Street
Kansas City, Mo., 514 E. 15th Street
Omaha, 215 S. 20th Street
Dallas, 411 S. Ervay Street
Seattle, Armour Bldg.

PENNSYLVANIA RUBBER CO. OF NEW YORK
New York City, 1700 Broadway
Boston, 149 Berkeley Street

PENNSYLVANIA RUBBER CO. OF CALIFORNIA
San Francisco, 512-14 Mission Street
Los Angeles, 930 S. Main Street

An Independent Company with an Independent Selling Policy



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If You Can Safeguard

Your Car --- Your Life

BY USING

TRADE MARK

Raybestos

REG. U.S. PAT. OFF.

"THE ORIGINAL AND BEST ASBESTOS BRAKE LINING"

Why accept inferior imitations of RAYBESTOS--- cheap substitutes that may fail in an emergency?

We can't make this too strong—nothing is so all-important as efficient brake lining—likewise nothing is so all-important as RAYBESTOS. Consider the accidents, the lives lost, the trouble due to faulty brakes.

You wouldn't put your faith in "quack" medicines if your life was in the balance—then why consider inferior brake lining?

On the hills, in traffic, at the crossing, your life and the lives of the occupants of your car are dependent upon the brakes. Don't take chances—don't flirt with danger. Demand RAYBESTOS lining as part-equipment on your car. If you need new lining tell your dealer or garage man to sell you RAYBESTOS.

MAKE THAT CAR OF YOURS A SAFE CAR!

See the ROYAL EQUIPMENT CO. Exhibit at the Automobile Show

Get acquainted with the best lining the automobile industry produces.



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"Little Knox Six"

Commands Attention

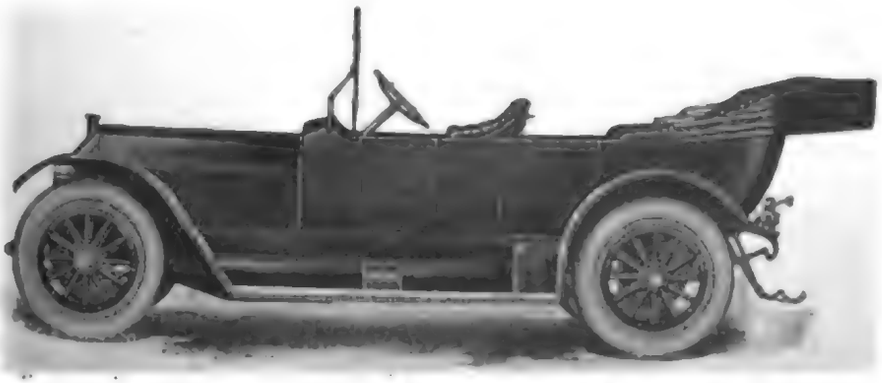
Arouses Enthusiasm

Silences Competition

Passes them all.

Made in New England

at Springfield, Massachusetts



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THE NATIONAL AUTO SHOW



Under Auspices of National Association
of Automobile Manufacturers, Inc.

At
CHICAGO
Coliseum and 1st Regiment Armory

February 1 to 8

Passenger Vehicles
Parts and Accessories

February 10 to 15

Commercial Vehicles
Parts and Accessories

If the front of your car never bumped into anything — YOU HAVE BEEN FORTUNATE.

IF NOTHING ever bumped or backed into the front of your car—you have been more fortunate.

AND IF YOU are sure that neither of these accidents can or will occur — then you do not need a Conover.

THE CONOVER means certain protection. It has the *stuff* in it; the strength; the shape; the support.

IT PREVENTS damage as does no other safe-guard.

IN ADDITION it presents an extremely distinctive appearance. It is in keeping with the finest fittings on the most expensive car.

Write for attractive booklet.



Best quality Steel, heavily enameled in Black, Royal Blue, French Gray or Maroon. One size only, bar 2 in. wide **$15.00**
(Any other color of enamel $5.00 extra)

Best quality Steel, Brass or Nickel plated. One size only; bar 2 in. wide **$17.50**

Solid Bronze finished in either Brass or Nickel. Two sizes, bar 2 or 2½ in. wide **$25.00**

Shipped by express paid anywhere in the U. S. on thirty days' trial, upon receipt of the regular price. When ordering give name and model of car and specify size and finish desired.



LOVELL-McCONNELL MFG. COMPANY
Sellers :: Newark, N. J.

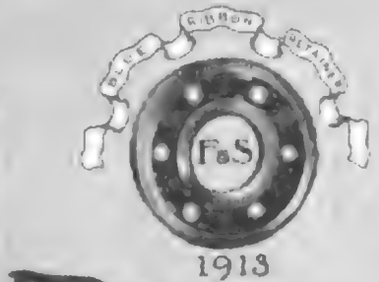
NEW JERSEY TUBE COMPANY
Makers :: Newark, N. J.

CONOVER

The Dependable Safe-Guard



Hors Concours



At the
LONDON
PARIS
NEW YORK
CHICAGO
1913
Shows

F&S Ball Bearings

J. B. BRETZ COMPANY
Sole Importers
New York City

Digitized by Goo

Champion Priming Plugs

Start Any Motor—In Any Kind of Weather

No matter how cold your car's cylinders,

CHAMPION PRIMING PLUGS

will start your motor on the first quarter turn.



Open needle valve slightly (you needn't remove glass) and inject gasoline. Passing through its own channel to plug base, it vaporizes directly at spark point.

You must prime your motor in the winter—there's no alternative.

Cold chills the gasoline; it won't expand upward.

You can't send the best possible spark down far enough to fire it.

Present low test gasoline makes the problem still harder.

Champion Priming Plugs produce a rich mixture **right at the firing points**—then shoot a hot, sizzling spark right into it.

You can't get the same results with priming cups: they can't be placed close enough to the spark plug.

The Champion Priming Plug combines a perfect prime-r and a perfect spark plug.

And it won't "soot up" or leak compression.

Champion Spark Plugs are regular equipment on nearly 70 per cent of the American cars today.

You can trust the good judgment that demands them for all the Fords, Overlands, Michigans, etc., etc.

The illustration shows the simplicity of the **Champion Priming Plug.** It is guaranteed to work perfectly **or your money back.**

FOR SALE EVERYWHERE AT $1.25 PER PLUG

Trial Set of Four Champion Priming Plugs, fully guaranteed, prepaid to any car owner for $5. Give name of car and year of make—also name of your dealer.

All jobbers and most dealers are already supplied. Write today. Liberal trade discount to dealers. Be ready to supply your trade while our big campaign is calling the attention of car owners everywhere to these priming plugs.

Champion Spark Plug Company

106 Upton Ave. Toledo, Ohio

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Prevents Unauthorized Use of Car

Jones Speedometer-Recorder

The Great Step Forward in Speedometer Construction

What It Does

Records every movement of car, and gives a record of momentary speed. In other words, it is a speedometer of highest quality and puts the record in black on white. Shows when car left garage. How fast it traveled. When it stopped. How long and how often. It shows the distance traveled in total and between each stop, and the time consumed. And it shows when the car returned to the garage.



What It Is

The JONES SPEEDOMETER-RECORDER is attached to the dash. It is driven by shaft and gears identical with a speedometer. The handsome JONES SPEEDOMETER surmounts the RECORDER, sufficiently ornamental to grace any dash. The RECORDER has an open glass front and chart is always visible—it is fascinating to watch the development of the record as the minutes pass.

Why It Is Absolutely Necessary

Joy riding is an unnecessary evil of motoring—it can be stopped with the JONES SPEEDOMETER-RECORDER. No joy-rider will dare remove a car if he knows that the record of such movement will be shown and indicated to the owner.

Computes Cost of Car Maintenance

It is a necessity to the man who wants to know how much tires, oil and gasoline cost. It is the only accurate method of computing cost of car maintenance. This instrument adds a new element of interest to motoring.

Write for Complete Information.

THE JONES SPEEDOMETER,

MAIN OFFICE:
Bush Terminal, New York

New York: Broadway and 76th St.
Chicago: 1430 Michigan Ave.
Boston: 109 Massachusetts Ave.

Philadelphia: 1427 Vine St.
San Francisco: 530 Golden Gate Ave.
Buffalo: 20 Goodrich St.
Los Angeles: 1227 S. Olive St.

Portland: 329 Ankeny St.
Seattle: 917 East Pike St.
Detroit: 872 Woodward Ave.

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You can't afford to overlook the

HAYNES

in selecting your line for 1913

This new

Model 24, $1785



Left Side Drive—Center Control
Electric Starting and Electric Lighting

puts every Haynes dealer on the offensive and beyond competition, even in these strenuous days in the automobile business.

That's why it's more than ever to your interest to consider the Haynes NOW

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Consider first what a magnificent car this is, backed by Haynes merit, satisfaction, tradition and service



Front View Model 24

THIS NEW MODEL is worthy of the name Haynes—if it were not, we would not offer it. The new low price doesn't mean that Haynes standards have been cut.

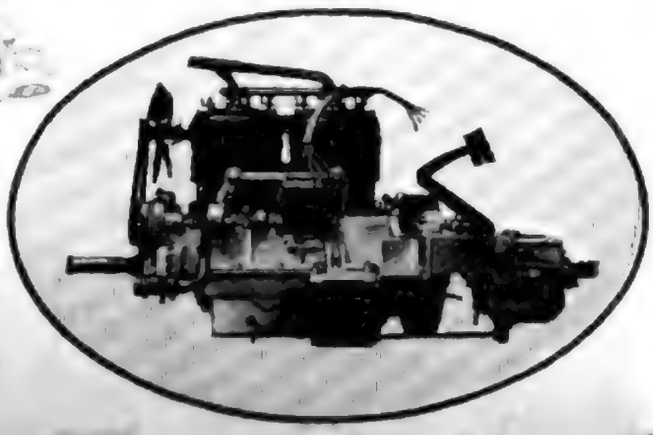
There are some noteworthy departures from former Haynes construction in Model 24—all designed for greater efficiency. Model 24 has left side drive—in step with the designs of the latest models in nearly all high grade cars—and a center control, which is especially convenient.

The new car has the same electric starting and electric lighting system we adopted for Model 22 six months ago—the type of electric starting and lighting equipment which has since become the standard for first class cars.

Furthermore, it has the famous Haynes contracting steel band clutch — Haynes transmission, spring suspension, lubrication system and a sturdy, flexible power-unit support.

Model 24 is a big car—118 inch wheel base—it has wide, roomy seats with upholstery 12 inches deep, covered with finest hand-buffed leather.

Left Side View—Haynes Motor Model 24



This Haynes for $1785 means a broader field for every Haynes dealer. It places a Haynes car in reach of thousands of buyers who have long wanted a car at this price, backed by such standards of merit and service as have kept the Haynes — America's first car — always its foremost.

Haynes Model 24 is a new Standard in the $1800 class. It means big sales for Haynes dealers

A HAYNES CAR at $1,785 is made possible only by the efficiency of the Haynes plant, by its use of only the latest and most approved methods of automobile construction—it is the culmination of twenty years' experience in automobile building.

The standards which have made the Haynes pacemaker most of the time—and have kept it up with the leaders all the time—are new standards in a car selling for less than $1800. There's no room for argument on this point.

The buying public knows what Haynes standards mean—it knows that Haynes reputation was not built on catch-phrases in advertising. The best advertising the Haynes has had, and is having, is the unqualified satisfaction of Haynes owners everywhere. This satisfaction of Haynes owners is the greatest assurance Haynes dealers have of a successful future.

Specifications

Read carefully what the Haynes Model 24 offers. Bear in mind that Haynes character stands behind these specifications. And ask yourself what demand there is today for such a car at such a price.

Frame—Pressed steel 4" deep, double drop.

Wheel Base—118 inches.

Motor—4½ inches bore by 5½ inches stroke. L-head cylinders cast in pairs, offset ½ inch. Flexible 4-point suspension.

Ignition—Dual type magneto.

Carburetion—Stromberg Model B Special.

Lubrication—Splash and force feed, oil reservoir in lower half of crank case and filled through feather pipe on side of crank case.

Control—Steering wheel on left side—Center control.

Steering Column—Worm gear type, corrugated rim, aluminum spider, 18-inch wheel.

Clutch—Haynes contracting steel band on hardened steel drum. Supported by crank shaft. Easily adjusted and lubricated.

Transmission—Selective type, three speeds forward, one reverse. Roller bearings. Operated through H-slotted bracket, center control. Supported from two rear arms on engine base.

Propeller Shaft—Forged. Two universal joints, metal enclosed and packed with hard grease.

Rear Axle—Full floating type, pressed steel housing, supporting full weight of car. Shaft, nickel steel.

Front Axle—Single piece I-beam, drop-forged. Spring seats forged integral. Roller bearings.

Wheels—Artillery type, wood, twelve spokes front and rear. Bossed spokes alternating in rear wheels. Demountable rims.

Tires—34x4, front and rear.

Springs—Front, semi-elliptic, 40 inches long, 2 inches wide, 7 leaves; rear, three-quarter elliptic, 48 inches long, 2 inches wide, 7 leaves. Fitted with grease cups both front and rear.

Brakes—Internal and external on rear wheels. Drum 14x2½-inch face. Disappearing foot pedal operates external service brakes, and lever on right of driver's seat operates internal emergency brakes.

Body—Sheet metal, fore door. Black, hand buffed upholstery, spring backs to both seats filled with super extra curled hair.

Colors—Body black. Wheels black, same as body. Special colors to order. All metal equipment black enamel and nickel.

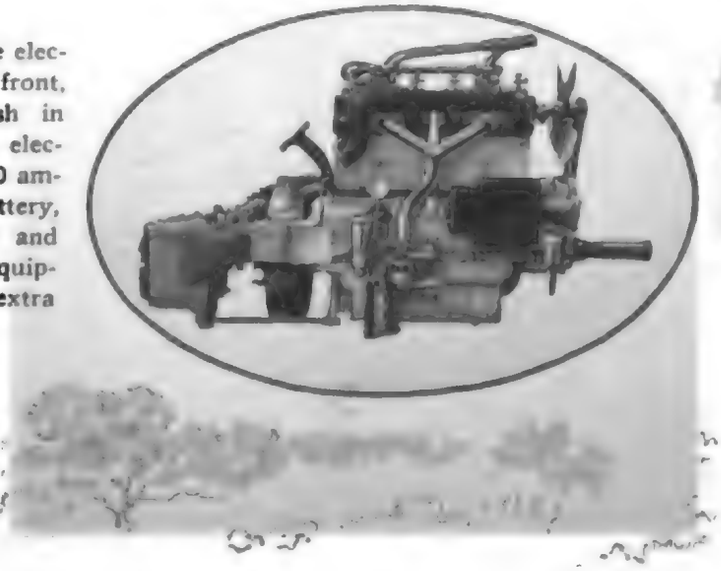
Gasoline Tank—18 gallons capacity

Road Clearance—10 inches.

Equipment

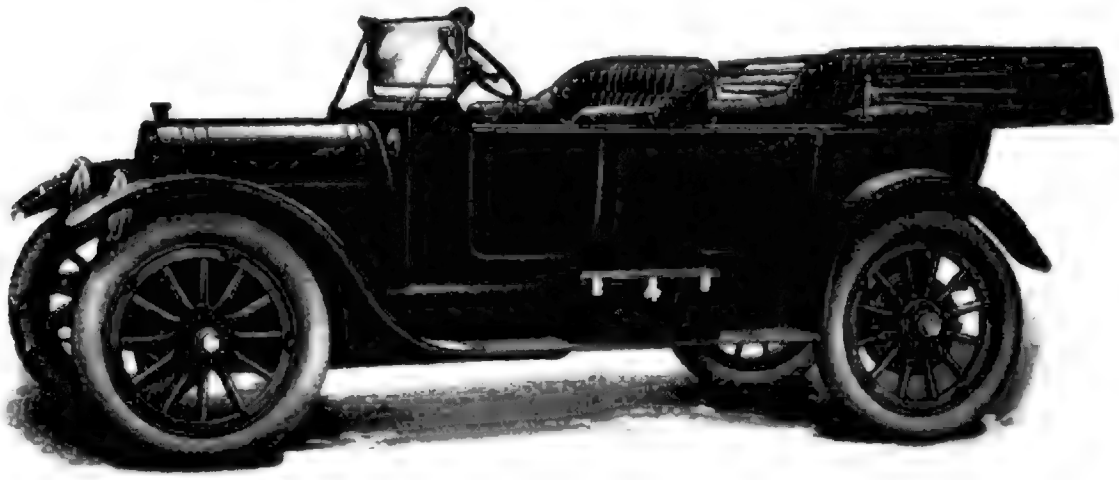
Top, top cover, two large electric head lights, glass front, electric side lights, flush in dash, electric cowl lamp, electric starter, generator, 100 ampere hour storage battery, speedometer, horn, coat and foot rails, tire irons, full equipment tools, etc., also one extra demountable rim.

Right Side View—Haynes Motor Model 24



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The Big Haynes, Model 22—The Complete Car—which has met with success everywhere, is continued as a Haynes Leader



The big Model 22, full 40-horse power, marks the highest development of the Haynes Car. It is in every way The Complete Car—durable and dependable, comfortable and handsome, powerful and quiet—everything a car should be. It is the very maximum of automobile efficiency at the very minimum of cost.

Model 22, Detail Specifications

Motor, 4½ in. x 5½ in., 40 h. p.; wheel base 120 in.; fine hair upholstery, 12 in. deep; tires 36x4½ in.; absolutely 100% efficient electric starting equipment of utmost simplicity; Eisemann dual magneto, Stromberg carburetor, Warner autometer, demountable rims, top, windshield, electric signal horn, electric cowl lamp, standard bumper, etc., etc. Touring car models $2250; Roadster $2250; Coupe $2750; Limousine $3400; Berlin $3500; f. o. b. factory.

See these Haynes Cars at the Shows

Space 114, Madison Square Garden, New York

Space C-5, Coliseum, Chicago

But, if your territory is still open for a Haynes Agency, don't wait until the shows. Write or wire us today. There is no better proposition for 1913.

Haynes Automobile Company

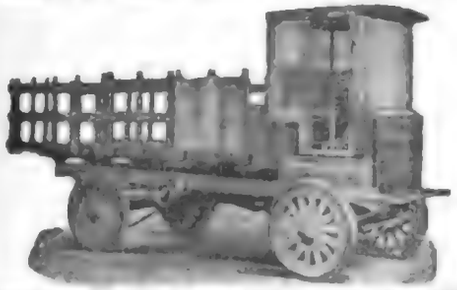
499 Union Street **Kokomo, Indiana**

Lauth-Juergens

Lauth-Juergens Trucks are Delivery Insurance

QUALITY DURABILITY

ONE, TWO AND THREE TON CAPACITY



LAUTH-JUERGENS TRUCKS ARE THE LATEST IN CONSTRUCtion, most powerful in operation and the motors are guaranteed against defective workmanship and material for the life of the truck. They are positively the highest class trucks made. Use cylinder construction first cylinder, one, two and three-ton. Four speeds forward. Heat Bright ball bearing transmission made in our own shops of the finest nickel steel, three piece disc clutch, covered by patents owned by us. Some for 1912 Catalog and specifications. Prompt delivery on all models. Large publicity campaign just begun. Our quality will do the rest.

Reliable Agents: Secure Your Territory for 1912 at Once

The Lauth-Juergens Motor Car Co., Fremont, Ohio.

Branches and Agencies

BOSTON—David Abrams, 131 Portland St.
NEW YORK—West Side Garage & Motor Co., 160-162 101st St.
CHICAGO—The Lauth-Juergens Motor Car Co., 2630-32 Wabash Ave.
NEWARK, N. J.—Merchants Motor Car Co., Essex Building.
DETROIT, MICH.—Bierl Auto Truck Sales Agency, 453 Dix Ave.
DISTRICT OF COLUMBIA AND VICINITY—Bowles Motor Sales Co. Inc., 1606 14th St. N. W. Washington, D. C.

BOSCH

MAGNETO and PLUGS

JUST how reliable your motor car may be depends entirely on your ignition system. In efficiency and dependability as well as actual number in use the Bosch magneto reigns supreme and the Bosch plugs are as good as the magneto.

Be Satisfied Specify Bosch

Write for Literature

BOSCH MAGNETO COMPANY

223-225 West 46th Street NEW YORK

Detroit Chicago San Francisco Toronto

Dependable Deliveries



DELIVERY dates are of utmost importance. Delay in shipments means loss of money.

We guarantee prompt deliveries.

Warner Quality and Warner eight-year old reputation for making highest class gears is back of the product.

Car makers interested in the Quality and Merit that means absolute safety and satisfaction will do well to write.

We modify our designs to meet detail requirements, or build to approved designs on season quantity specifications.

Philadelphia, Glenwood Av. and 2nd St.
Detroit, 628 Ford Building

Warner Gear Co.
Muncie - Indiana

AJAX TIRES

Guaranteed 5000 Miles

Guaranteed 5000 Miles

Money-Saving Tires

If you are seeking relief from tire expense—the one big expense automobilists are compelled to suffer—why not try Ajax Tires? You must have heard much about them—about our WRITTEN GUARANTEE FOR 5,000 MILES which accompanies every tire.

When you first use Ajax Tires you are astonished. You never knew so much service could be obtained from tires.

To increased tire mileage and fewer tire troubles is due the amazing success of Ajax.

DEALERS—Owing to their widespread popularity there is a splendidly profitable business for dealers in handling Ajax Tires. Communicate with us NOW.

AJAX-GRIEB RUBBER CO.

General Offices: 1796 Broadway, New York City

Factories: Trenton, N. J. **Branches in Principal Cities**

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New Departure Ball Bearings

SIGNIFY

Guaranteed Materials
Guaranteed Accuracy of Dimension
Guaranteed Uniformity

No ball bearing is so carefully made, closely gauged, persistently inspected and insistently standardized.

Catalog, data sheets, consultation service of our Engineering Department are yours for the asking.

Guaranteed Quality
Guaranteed Service and Capacity
Guaranteed Durability

American Made for American Trade

The New Departure Manufacturing Co.
BRISTOL, CONN.
Western Branch, 1016-17 Ford Building, Detroit

American Made for American Trade

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Cut Gears of Quality
Complete Differentials

The New Process Gear Corporation
SYRACUSE, N. Y.

The New Process Gear Corporation

Stewart Delivery Trucks

Money-Savers
Time-Savers
Trade-Bringers

Sell Stewart Trucks in Winter Months

No let-up in business for the dealer who handles Stewart Delivery Trucks. Cold weather only increases the need for motor delivery. Merchants are already worrying over their holiday deliveries. They know that their horse equipment will be inadequate during the cold, snowy days and the rush and long hours of the Xmas trade and special sales.

We can guarantee prompt deliveries of Stewart Delivery Trucks in time for the winter business. We can furnish dealers their demonstrators almost immediately. Now is the time to go out and get this desirable business. Merchants are looking for the right car; one that is scientifically designed for hard delivery service. You can get their orders for Stewart Trucks now. Write for our literature and liberal proposition to dealers.

Stewart Motor Corporation, Buffalo, N.Y.

T. R. Lippard, Pres. and Gen'l Mgr. — R. P. Lentz, Sec. and Treas.
R. G. Stewart, Vice-Pres. and Chief Eng. — R. W. Ingersoll, Sales Mgr.

Mr. Dealer: The Borland is *the* Electric to satisfy the owner and profit the agent. Secure your territory *now* for 1913.

Our complete line of models will be demonstrated at the Chicago Show—Space A-1, First Regiment Armory

THE BORLAND-GRANNIS COMPANY
Salesrooms: 2638 Michigan Ave., Chicago
Factory: E. Huron Street



DIAMOND CHAINS

are and have been the recognized quality standard for 20 years. Strong, accurate and durable. Let us cut your sprockets.

DIAMOND CHAIN & MFG. CO.
150 W. Georgia St. Indianapolis, Ind.
Capacity 8,000,000 feet per year.

Mighty Michigan "40"

40-Horsepower Touring Car or Roadster, absolutely silent in operation. Oversize tires 35 x 4½—cylinders 4¼ x 5¼ in.—118-in. wheelbase—four-forward-speed transmission—demountable rims—nickel mountings—massive, straight-line body—big, roomy seats—electric lighting by generator—everything. Price $1585, includes full equipment. Two smaller models. Catalog on request.



MICHIGAN MOTOR CAR COMPANY
(130) Kalamazoo, Mich.

PULLMAN 1913

Three New Models—All Fully Equipped

4-36	4-44	6-66
$1,875	$2,150	$2,750

We are building 500 extra PULLMANS for 1913—1500 in all. Our present dealers have spoken for 1000 and the increase is for new territory—possibly yours is open. Our SALES MAKING ORGANIZATION helps the agent—let us tell you how.

PULLMAN MOTOR CAR CO., York, Pa.

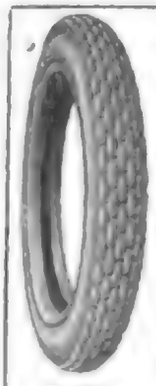
The Chicago Electric

A beautiful and classic equipage that stands unchallenged in point of constructional achievement.

CHICAGO ELECTRIC MOTOR CAR CO.
3606 South Morgan Street, Chicago

REPUBLIC

STAGGARD TREAD TIRES and BLACK-LINE RED INNER TUBES



Motorists who use Republic Staggard Tread Tires will tell you that they—Prevent skidding, make quick starts and short stops easy. Give double mileage because of the full thickness tread under the studs.

Most Widely Imitated of All

We guarantee the Republic Black-Line Red Inner Tube to be as nearly perfect as a tube can be made—and is a fitting companion for the splendid Republic Staggard Tread

The Best Tube Made



Republic Staggard Tread

The Republic Rubber Co.
Youngstown, Ohio

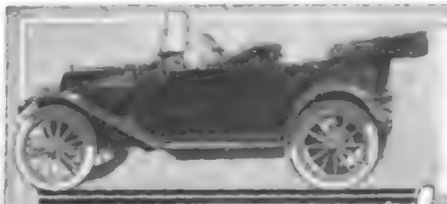


THE RUTENBER MOTOR

Is responsible for the success of a large majority of the most prominent pleasure and commercial cars. They will bear your investigation before the purchase of any type of car. Literature upon request.

Large photogravure of the above cut for framing (4c in stamps)

RUTENBER MOTOR CO., Marion, Ind.



"Olympic" $1500 4 Cylinders
"Majestic" $1975 4 Cylinders
"Sultanic" $2650 6 Cylinders

JACKSON AUTOMOBILE CO.
1201 EAST MAIN STREET
JACKSON, MICHIGAN.

Jackson

NO HILL TOO STEEP
NO SAND TOO DEEP

KISSELKAR

Every part built in the KisselKar plant, which is equipped with every facility for economical manufacture. All KisselKars have extra liberal wheelbase and roomy tonneaus unsurpassed by any car at any price for comfort and capabilities. Write for catalog.

KISSEL MOTOR CAR COMPANY
150 Kissel Avenue Hartford, Wis.



"Thirty" "Forty" "Fifty" 60 H.P. "Six"

KisselKar prices include full equipment—self-starter, top, windshield, demountable rims, speedometer, electric lighting equipment, shock absorbers, etc.



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TRIPLEX

A FUEL SAVER and A MONEY SAVER

Increases Power
Decreases Cost

The Triplex is a device placed between the manifold and the carburetor to break up the mixture. No matter how imperfectly the carburetor does its work, the Triplex equalizes the mixture, producing an explosive gas of even, uniform quality that will burn clean to the last atom. This means that the user gets all the power all the time—that every fraction of energy to be obtained from the gasoline is produced and used. There is absolutely no waste. High proof gasoline is made out of low, and over 25% is saved on every gallon. For further information write us

BREMER-WILSON MFG. CO., 1256 Michigan Ave., Chicago, Ill.

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RAJAH GIANT PLUG

Extra strong and heavy. Perfectly simple—only four parts, which are easily taken apart for repairs or replacement. Only highest grade, imported, hard fire porcelains used. Minutely accurate, well finished machine work. No thumb screws—a Rajah Clip Terminal supplied with every Plug. Price, $1.50 postpaid—the most economical Plug made. Send for catalog.

RAJAH AUTO SUPPLY CO., Bloomfield, N.J.

THE LONG HORN

The One Mechanical, Never Failing Warning Device

Costs Little to Buy—
Costs Nothing to Operate

No Battery—No Wire—No Bulb—No Motor to break down or fail to work.

THE G. PIEL COMPANY 13th Street and Boulevard LONG ISLAND CITY

Philadelphia, 1416 Vine St.; Boston, 109 Massachusetts Ave.; Minneapolis, 70 So. 10th St.; Buffalo, 852 Main St.; Chicago, 1322 Michigan Ave.; San Francisco, 544 Van Ness Ave.; Los Angeles, 1229 S. Olive St.; Seattle, 917 E. Pike St.; Portland (Ore.), 329 Ankeny St.; Denver, 15th and Curtis Sts.

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ALL SIZES **ANY PITCH**

HYDRAULIC PRESSED STEEL CO.
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EISEMANN

Has Always Led

Ask us to tell you about the wonderful new pole pieces and the Automatic Control Magneto.

THE EISEMANN MAGNETO COMPANY

Indianapolis, Ind.	New York	Detroit, Mich.
514 N. Capitol Ave.	General and Sales Office 225-227 West 57th St.	802 Woodward Ave.

70% Reduction in Tire Bills

WIRE McCUE WHEELS

Save Tires—Save Fuel—Save Car. Make cars easier riding and easier driving. Stronger than any other practical wheel.

THE McCUE CO., Buffalo, N. Y.



Ready for 1913

"STANDARD" WHEELS

FOR PLEASURE OR COMMERCIAL CARS
One Passenger to 16 Tons Capacity

Send for Catalog No. 15

STANDARD WHEEL COMPANY, Terre Haute, Ind.

SPLITDORF

"Always There"

SPLITDORF MAGNETOS can always be depended upon to give your motor more power. They give the same efficient service winter and summer and never falter under any test.

Write for new catalog

SPLITDORF ELECTRICAL CO.
98 Warren Street, Newark, N. J.

How to Repair an Inner Tube in 15 Minutes

Directions: Place tube between plates of the Imperial Vulcanizer (see cut); tighten thumbscrews; put a little gasoline in pronged receptacle; ignite. A permanent repair in 15 minutes.



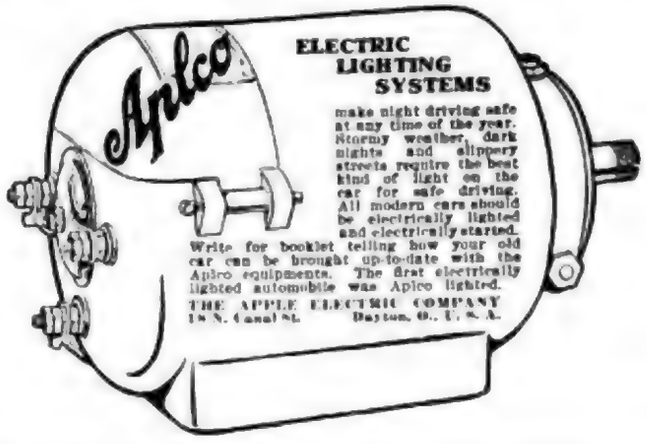
You can do this yourself at home or on the road—anywhere. The Imperial Vulcanizer saves time, saves money, is easy to operate, and pays for itself in a short time.

PRICE, $3.50 NICKEL PLATED Patent Pending

Complete with enough rubber for 40 punctures. At your dealer's or sent by express.

Guaranteed to Satisfy or Money Refunded

McGRAW TIRE & RUBBER CO., Dept. E, East Palestine, Ohio



Drop Hammer Forgings

cost very little more than castings. They are vastly superior and less expensive in the end.

WE ARE SPECIALISTS

in producing

DROP HAMMER FORGINGS

from special analysis steel.

Send prints of parts you will need in

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QUALITY AND SERVICE GUARANTEED

THE CONSOLIDATED MANUFACTURING COMPANY, Toledo, Ohio

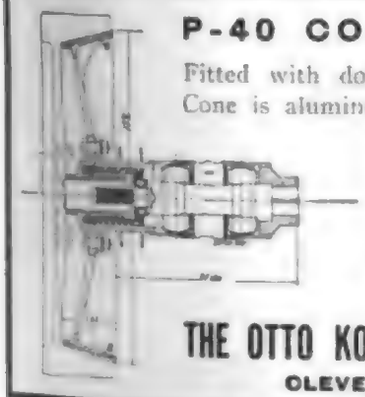
The Reasons for Jencick Quality and Jencick Prices are worth knowing.

JENCICK MOTORS For Motor Trucks

from base to spark plug, have features that are "Different and Better."

JENCICK MOTOR CORPORATION

Port Chester, New York



P-40 CONE CLUTCH

Fitted with double universal joints. Cone is aluminum and has face machined after leather is riveted on, giving absolute fit in flywheel. Easy engagement and long life guaranteed.

THE OTTO KONIGSLOW MFG. CO.

CLEVELAND, OHIO

THE ONE MAN TOP



We Exhibit in Madison Square Garden.

Stand No. 539 Basement, January 11th to 18th.

CAN BE HANDLED BY ONE PERSON AS EASILY & QUICKLY AS AN UMBRELLA

INSTANTANEOUS PROTECTION

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Some automobile owners are always cleaning their spark plugs —others who use Reliance Plugs don't have to.

The Reliance book, "Ignition and Spark Plug Talk," tells why. Supposing you write today and get a copy.

JEFFERY DEWITT CO.

65 Butler Avenue Detroit, Mich.

Largest Exclusive Spark Plug Manufacturers in the World

In the year 1913

More Remy Magnetos

will be used on American Cars THAN ALL OTHERS COMBINED. We are the world's largest manufacturers of Magnetos, Electric Lighting and Starting Equipment for Motor Vehicles.

Standardize Your Car — Specify Remy

REMY ELECTRIC COMPANY

Factory — Anderson, Indiana — General Offices

Branches and Service Stations in Automobile Centers.

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Detachable Wire Wheels
fitted with
Houk (Quick Detachable) Rims
Guaranteed the Best in the World

Geo. W. Houk Company
5003 Lancaster Ave., Philadelphia, Pa.

THE GRINNELL
Gas Controller and Igniter
Price Complete $24

Lights, dims and extinguishes all gas lamps on the car through a simple turn of the hand. Coupled to valve-stem of acetylene tank. Direct control. Always within easy reach



Convenient
Safe
Dependable

Write for booklet and dealer discounts.

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Sole Licensed Manufacturers for the United States.

They Help to Sell the Car
The service a car gives depends on the perfection of little parts. We devote the energy of a large organization to perfecting—

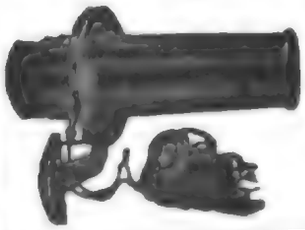
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With heads that will not pit or warp and stems that will not crystallize or break.

YOKE BOLTS
With bodies drawn from open hearth or nickel steel electrically welded to heads drawn from the same material.

SHACKLE BOLTS
Accurate in size, scientifically hardened and fitted with integral grease cups insuring perfect lubrication.

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Cleveland, Ohio

NEWTONE
Motor Horns
Prices are the lowest for which horns of Dependable qualifications can be bought



Torpedo Type
Price $20

Automobile Supply Mfg. Co.
220 Taaffe Place, BROOKLYN, N.Y.



"Firestone"
Tires and Rims
are the least likely to require changing, and afford the best means of tire changing when required.



The Firestone Tire & Rubber Co., Akron, Ohio
and All Principal Cities

30% More Mileage



Save The Tires
Every automobile owner and every dealer has been interested in watching our National advertising of Tirenew. The big demand it has created means profit to the dealer.

Narco Product — **TIRENEW** — Narco Product

Prevents Tire Decay

is a liquid, unvulcanized rubber compound made with a base of pure gum—waterproofs and protects from oil, moisture, sun and steam—*Makes Tires Look Like New.* There are imitations which paint but don't protect—insist on Tirenew. Send $1.60 for a can—enough to Tirenew 8 tires. Ask about our other products

Narco Rubber Reviver	Non-Inflammable Rubber Cement	**Leakanot**, a liquid rubber, waterproofing dressing for anything leather.

NATIONAL RUBBER COMPANY, 4413 Papin St., St. Louis, Mo.

Diamond
SAFETY TREAD (Squeegee) TIRES
Won't Slip-Won't Slide
Won't Skid-*They Grip!*



THE DIAMOND RUBBER CO. OF N.Y.
Subsidiary of The B. F. Goodrich Co.
AKRON, OHIO

INTERLOCK INNER TIRES
Stop Tire Troubles
The one weak point of the automobile is that you cannot depend on the tires. Thousands of motorists have solved their tire problem by discarding inner shoes, rubbers, fliers and other makeshifts and equipping their tires with **Interlock Inner Tires.**

Interlocks are complete inner tires (not inner shoes) placed between the outer casing and inner tube to strengthen the casing and protect the tube from punctures. They double the mileage of new tires and add 5,000 to 7,000 miles to old ones—save half your tire expense—and make tires trouble proof.

Dealers and Motorists—Investigate Interlocks

Don't delay—write now for booklets, data, prices, testimonials of users, road tests, etc. Mention size and kind of tires you use.

DOUBLE FABRIC TIRE CO. 600 W. 9th Street, Auburn, Indiana

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"The Car With A Conscience"

Write for 1913 Catalog

FOUR AND SIX CYLINDER MODELS

$1000 to $3000

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250 Oakland Boulevard PONTIAC, MICH.

MARMON

"The Easiest Riding Car In The World"

The Marmon "32"

32-40 h. p., 120-inch wheelbase, dependable electric starting and lighting system, left-hand drive, center control, nickel trimmings, with newest body types to meet every requirement and corresponding equipment—

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48-80 h. p., 145-inch wheelbase, dependable electric starting and lighting system, left-hand drive, center control, nickel trimmings, with body body types to meet every requirement and corresponding equipment—

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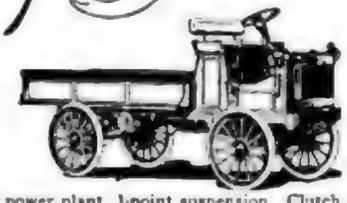
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The Truck Built by Truck Specialists



A high grade, dependable one-ton truck, accessible, simplified, and built to give service that is bound to satisfy the user.

Four-cylinder, water-cooled unit power plant, 3-point suspension. Clutch and flywheel in oil-tight housing. Lastingly good, therefore permanently popular.

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Hupmobile "32" Touring Car, Fully Equipped, $975 F.O.B. Detroit

Long-stroke motor, 3¼ x 5½ inches. Enclosed valves. Three bearing crank shaft. Unit power plant. Multiple Disc clutch. Three speeds forward. Sliding gears. Full floating axle. Center control. Zenith carburetor. Bosch magneto. 106-inch wheelbase. 32 x 3½ inch tires. Quick detachable rims. Mohair top with envelope. Jiffy curtains. Windshield. Rear shock absorber. Prest-O-Lite tank. Gas headlights. Oil side and tail lamps. Tools—horn. Trimmings, black and enamel. Standard color, black. Magneto and camshaft driven by silent Coventry chain.

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Chassis and specifications same as Touring Car. Large turtle back dust proof compartment for extra accessories, tires and baggage.

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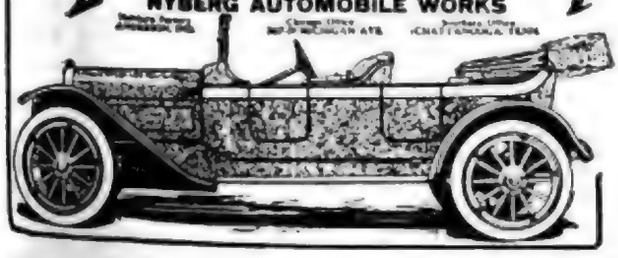
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Complete Specifications Sent on Request

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Direct Drive—Single Reduction
Foot Control
Irreversible Worm Steer
Long Mileage Batteries
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DEALERS—Here is the first electric truck that sells for about $700 less than any other. Capacity 1000 pounds—Service 100 per cent. more than gasoline truck—Economy of production most pronounced. Write.

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THE AMERICAN BALL-BEARING COMPANY
Cleveland, Ohio

Standard Universal Rims

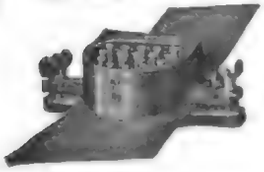


fit any style or make of tires. The side rings are reversible, they curve outward on one side to fit a straight side tire, inward on the other to accommodate a clincher. Two turns of a nut unlocks the rim for demounting, two more turns locks the rim in place. Write for catalog 607, which explains fully.



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Repairing Casing



TIRE CUTS ruin casings. They admit moisture to the carcass, cause the fabric to rot and weaken, grow larger—end in blowouts.

You can repair **CASINGS** and **INNER TUBES** anywhere in 15 minutes, better than a Repair Shop can do—and for *one cent*.

Universal Auto-Vulcanizer
Patented

A practical vulcanizing outfit complete, with enough repair gum to make 40 patches. It weighs 3 pounds and can be carried in the tool box. **Simplest and most satisfactory device for eliminating tire troubles that has ever been devised.**

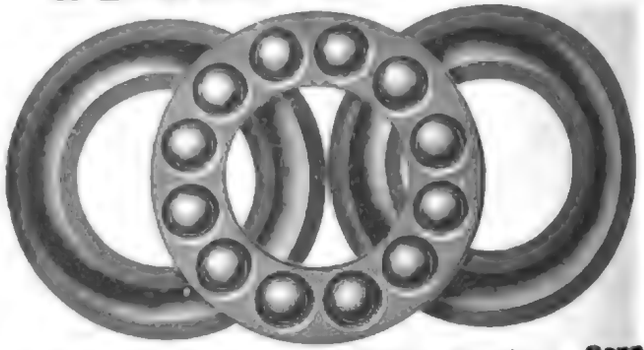
Absolutely automatic. Place the patch—attach the Vulcanizer—put in the gasoline light it. No further attention required. In 15 minutes the job is done.

It *can't burn, scorch or injure* tube or casing. It *can't* get out of order. It *can't* fail to do its work. So simple, anyone can operate it. The Universal Auto-Vulcanizer saves its cost a *hundred times* over in trouble and expense.

Price Complete **$4.00** Ready for Instant Use
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Gives Standard Carburetion

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Do you wish to make your car more comfortable by installing a pair of auxiliary seats? If so, have the best. Our seats are made in five styles. Send for catalogue.

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"Tire Insurance for $1.00"

The best, simplest, most accurate, most durable and most easily read tire gauge on the market.

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(KNIGHT TYPE MOTOR)

The first American Car to adopt the Silent Knight Motor—the engine used by Daimler, Mercedes, Panhard and Minerva.

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See New Mercer Series at New York Show—Space 112, Madison Square Garden.

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Prices: $2600 to $2900

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Write For This Franklin Dealer Proposition



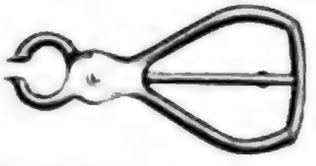
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For adding, subtracting, multiplying, and dividing, and tabulating wide sheets up to 12½ inches—for *any* kind of figure work within the capacity of a seven-column adding-listing machine.

The illustration shows the big features—*all* the printing always visible in *easy reading range*, adding dials directly *under* the eye, low keyboard, and the speediest, most efficient typewriter carriage ever put on an adding machine.

This machine is a *Burroughs* from the designing room to the user's office, built in the Burroughs factory, of the same material, with the same wonderful machine tools and by the same trained workmen who have built a reputation for lifetime service into other Burroughs models.

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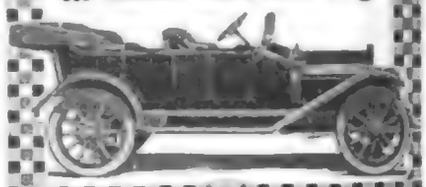
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A tire filler 10 to 20 per cent. lighter than any other tire filler. A big proposition for dealers who are on the alert for more and better business. Write for details.
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OF EVERY DESCRIPTION
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GARAGE MODEL repairs three tubes and two casings at a time. Cheapest and best on the market. Get our special selling plan. Portable model for individual owners which will please your customers. List price, $12. Manufactured by
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Automobile Tires
We talk a good deal about the mileage of Kelly-Springfield Tires. We talk it because they give it—an average mileage a thousand or two greater than the average mileage of the average tire. They give it because we build it into them.
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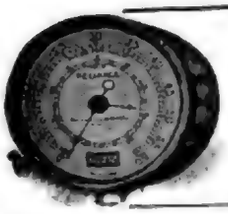
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Special features that eliminate speedometer troubles. Send for the booklet.

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forces the water from radiator through cylinder water jacket, maintaining rapid circulation when car is in motion. Write for descriptive matter if you handle Ford cars.

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Smooth as Electric, Will replace any engine in any car

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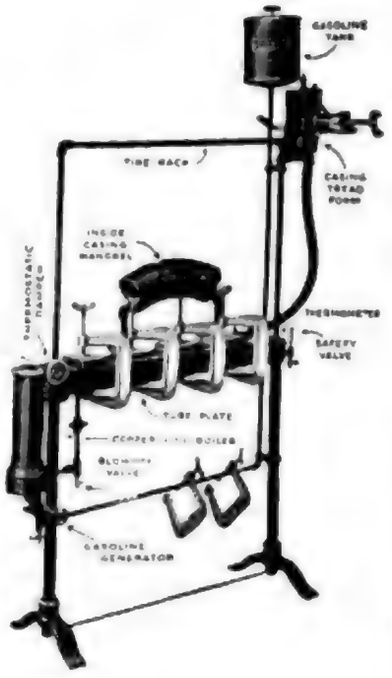
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Complete Steam Vulcanizing Plant—$45

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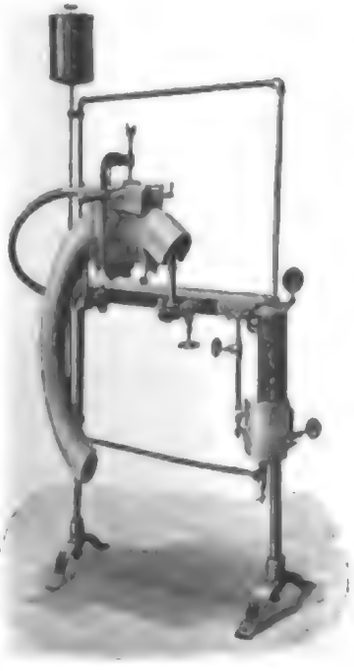
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Will do every kind of vulcanizing that you want to handle, tube punctures—or large casing blow-outs. Steam is raised in twenty minutes in a copper coil boiler, so the machine can be profitably heated even if only a single tube repair is to be made. Gasoline or gas used for fuel. A gallon of gasoline will run the whole outfit all day long.

It's a SHALER Vulcanizer



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— In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

ONE OF THE LARGEST AND BEST RENOWNED FIRMS OF THE NORTHERN CAUCASUS (ESTABLISHED 1836—FIRST CLASS REFERENCES) WISHES TO ESTABLISH BUSINESS CONNECTIONS WITH FIRST CLASS AMERICAN AUTOMOBILE MANUFACTURERS FOR DELIVERY OF ONLY WELL TESTED AND HIGHLY APPROVED AUTOMOBILES SUITABLE FOR BAD RUSSIAN ROADS AND MOUNTAINOUS COUNTRY. PLEASE ADDRESS DETAILED OFFERS, IF POSSIBLE IN GERMAN OR FRENCH, TO THE FIRM "A. T. RUDNEW," STAVROPOL (CAUCASE), RUSSIA.

BROKEN Cylinders and Crankcases—Send them to be made good as new at fraction of replacement cost. Scored cylinder repaired, $12. No new piston and rings required because bore is not enlarged. Where cylinders are worn (not scored from loose wrist pin) reboring is only remedy. We do it expertly. Write for complete information and estimates. WATERBURY WELDING COMPANY, Waterbury, Conn.

MANUFACTURING PLANT FOR SALE THE LARGE FACTORY OF THE CORTLAND WAGON CO., LOCATED AT CORTLAND, N. Y., CAN BE BOUGHT ON EASY TERMS FOR ONE-THIRD ITS ACTUAL VALUE. THE PLANT COMPRISES EIGHT ACRES OF GROUND IN THE CENTRAL PART OF THE CITY, AND LACKAWANNA AND LEHIGH TRACKS RUN ALONGSIDE EVERY BUILDING. THE BUILDINGS ARE OF BRICK AND CONTAIN ABOUT FOUR ACRES OF FLOOR SPACE AND ARE ALL EQUIPPED WITH SPRINKLER SYSTEM, ELECTRIC LIGHT, STEAM HEAT, ETC. THE WHOLE PLANT IS IN FIRST CLASS CONDITION WITH STEAM IN THE BOILERS AND IS READY FOR IMMEDIATE OPERATION. IT IS ESPECIALLY ADAPTED TO THE MANUFACTURE OF AUTOMOBILES AND ACCESSORIES AND AN ABUNDANCE OF SKILLED LABOR CAN BE OBTAINED IN THE VICINITY. IF INTERESTED, PLEASE COMMUNICATE WITH D. W. VAN HOESEN, CORTLAND, N. Y.

WANTED—A high class draughtsman, having had motorcycle experience. In making application state previous experience and salary expected. THE POPE MFG. CO., Westfield, Mass.

AUTOMOBILES FOR SALE—Lozier touring cars; bargain; engines overhauled this fall. Address F. W. LOOMIS, 447 Milwaukee St., Milwaukee, Wis.

KEROSENE FOR AUTOMOBILES.
New Model B uses successfully half and half mixture lowest grades kerosene and gasolene. Satisfaction guaranteed or money refunded. Greatly increased power, very slow speed on high. Starts easy at zero. Special agents' prices. Dept. 8. THE AIR-FRICTION CARBURETOR CO., Dayton, Ohio.

WANTED—A promoter that has the ability to sell State Rights for the best Tire Filler on the market, to a strictly high grade man, that can get results, money is no object. RUSH. NATIONAL TIRE FILLER CO., Grand Rapids, Mich.

FORD spare demountable wheel, something new. No tire trouble on road. Write. ANGIER'S, Streator, Ill.

FOR pretty automobile garages write to J. A. CATHERMAN, Beaver Springs, Pa.

1913 PACKARD—Will dispose of my new 1913 6-cylinder, 7-passenger touring car at a bargain if taken immediately. Address H. M. WALLIS, JR., Racine, Wis.

SURPLUS STOCK BOUGHT
Cars, Bodies, Tops, Tires, etc.
Cash transactions. Quick business.
20TH CENTURY CO., 1700 B'way, N. Y. C.

FOR SALE—1908 Winton touring car, 7-passenger, good running order, fully equipped; price $400. Address BOX 230, Motor World.

FOR SALE OR EXCHANGE—Several good used motorcycles. WOLKE CYCLE COMPANY, Louisville, Ky.

THREE-Ton Gramm and four-ton Knox Trucks, $2,250 and $2,750; will trade for Coast real estate. CLARKE, 529 Hamilton Bldg., Portland, Oregon.

BARGAIN—Two new and never used 34 x 4 Davis Armor, Model B, Tire Protectors; cost $54.00. Will take $32.00. Disposed of car before "Armors" arrived. BOX 231, care Motor World.

PEERLESS LEATHER TOP DRESSING
An oil preparation that softens the leather and pantasote. Makes old tops look like new. Ask your garage and supply dealer for it.
The Columbus Varnish Co., Columbus, O.

FOR SALE—1910 Peerless limousine; newly done up and relined; price $2,000. 1730 Land Title Bldg., Philadelphia, Pa.

VICTORIA TOPS AND SEAT COVERS
That's our specialty, but we make a full line as well. Any style and every one the best that high-grade materials and experienced workmen can make. Prompt service assured. We're glad to estimate special work or quote you prices on stock tops. CENTRAL AUTO TOP CO., Indianapolis, Ind.

1909 Haynes 7-passenger car, magneto, fully equipped, electric light, Newtone horn, etc., $500. Would trade for automobile supplies or small runabout. 1507 Bushwick Ave., Brooklyn, N. Y.

TWO expert mechanics will call and give estimate to overhaul or adjust car in you own garage. Address E. BELTZ, 2551 Belmont Ave., Bronx.



An ad. like this will cost you 60c. for each insertion.

These columns offer you an opportunity to appeal to an audience of 8,000 readers whose merchandising taste is being cultivated

For Sale—Wants—Exchange

15 cents per line of six words, cash with order; — In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

AUTOMOBILE CYLINDERS reground, new pistons and rings fitted. Garage air compressors. CAST IRON BRAZING CO., Manchester, N. H.

PARTNER WANTED—Successful owner of two California garages finds that the great growth of his business necessitates the securing of responsible assistance. Is willing to sell interest to active, enthusiastic man of ability, this partner to be either a machinist or competent accountant and buyer. Partner's investment not considered as important as his ability. Unusual opportunity. Address BOX 229, care Motor World.

7-PASSENGER Franklin, 6 cylinders. Cost $4,250. Splendid condition, $1,000. BOND MOTOR CO., 1615 Grand, Kansas City, Mo.

GARAGE, best equipment in State, 46 storage cars, good repair and supply business, best location in Essex County, good agency, long lease, low rent, for sale, $6,000 for stock, machinery, etc. Address P. O. BOX 93, East Orange, N. J.

FOR SALE OR TRADE—Farm of 120 acres, good black loam, well located on stone roads, all in cultivation; will exchange for garage in Ill. or Ind. What have you? E. E. BROOKS, 427 W. Marietta, Decatur, Ill.

PEERLESS AUTO TOP DRESSING.
A waterproof dressing for leaking mohair and duck tops and curtains. Makes old and faded tops look like new. Ask your garage and supply dealer for it.
The Columbus Varnish Co., Columbus, O.

BROKEN CRANKSHAFTS, cylinders, crankcases, flywheels, gear teeth, pistons, perfectly welded and machined ready to replace. Guaranteed and references. Machinery up to 5 tons welded. ATLAS WELDING WORKS, 74-76-78 Irving St., Rahway, N. J.

N. E. AUTO LIST AND TOURIST.
Includes weekly list of all N. E. Auto Owners, Garages, Dealers, etc., with maps, selected N. E. routes and motor news. $10.00 yearly. 138 Pearl St., Boston.

PEERLESS LINING DYE.
Dyes the cloth linings of tops and curtains a black, uniform color, covering up water stains and grease spots. Does not wash off. Ask your garage and supply dealer.
The Columbus Varnish Co., Columbus, O.

LOZIER Type H 4-cylinder touring car. Absolutely new. Demountables. Regular guarantee and equipment. Cost, $5,000. Make cash offer. 1012 N. Grand Ave., St. Louis, Mo.

PEERLESS EXTRA FINE BLACK BAKING JAPAN.
Bakes either to a high gloss finish, eggshell gloss or dull finish on lamps, radiators and fenders. Will not crack, chip or peel. Ask your garage and supply dealer.
The Columbus Varnish Co., Columbus, O.

ARE YOU in need of any additional help in any department of your business? Are you out of employment or looking for a better connection? Have you second-hand apparatus of any kind or do you want to buy second-hand material. Have you a factory site for sale or do you want to buy one? If so, use the Want and For Sale column of the Motor World. Seven words to the line, fifteen cents a line. Advertisements can be inserted over a number when it is desired and identity of the advertiser will be kept confidential.

PEERLESS BACK AND CUSHION DRESSING.
Softens the leather and will not crack, wash or rub off. Makes old leather look like new. Dries in twenty minutes. Ask your garage or supply dealer
The Columbus Varnish Co., Columbus, O.

GARAGE WITH MACHINE SHOP and living apartments, all through complete equipped and up to date, for rent or for sale, in fast growing town, on main street, on Long Island, 30 miles from New York. Owner going out of the business. Price reasonable. KAPPERTZ, Farmingdale, L. I. Tel. 21 J.

PEERLESS EXTRA FINE BLACK JAPAN.
Covers solid one coat for enameling lamps, radiators and fenders. No undercoat required. Heat does not affect it. Ask your garage and supply dealer.
The Columbus Varnish Co., Columbus, O.

COLE, Model DD 1912, seven-passenger, fully equipped, top, windshield, speedometer, two extra casings, inner tubes, electric lights, etc. Car has run less than 6,000 miles; good as new. Special reason for selling. Price, $1,100. F. O. B. Indianapolis. Guaranteed as represented. P. O. BOX 596, Indianapolis, Ind.

DRAGON REPAIR PARTS.
We manufacture and keep on hand all repair parts for the Dragon cars. We make a specialty of repairing this machine. PHILADELPHIA MACHINE WORKS, 67 Laurel St., Philadelphia Pa.

AUTO LISTS, owners, etc., of any State. S. H. CARROLL, JR., Albany, N. Y.

WANTED—A first-class man to take the agency for the latest invention on the market, a rubber cover for automobile handles called Steercase; write for full particulars. Address DEPARTMENT E, GOODYEAR RUBBER HOSE AND PACKING CO., 221 Chestnut St., Philadelphia, Pa.

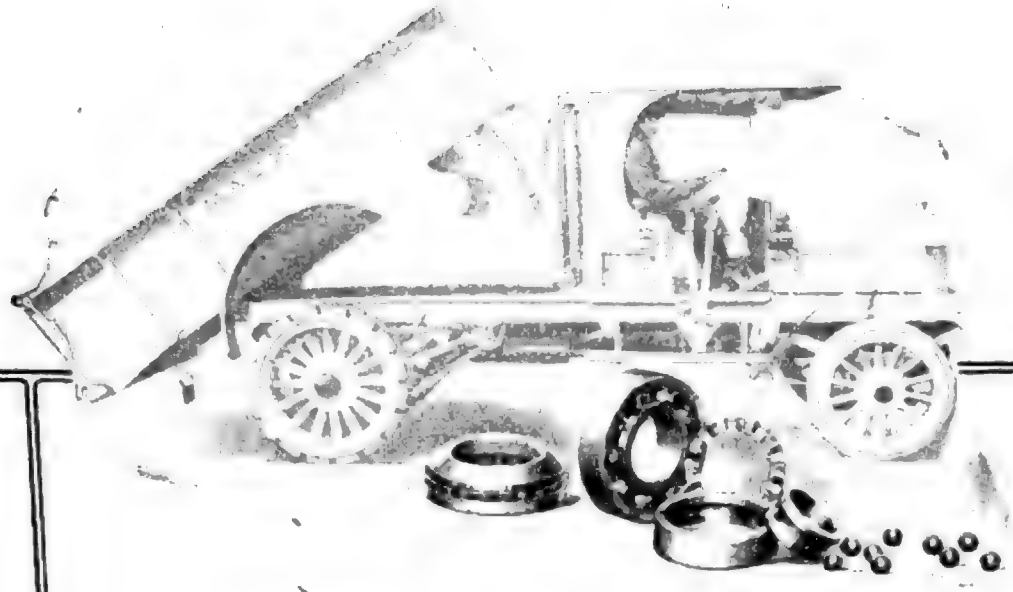
THOMAS 60 H.P. motor with clutch, transmission, Bosch high tension magneto, Stromberg carburetor, for sale cheap. Act quick. Big bargain. KAPPERTZ, Farmingdale, L. I. Tel. 21 J.

RURAL Parcels Post Delivery Car—Any party with capital and push interested in placing one on the market, correspond with E. P. COWLS, Sparta, Mich.

weekly to the highest degree by our articles on "Wide Awake Merchandising." Look at the cost as shown in the margins.

An ad. like this will cost you $1.05 for each insertion.

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Mack 7-ton truck
Equipped with
Hess-Bright Ball Bearings
throughout transmission

Hess-Bright Accuracy
and its Reasons

We have frequently mentioned the necessity of extreme hardness of balls and races in order to secure durability in a ball bearing. Hess-Bright balls are file-hard.

We have mentioned also the need of toughness in order that balls and races so hard shall not break from shock or from the strain due to hardening. Two weeks ago we gave some instances which showed the wonderful toughness of Hess-Bright balls.

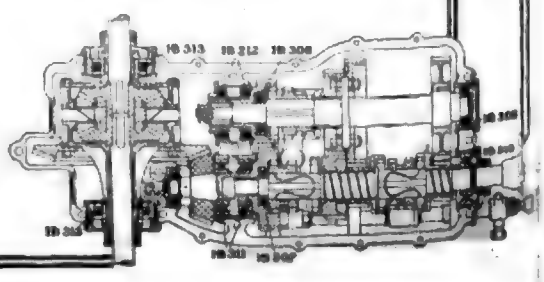
Such hardness and toughness necessitate exceeding accuracy in size and form, else one ball will bear alone the load that it should divide with its neighbors.

Even the hardest material is not wholly incompressible. Let us suppose a ball to compress 4-10,000 of an inch under its normal load. It is clear that, unless the variation in size between this ball and its mates is considerably less than 4-10,000 of an inch, some of the balls will carry less than their share of the load, and the overloaded balls will wear out too rapidly. The life of a bearing is the life of its most heavily loaded ball.

The limit of variation of the balls in a Hess-Bright bearing is 1-10,000 of an inch. This limit was not adopted as a talking point, but as a necessity. Without such close limits of error, the users of Hess-Bright Ball Bearings could not enjoy the durability to which they are entitled, and which has made Hess-Brights the standard of quality in ball bearings the world over.

HESS-BRIGHT BALL BEARINGS
Built for Endurance

THE HESS-BRIGHT
MANUFACTURING COMPANY
59 East Erie Avenue
Philadelphia, Pa.



MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXXIV
No. 4

New York, January 16, 1913

Ten cents a copy
Two dollars a year

See It
At The Shows

The First Perfect Starter

For 1913, we offer the Automobilists of America the **Electric** Disco Starter

This is, we believe, the first and only perfect Starter, and for that reason you should be sure to see it and inspect it at the Automobile Shows.

In the **Electric** Disco, you'll see a Starter that actually **SPINS** the motor.

It doesn't merely turn over the engine or crank it. By pressing a button, the engine instantly begins to **SPIN**.

It turns the engine at from 110 to 150 revolutions per minute.

That's 50 per cent. faster than any other Starter.

And it's so fast that no matter how large or how cold your engine may be, it sucks up and vaporizes the gasoline so that the car is under way a moment after pressing the button.

Even though the **Electric** Disco costs more than any other, leading auto makers are glad to build it into their cars. They are delighted at being able to secure a really **dependable** Starter. Ask for it.

The "Electric" Disco

not only **starts** the car but supplies an abundance of electric lighting power for all lamps.

It consists essentially of a small, compact Motor, a Generator af approximately the same size and a Storage Battery.

The Generator produces ample current for Starting and Lighting any car.

The entire System is a marvel of **efficiency** and simplicity.

Don't fail to see the Electric Disco at the Shows.

We promise you a genuine Sensation.

Remember, a good car **isn't** a good car nowadays unless it has an absolutely **reliable** Starter.

At the New York Show, January 11-20—BOOTH 261, Madison Square Garden.
At the Chicago Show, February 1-15—BOOTH 149-150, Coliseum Annex.

Ignition Starter Company
Detroit, Mich.

715 Dodge Bldg.

Company, 1600 Broadway, New York

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Truffault-Hartford SHOCK ABSORBER



Why should YOU pay for equipment that rightly belongs on the car YOU sell?

How often have YOU consented to a demanded piece of equipment to be paid for at your own expense rather than have a dissatisfied customer?

You no more overstep your rights in insisting that the manufacturer YOU represent fully equip his cars at the factory—than do your customers who have learned that certain equipment belongs on every car, to be looked for and demanded.

Thousands of cars come from their factories equipped with the Truffault-Hartford Shock Absorbers in response to a strong, broad, ever-growing demand from car buyers.

Twenty-seven car manufacturers hold that it is essential to complete comfort, safety, and economy—consequently to the very reputation of their product. And they protect their dealers' interests by including it as standard equipment.

YOU are entitled to this consideration from YOUR manufacturer and the right kind of insistence gets it.

HARTFORD SUSPENSION CO. Factory 164 Bay Street **Jersey City, N. J.**

EDW. V. HARTFORD, President

BRANCHES:

NEW YORK—1700 Broadway
NEW YORK—212-214 West 88th St.
JERSEY CITY—141-143 Morgan St.
BOSTON—319-325 Columbus Ave.
CHICAGO—1458 Michigan Ave.
DETROIT—803 Woodward Ave.
KANSAS CITY—1524 Grand Ave.
NEWARK—289 Halsey St.
PHILADELPHIA—1437 Vine St.
ASBURY PARK—Ocean and 3rd Aves.
INDIANAPOLIS, IND.—448-450 N. Capitol Blvd.
BRETTON WOODS, N. H.—Bretton Woods Garage

DEALERS

Be Sure Your Cars Are

EQUIPPED

With

The World Moves Easier
When Mounted On

R·I·V BALLBEARINGS



DEALERS

Bearings of Recognized Worth are Ear Marks of Car Quality

DEALERS

Are the Cars You Represent R.I.V Equipped?

Year by year more conservative car manufacturers are backing their belief in R. I. V. super-quality by using these bearings on their entire outputs.

Dealers who are investigating the ball bearing situation can assure themselves that R. I. V. Ball Bearings must measure up to the highest standards of uniformity of materials, structural perfection and accuracy of workmanship.

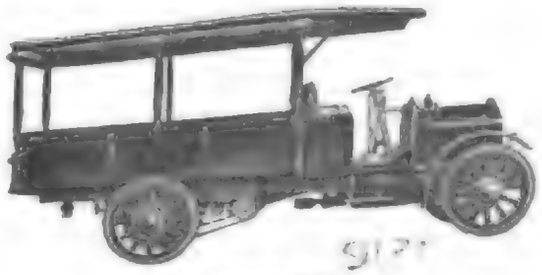
In reaching and holding to these standards, the R. I. V. Company maintain chemical and physical laboratories where every ball, retainer and raceway undergoes inspection from start to completion and where quality of material is proved from raw to finished product.

Get the facts that prove our contention that R. I. V. Ball Bearings are accurate, durable and almost frictionless. Then, recommend them more! Boast of them as equipment on the cars you sell.

R. I. V. COMPANY, 1771 Broadway, New York

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The Selden Truck



$2000

(Price includes chassis with driver's seat, lamps and tools—body extra)

Don't be satisfied with only a moderately good truck, but get the best you can for your money.

The Selden One-Ton Truck affords infinitely greater value than any truck in its class. A detailed comparison with other trucks will convince you of th's fact.

The Selden Truck, like any structure which is the product of skillful, competent engineers, is built with a large factor of safety. In other words, the Selden Truck is built without any structural weaknesses, and is made to withstand the stresses and strains of hard, constant service without injury or undue wear.

It can be bought on time payments by those who do not find it convenient to pay cash, and is therefore, available to thousands of concerns that have been waiting for just such an opportunity to add to their business organization, the only efficient and economical means of distribution and delivery.

We have some valuable territory open for live responsible dealers who want to increase their profits by taking on the best selling proposition ever offered.

Write at once and get the details of the Selden Truck and of our selling plan, and give us particulars regarding your sales and service facilities.

We will exhibit at New York and Chicago Shows
NEW YORK, January 20-25, Madison Square Garden, space 111 A.
CHICAGO, February 10-15, Coliseum, Section A.

SELDEN TRUCK SALES CO.

179 East Avenue, ROCHESTER, N. Y.

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MONOGRAM OIL

REMEMBER

¶ We make greases and soaps and they are just as good quality as our oils.

¶ MONOGRAM Yellow Cup and Gear Greases are made in all weights.

¶ MONOGRAM Graphite Greases—similar to our Yellow Greases except with the addition of chemically pure graphite.

¶ MONOGRAM Non-Liquid Oil—is a spongy, fibrous grease made in four weights.

¶ MONOGRAM Automobile Soap — is a pure linseed oil product.

¶ MONOGRAM Hand Cleaner —removes grease, oil and other stains—will not injure the hands.

¶ All put up in lithographed metal packages, kegs, ½ barrels and barrels.

A post card request will bring one of our miniature can paper weights

NEW YORK LUBRICATING OIL CO.

Consolidated with

Columbia Lubricants Co. of N. Y.

110 Broad Street, New York City

BRANCHES AT NEWARK, BOSTON, CHICAGO, CLEVELAND, PHILADELPHIA, SEATTLE, SAN FRANCISCO, LOS ANGELES, SPOKANE, LONDON, ENGLAND; JOHANNESBURG, SO. AFRICA

$985 *Completely Equipped*

Overland

$985 *Completely Equipped*

High-Priced Feature No. 11

Every operation on every part and every assembly of parts of an Overland Model 69T is rigidly inspected at each step in the progress of the car's creation.

After the parts are thoroughly completed and machined ready for assembly they are tested:—

To determine physical properties pertaining to tensile strength, elasticity, hardness, ductility, size, shape, angularity, etc.

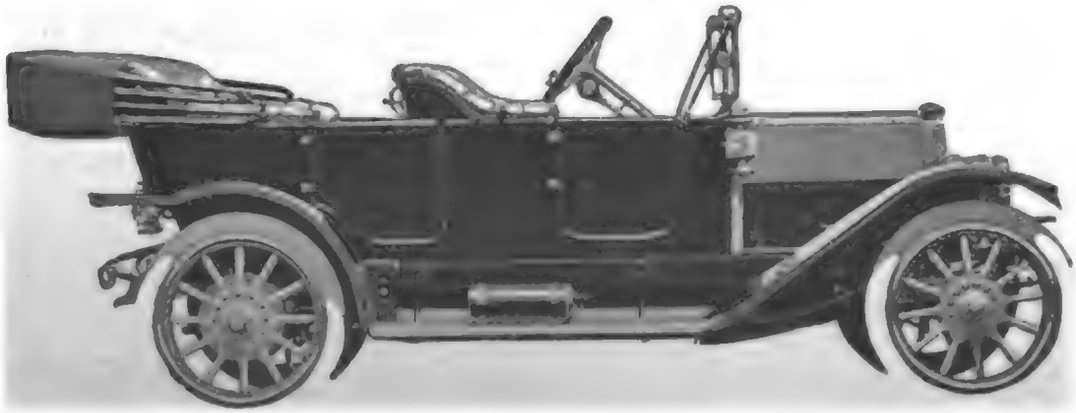
All gears are tested not only for dimensions, but also as to bores and centers. Each single cylinder is accurately gauged, thus assuring interchangeability.

Every camshaft is tested out by means of more special testing equipment. And so it is with every part which goes in the Model 69T.

Such high priced workmanship is available in the 69T for $985—only because we make 40,000 a year.

Let us mail you some interesting literature. Please address Dept. 50.

The Willys-Overland Company
Toledo, Ohio



MOTOR WORLD

Vol. XXXIV New York, U. S. A., Thursday, January 16, 1913 No. 4

REORGANIZED U.S. MOTOR ASSUMES MAXWELL NAME; ADDS $6,000,000

Standard, Name First Chosen, Found to Conflict with Titles of Many Other Companies—Accepted Bid Nets $7,693,000—Flanders Cars to Become Maxwells—Columbias Discontinued.

Not the $31,000,000 Standard Motor Co. but the Maxwell Motor Co., capitalized at $37,000,000, will succeed the United States Motor Co. It was found that the name first selected conflicted with the titles of existing corporations in other States, and the name Standard, therefore, could not be employed. The Delaware charter, however, will be retained.

Also, the Maxwell and the Stoddard-Dayton cars will be the only ones of which the manufacture will be continued by the new company. Even the Flanders "sixes" which will be acquired when the deal for the Flanders Motor Co., of Detroit, is formally ratified, will lose their identity and become Maxwells. The Columbia, Brush and all other cars, as Motor World exclusively stated, will be discontinued.

The sale of the assets of the United States States Motor Co. and its subsidiaries was approved by Judge Hough in the United States District Court on Friday last, 10th inst., when he accepted the alternative offer of the only bidders, H. G. Holt and William McAllister, Jr., representing the reorganization committee, the alternative bid being on a percentage basis. The first bid was in the nature of an offer of a lump sum of $7,080,000, from which certain expenses of the receivership, which was instituted September 14th last, must have been met. On the percentage basis, the offer—which was accepted—was 32½ per cent. of its liabilities for the United States Motor Co.; 24 per cent. for the Alden Sampson Mfg. Co.; 33 per cent. for the Brush Runabout Co.; 91 per cent. for the Columbia Motor Car Co.; 39 per cent. for the Dayton Motor Car Co., and 60 per cent. for the Maxwell-Briscoe Motor Co.

On this basis, the amount paid for the several properties foots up $7,693,080, as follows:

Company.	Liabilities	Assets.	Per Cent.
U. S. Motor.....	$12,800,000	$4,590,724	$4,160,000
Alden Sampson ..	1,133,020	308,238	271,924
Brush Runabout..	1,081,146	409,842	248,663
Columbia Motor..	440,940	452,439	392,155
Dayton Motor....	2,653,633	1,125,504	1,038,086
Maxwell-Briscoe .	2,637,088	1,590,881	1,582,252
	$20,735,827	$8,477,628	$7,693,080

Henry Wollman, the attorney who represented the Lyons-Atlas Engine Works, of Indianapolis, and who protested against the

(Continued on page 6.)

Nonpareil Goes into Electric Horns.

The Nonpareil Horn Mfg. Co., of New York, which has been one of the large factors in the bulb horn industry, has seen a light and, having seen it, is preparing to cut a figure in the electric horn business also. To that end it has acquired the Eastern representation of the Cubit $3 vibrator horn, made by the Kosmak Electrical Co., of Jersey City. The transaction carries with it an order for 100,000 Cubit horns.

Bid of $56,000 for Halladay Assets.

At the trustees' sale on Tuesday last, 14th inst., of the assets of the Streator Motor Car Co. of Streator, Ill., maker of the Halladay car, the Merchants' Realization Co. of Chicago offered $56,000 for the finished cars and parts on hand and the machinery. The purchase, however, does not include the factory buildings nor any part of the real estate.

AMALGAMATION OF BOARD OF TRADE AND N.A.A.M. NEAR CONSUMMATION

Board of Trade Gives Definite Approval and N. A. A. M. is Also Committed—Automobile Chamber of Commerce to be Title of New Body—Board of Trade Re-elects Clifton for Ninth Time.

After more than a year of negotiations between committees representing the respective organizations, the amalgamation of the National Association of Automobile Manufacturers and the Automobile Board of Trade has reached the point where its consummation is beyond shadow of doubt.

Since the movement first took form in the appointment of conference committees, there has been small question that ultimately the consolidation would be brought about, as it was known that the sentiment of both associations favored it, but the getting together on a mutually satisfactory basis proved far more difficult than appeared on the surface.

The conference committees—Messrs. Waldon, Bennett and Pope, representing the N. A. A. M., and Messrs. Hanch, Davis and Kittredge, representing the A. B. T.—have held a number of meetings, formal and otherwise, during the year, but it was not until two months ago that the more serious obstacles were removed and amalgamation practically assured. It was made certain on Tuesday last, 14th inst., at the annual meeting of the Board of Trade, when, by a unanimous vote, that body approved the recommendations of its committee and placed itself on record as favoring the creation of a new organization to be known as the Automobile Chamber of Commerce.

The amalgamation plan is now being presented by mail to the members of the N. A. A. M., whose ratification of it already is assured, the entire executive committee speaking for itself and for the members of the N. A. A. M., already having agreed to the conditions.

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The plans provide that the Chamber of Commerce, which will be incorporated under the laws of New York, shall take over all assets of both organizations, which includes the Associated Patents Co. controlled by the Board of Trade.

The membership scale will be the same as now prevails in the Board of Trade: i. e., one-tenth of one per cent. of the wholesale price of the cars produced each year, all profits derived from shows being rebated pro rata to the members. The membership dues was one of the knots which required considerable time to unravel. The N. A. A. M. fee is but $25 per year, but the receipts from the shows are retained in the treasury, and those who favored the Board of Trade plan, and who finally prevailed, maintained that it is undesirable to bank up a lot of idle money.

When the amalgamation formally is consummated, the Chamber of Commerce will have a membership of 110. Practically all of the members of the Board of Trade are already members of the National Association; in fact, they have dominated its affairs for many years past.

At Tuesday's meeting of the Board of Trade, Charles Clifton, of the Pierce-Arrow Motor Car Co., for the ninth time was re-elected president, all of the other incumbent officers also being retained, as follows: Vice-president, C. C. Hanch, Nordyke & Marmon Co.; secretary, R. D. Chapin, Hudson Motor Car Co.; treasurer, George Pope, Pope Mfg. Co. These officers and S. T. Davis, Jr., Locomobile Co. of America, and Hugh Chalmers, Chalmers Motor Co., constitute the board of directors. H. A. Bonnell was retained as general manager.

New Empire Incorporates for Million.

The Empire Tire & Rubber Co., of Trenton, N. J., which grew out of the consolidation of the Empire Tire Co. and the Empire Rubber Mfg. Co., has been incorporated under the laws of New Jersey with a capitalization of $1,000,000, consisting of $500,000 preferred and the same amount of common stock. The old companies were incorporated at $250,000 each, all common stock, and the new common is divided among the holders of the old stock on a share-for-share basis. The preferred is held largely by members of the new company. C. Edward Murray, the treasurer and general manager, holding a block of nearly $200,000. The other officers are: President, C. H. Baker, former president of the Empire Rubber Mfg. Co.; vice-president, J. Cornell Murray; secretary, A. Boyd Cornell, former secretary of both companies. C. Edward Murray was treasurer of both companies and he now will combine those duties with the general management.

REORGANIZED U. S. MOTOR ASSUMES MAXWELL NAME

(Continued from page 5.)

acceptance of the bids when they first were submitted to the court on the 8th inst., renewed his objection at the later hearing. He repeated his opinion that even the percentage offer was insufficient and pointed out that the reorganizers were about to issue $31,000,000 of stock against property which it had purchased for about $7,000,000, plus $3,000,000 in cash. He also drew attention to the fact that real estate carried at $7,850,000 had been appraised by the receivers at only $2,600,000.

Judge Hough remarked that the condition of the corporation was one of the most peculiar and involved with which he ever had to do, because of the inter-relations of the various companies and the cross-claims growing out of the two-name notes which had been issued.

Attorney Wollman asked the court to direct the reorganizers to bid at least as high as the appraisers' price, $8,427,000. Judge Hough, however, refused to do so, and finally ordered the acceptance of the percentage bid, but he remarked that if he had reason to believe that the creditors who had assented to the reorganization plan would benefit to a greater degree than the non-assenting creditors he would reject the bid. He, however, thought that no such reason existed, stating as his conviction that the percentages quoted by the bidders represented the extreme gross value of any given claim. Attorney Wollman subsided and, although he at one time had intimated that he might apply for an injunction restraining the transfer of the property, he since has decided to permit things to take their course. Judge Hough set January 29th as the date for the consideration of the distribution of the assets of the company.

The property acquired by the reorganizers comprises the Maxwell-Briscoe plants in Auburn, R. I., Tarrytown, N. Y., and Newcastle, Ind.; the Brush and Alden Sampson plants in Detroit; the Stoddard-Dayton factory in Dayton, O., and the Columbia plant at Hartford, Conn.

After the readjustment is completed, the originally contemplated capitalization, $31,000,000, will be increased to $37,000,000 to pay for the Flanders Motor Co. when it is formally taken over. The transaction will be purely in the nature of a stock deal.

It is certain that not all of the plants acquired will be continued, and among those whose future is shrouded in doubt is the Columbia plant in Hartford. The Maxwell plant in New Castle, Ind., it is stated, will be converted into a parts replacement plant —that is, it will be devoted solely to the manufacture of spare parts for all of the many cars which were produced by the United States Motor Co.

As is already known, the officers of the new Maxwell Motor Co. will be Walter E. Flanders, president and general manager; William F. McGuire, first vice-president and assistant general manager; Carl Tucker, second vice-president and treasurer; M. B. Anthony, comptroller.

Flanders, as is well known, is the head of the Flanders Motor Co., in which he was joined several months since by McGuire, who previously was production manager for the Ford Motor Co.; Carl Tucker, the treasurer, is a relative of Anthony N. Brady, the New York financier, who was as deeply interested in the old company as he is in the new one; M. B. Anthony, the comptroller, is a former member of a firm of chartered accountants. All save the treasurer, who will remain in New York, will be located in Detroit, to which city the headquarters of the big company already have been removed.

According to the terms of the reorganization plan, the merchandise and banking creditors will receive 25 per cent. in cash and 25 per cent. first preferred, 25 per cent. in second preferred and 15 per cent. common stock, a total of 90 per cent. The holders of preferred stock will receive 24 per cent. in first preferred shares, 25 per cent. second preferred and 30 per cent. common, a total of 77 per cent. Holders of common stock will receive 24 per cent. in first preferred, 17½ per cent. second preferred and 30 per cent. common, a total of 71½ per cent.

The holders of the $6,161,000 debentures will receive 50 per cent. in first preferred, 50 per cent. in second preferred and 40 per cent. in common, which makes a total of 140 per cent.

On the basis of the bid accepted by the Court, an attorney for one of the largest creditors of the United States Motor Co. estimates that the 90 per cent. settlement will be equivalent to about $49 in real money on each $100 merchandise claim, the amount figuring out as follows:

$25 in cash	$25.00
$25 1st pref. at 60%	15.00
$25 2nd pref at 30%	7.50
$15 common at 7%	1.50
$90	$49.00

Hughes to Manage Buick Sales Abroad.

Herbert Hughes, for the past six years with the Packard Motor Car Co., has transferred his allegiance to the Buick Motor Co. and will assume charge of its European sales. He will sail from New York to London on January 22nd. As Hughes had two years' experience as manager of Packard sales in Paris, he is no stranger to his duties.

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SPEEDOMETER PROFITS FOR FOUR YEARS EXCEED $801,000

Figures Brought Out by Offer of Stewart-Warner Stock to Public —Combined Assets Total $1,750,000.

Having completed all of the requirements, White, Weld & Co. are offering for sale 7 per cent. cumulative preferred stock of the Stewart-Warner Speedometer Corporation, which only last month took over the properties of the Stewart & Clark Mfg. Co. in Chicago and the Warner Instrument Co. of Beloit, Wis. It is offered at par and accrued dividends and is redeemable three years after issue as a whole or in part at 110 and accrued dividends.

The total capitalization of the Stewart-Warner Speedometer Corporation is $11,000,000, of which $10,000,000 is represented by common shares. Only the preferred, however, is being offered for public subscription. It is preferred both as to assets and dividends, the latter of which are payable quarterly.

The conditions provide that no further issue of preferred stock may be made without the consent of the holders of at least the majority of the outstanding preferred, and that no mortgage may be placed on the property without the approval of the holders of at least 75 per cent. of preferred stock outstanding, such approval, however, not being necessary for the issue of debenture bonds.

If the corporation sells or otherwise disposes of any of its substantial manufacturing plants the proceeds of the sale must be applied to the redemption of as much of the preferred stock as possible. Also it must pay into the sinking fund on or before December 31st next the sum of $65,000, and semi-annually thereafter the sum of $32,000. The money paid into the sinking fund will be used for the redemption of the preferred stock at or under $110 per share and accrued dividends, the redemption to be made by invited sealed offers from all preferred stockholders, the lowest offering, of course, to be accepted.

The preferred stock has equal voting power with the common stock, but the certificate of incorporation provides that no dividends shall be paid on the common which shall reduce the amount of the net quick assets below 80 per cent. of the par value of the outstanding preferred.

According to the report of the certified accountants, the combined net earnings of the Stewart & Clark and Warner companies for the four years ending October 31st last averaged more than $801,000 per year, the earnings each year being as shown by the following table:

1909	$585,000
1910	825,000
1911	870,000
1912	925,000

It is estimated that as a result of the settlement of the patent litigation between the two companies, the earnings for the calendar year of 1913 will be in excess of $1,100,000. The combined net tangible assets of the two companies on October 31st last were in excess of $1,750,000, no allowance being made for goodwill or the patents, which it is believed dominate the production of speedometers employing the magnetic principle. On the same date, the combined net quick assets were in excess of $850,000.

The Stewart-Warner Speedometer Corporation has no bonded debt and all of its property is free from mortgage.

Keeton Acquires a Plant in Detroit.

The Keeton Motor Car Co. has purchased four buildings, comprising the former Oliver Motor Car plant and occupying about 1½ acres, at Beckinbridge street and Lawton avenue, Detroit, of which immediate possession was taken. The business offices already have been moved to the new location, and it is expected that before the end of the month the factory itself will be in operation. Three of the buildings are 220 x 80 feet each and the fourth 140 x 80 feet; a fifth, 220 x 80 feet, will be erected at once. Temporarily, the Keeton car has been produced in a plant located in the city of Wyandotte, Mich.

Briscoe's New Car Assuming Shape.

Benjamin Briscoe, former president of the United States Motor Co. and the Maxwell-Briscoe Motor Co., who is now in Paris developing a low-priced touring car with the aid of a corps of European experts, expects to return to America during May next, when the plans of his new company and the details of the car itself will be announced. He predicts that the newcomer "will revolutionize present motor car values for a car of first quality at a remarkably low price."

Ford Repudiates a Silly Rumor.

Although it was so silly as to cause wonder that it ever was put into print, a report that the Standard Oil Co. had purchased the Ford Motor Co. of Detroit aroused such extensive inquiry that the Ford company has been compelled to issue a sweeping denial, as was to have been expected. Not only was there no truth in the report, but there have been no negotiations with Standard Oil people, or with anyone else, for the sale of all or any part of the Ford company or its stock.

$14,000,000 IS TOTAL OF PACKARD'S 1912 BUSINESS

Gain Over Volume of Sales for 1911 is $3,000,000—Gross Earnings Exceed $3,000,000—Heroic Action Reduces the Surplus.

During the fiscal year which ended August 31, 1912, according to the financial report which just has been made public, the gross sales of the Packard Motor Car Co. of Detroit, Mich., including commercial vehicles, amounted to $14,613,057.27, as against $11,624,588.37 during the previous twelvemonth. The gross earnings for 1912 were $3,412,862.05 and the net $2,182,376.20, there having been charged off for depreciation on buildings, machinery, tools and developments the sum of $1,230,485.85. The depreciation account for the previous year aggregated $572,001.37.

Despite the greatly increased sales and earnings, the surplus of the Packard company was reduced from $2,984,021.81 to $1,198,783.82. It is partly accounted for by the increased sum charged to depreciation, but more particularly by the sum of $3,274,958.89, which had been carried on the books for "rights, privileges, franchises, developments, patents, etc.," and which was cut to the nominal sum of $1 by heroic decision of the board of directors. Similarly $342,656.30 was deducted "to adjust books to inventory taken December 31, 1911."

Although the company has regularly met the dividends on its preferred stock issue of $5,000,000, no dividends on common stock have been paid for the last three years, all of the Packard earnings in excess of the preferred stock dividend going into the capital account. In his report to the stockholders, however, Henry B. Joy, president of the company, says he "feels confident that the current year will see the resumption of payments of a small dividend rate on the common stock," but he adds that the "largest share of the earnings must be, however, added to the working capital to meet added requirements of increased volume of business."

The total receipts during the fiscal year amounted to $17,328,472.51 and the total disbursements to $16,464,930.09. On August 31, 1912, the cash on hand amounted to $1,030,513.95, as against $106,971.53 on the same date of the previous year.

The total resources aggregated $14,663,298.86, which compares with $16,110,756.28 at the same period in 1911.

The current assets increased from $1,160,474.71 to $2,493,999.46, the greater portion being accounted for by the increased cash on hand and by vehicles in transit to deal-

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ers and branches, the former representing a valuation of $340,090.27 and the latter $672,130.23, as against $372,712.30 and $352,973.93, respectively, at the same period of the year 1911.

The liabilities, including reserves and surplus, equal the resources, the chief item being comprised of the capital stock, $10,000,000, and $2,000,000 of five-year debenture notes which were issued at the beginning of the fiscal year for the purpose of funding the floating debt. The issue authorized was $3,000,000, but $1,000,000 is held in reserve in the treasury. President Joy remarks, however, that "our inventory is increasing on account of greater volume of business which necessarily limits our margin of free cash and we, therefore, may be borrowers again during the year."

The detailed report of the treasurer, Philip H. McMillan, is as follows:

GENERAL BALANCE SHEET

Resources:

Plant—		
Real Estate (at cost)	$285,312.49	
Buildings	2,084,865.81*	
Machinery	1,145,381.22*	
Equipment — Boilers, Engines, Generators, Motors, Elevators, Shafting, etc.	1,041,459.64*	
Fixtures	245,756.15*	
Tools	250,000.00*	
Paid on New Buildings in Progress	30,803.34	
Development — Drawings, Patterns, Models, etc.	138,000.00*	
Rights, Privileges, Franchises and Inventions	1.00†	$5,221,579.65
Investment in Branch Houses		1,446,079.02
Investment Account—		
41 Bonds C. & N. W. Ry. Co.		38,232.50
Stock Option Contracts with Employes		112,200.00
Material Stock—		
Raw and in Process and Finished Vehicles		5,381,217.23
Current Assets—		
Cash	$1,030,513.95	
Vehicles in Transit to Dealers	340,090.27	
Vehicles in Transit to Branches	672,136.23	
Accounts Receivable	132,290.80	
Bills Receivable	188,095.03	
Expense paid in Advance	130,864.13	2,493,990.46
		$14,663,298.86

Liabilities:

Capital Stock—		
Common Capital Stock	$5,000,000.00	
Preferred Capital Stock	5,000,000.00	$10,000,000.00
Payables—		
Debenture Notes Due December 1, 1916	$2,000,000.00	
Accounts Payable: Invoices, Accrued Pay-Roll, Vouchers not due, Deposits on Vehicle Orders, etc.	11,75,710.33	3,175,710.33
Reserves—		
Accrued for Interest, Taxes and Insurance		288,804.71
Surplus—		
After deducting all charges		1,198,783.82
		$14,663,298.86

* Depreciation for current year deducted, aggregating $1,230,485.85.
† Reduced by action of Board of Directors from $3,274,958.89 to $1.00.

DETAILS OF SURPLUS ACCOUNT.

Surplus at Beginning of Fiscal Year		$2,984,021.81
Gross Earnings for Current Year	$3,412,862.05	
Less—		
Depreciation on Buildings, Machinery, Tools and Development	1,230,485.85	
Net Earnings for Year	2,182,376.20	
Less Dividends on Preferred Stock	350,000.00	
Net Surplus for Current Year		1,832,376.20
Making a Total Surplus of		$4,816,398.01
From which the Board of Directors has authorized that the following deductions be made:		
To reduce the amount at which "Rights, Privileges, Franchises, etc." has been carried on the books of the Company from $3,274,958.89 to $1.00	$3,274,957.89	
To adjust Books to Inventory taken December 31, 1911	343,656.30	3,617,614.19
Leaving a Net Surplus at August 31, 1912		$1,198,783.82

Hartz Becomes President of R. C. H.

At the annual meeting of the directors in Detroit, on Friday last, J. F. Hartz was elected president and treasurer of the R. C. H. Corporation. He first entered the company in November last, when he was elected treasurer, which office he also will retain. R. C. Hupp, the former president, was elected vice-president, and C. P. Seider, who entered the company at the same time as Hartz, was chosen secretary. These officers and the following constitute the board of directors: G. W. Rogers and J. G. Robertson, of Akron, O.; John Kelsey and Joseph Clark, of Detroit, Mich.; C. C. McCutcheon, of Jackson, Mich.; G. Jahn, of New York. Jahn succeeds F. M. Randall, of Detroit, who resigned.

The new president is the head of the C M. Hall Lamp Co., of Detroit, and is interested in a number of other Michigan enterprises. Peyton R. Janney, who became general manager of the R. C. H. Corporation on January 1st, will continue in that office, and Fred R. Bump will remain assistant general manager.

The R. C. H. Corporation has executed a mortgage on its property which will render available the sum of $300,000.

Tate to Build Factory for Electrics.

Tate Electric, Ltd., which was formed several months ago to produce electric vehicles in Walkerville, Ont., has accepted plans for a factory which will be erected on St. Luke road; it will comprise a two-story brick and steel building which will afford 42,000 square feet of floor space. Albert Kaltschmidt has been engaged as factory and production manager. The directors of the company are Henry and N. A. Timmins, W. Scott Hutchinson, C. E. Archibold and S. Carsley, of Montreal, and D. A. Dunlap and A. O. Tate of Toronto.

Brown Interests Form Castings Company.

To facilitate their operations, the principals of the Brown Commercial Car Co. of Peru, Ind., organized the Peru Castings Machine Co. and purchased the former plant of the Otis Elevator Co., in which the castings will be produced. The main building of the newly acquired plant is 300 x 88 feet and is of brick and modern foundry construction. It will be under the immediate direction of J. H. Barbee, mechanical engineer, E. E. McCampbell and R. A. Carter, who, like Barbee, are practical foundrymen from Milwaukee.

Car Exports Gain 30 per Cent. in Value.

The exportation of automobiles from the United States for the month of November last showed a gain of 24 per cent. in number over the same month of 1911 and a gain of 30 per cent. in value; the comparative shipments were: November, 1911, 1,364 cars valued at $1,382,804; November, 1912, 1,689 cars valued at $1,807,066, gains of 325 in number and $424,262 in value. The value of the parts for these same months, not including engines and tires, was $214,638 and $300,655. Of the 1,689 cars exported in the latter November 31 were commercial vehicles, valued at $56,176, an average of $1,812.

The engine exports were: November, 1911, 318 engines valued at $38,248; November, 1912, 480 engines valued at $92,719. The total of cars, parts and engines for the first 11 months of 1911 was $17,088,692, and for the same period of 1912, $26,916,574. For the former period engine figures are available only after July, because of the method of keeping statistics in use prior to that time.

Demory to Interview the Sphinx.

A. R. Demory, second vice-president and factory manager of the Timken-Detroit Axle Co., is booked to sail on the Cedric January 21st "to consult the Sphinx on tendencies in axle construction," as one of his associates entertainingly expressed it. After his interview with the silent sentinel of the Pyramids he will accompany his wife and brother-in-law to Naples, Rome and the Riviera. From thence the Timken tourists will proceed to Vienna and Berlin, concluding their travels with a motor car tour through England.

Out of Diamond Into Miller Tires.

H. C. Miller and H. C. Mills, both of whom were long in the service of the Diamond Rubber Co.—the former for 13 years, the latter for eight—have formed the Miller Tire Sales Co., of New York, for the purpose of handling Miller tires in this part of the country. They will open for business February 1st.

Fisk to Locate Branch in Winnipeg.

On February 1st, the Fisk Rubber Co. will open a branch in Winnipeg, Manitoba, at 307 Fort street, which it is promised will be the most complete tire house in the Dominion. It will be in charge of R. Phillips.

The Week's Incorporations

Hartford, Conn.—Capitol City Electric Garage Co., under Connecticut laws; to operate a garage.

Norwich, Conn.—Uncas Garage Co., under Connecticut laws; authorized capital, $2,000; to operate a garage.

Harrisburg, Pa.—Fischer Auto Supply Co., under Pennsylvania laws; authorized capital, $5,000; to deal in motor car supplies.

Ottawa, Can.—League of Canadian Automobilists, under Ontario laws; authorized capital, $1,000,000; to deal in motor cars and supplies.

Jackson, Mich.—McByrne Garage Co., under Michigan laws; authorized capital, $15,000; to operate a garage. Corporators J. M. Byrne and others.

Spokane, Wash.—Fox Co., under Washington laws; authorized capital, $1,000,000; to manufacture spring wheels. Corporators—P. C. Fox and others.

Richmond, Ky.—Madison Garage, under Kentucky laws; authorized capital, $2,000; to operate a garage. Corporators—Roy Montgomery and others.

Cincinnati, Ohio—Herman Motor Co., under Ohio laws; authorized capital, $30,000; to manufacture motor cars. Corporators—Charles Eissen and others.

Elyria, Ohio—J. & H. Taxicab Co., under Ohio laws; authorized capital, $2,500; to operate taxicabs. Corporators—A. L. Jackson, M. F. Harrison, L. B. Fauver.

Minden, Ia.—John Ehlers & Co., under Iowa laws; authorized capital, $12,000; to deal in motor cars. Corporators—John Turk, John F. Reimers, John Ehlers.

Omaha, Neb.—Paige Co. of Nebraska, under Nebraska laws; authorized capital, $10,000; to deal in motor cars. Corporators—Byron M. Burbank, E. S. Burbank.

Mt. Vernon, Wash.—Pacific Auto Co., under Washington laws; authorized capital, $6,000; to deal in motor cars. Corporators—W. J. Stanhope, Ernest Peterson and others.

Toledo, Ohio—Kero-Carburetter Co., under Ohio laws; authorized capital, $25,000; to manufacture carburetters. Corporators—M. O. Rettig, H. C. Lyon, W. J. Brunn.

Kansas City, Mo.—Hanna Motor Mfg. Co., under Missouri laws; authorized capital, $60,000; to manufacture motor cars. Corporators—John M. Frank, Roy J. Hanna.

Louisville, Ky.—Standard Auto Co., Kentucky laws; authorized capital, $25,000; to deal in motor cars. Corporators—Geo. A. Dunham, Clifford L. Alderson, J. H. Alderson.

Louisville, Ky.—Speedway Tire Co., under Delaware laws; authorized capital, $250,000; to manufacture tires. Corporators—H. L. Lewman, F. Haunt, W. N. Cox, all of Louisville.

Spokane, Wash.—Spokane Taxicab Sales Co., under Washington laws; authorized capital, $10,000; to deal in motor cars. Corporators—B. B. Riblet, Walter J. Nichols, and others.

Wilmington, Del.—Universal Motor Truck Co., under Delaware laws; authorized capital, $1,200,000; to manufacture motor trucks.

Corporators—H. E. Latter, W. J. Maloney, N. P. Coffin.

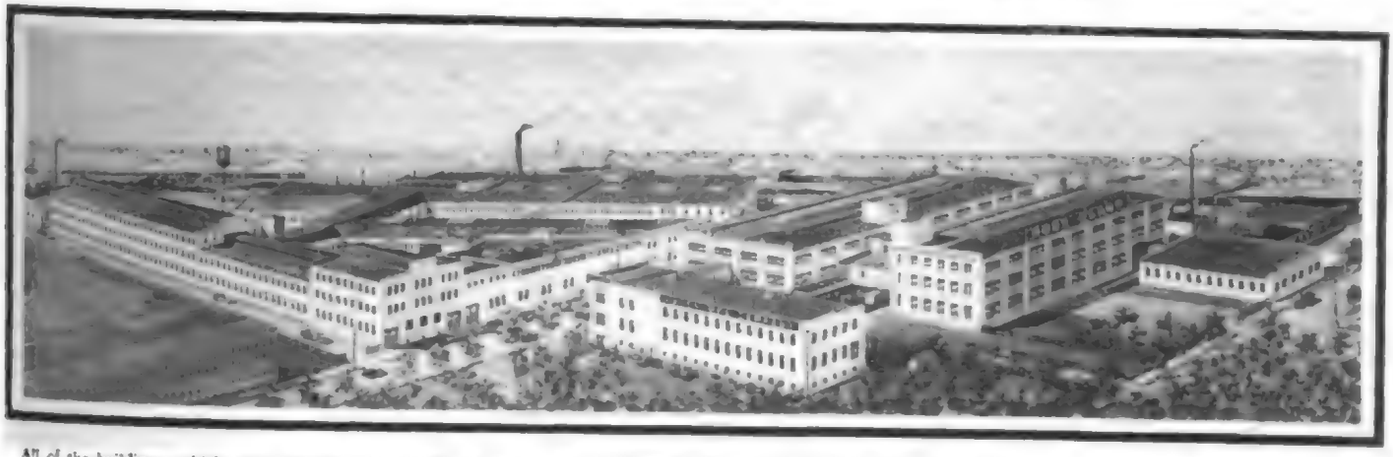
Cleveland, Ohio—Anderson Roller Gear Co., under Ohio laws; authorized capital, $100,000; to manufacture gearsets. Corporators—F. A. Barker, D. H. Foster, H. N. Anderson.

Cleveland, Ohio—Forest City Garage Co., under Ohio laws; authorized capital, $5,000; to operate a garage. Corporators—Christian Hertz, Emil C. Hertz, James T. Harding John W. Weld.

New York, N. Y.—Standard Motor Co., under Delaware laws; authorized capital, $31,000,000; to manufacture motor vehicles. Corporators—D. C. Muhleman, W. J. Maloney, H. E. Latter.

Tacoma, Wash.—Automobile Supply Co., under Washington laws; authorized capital, $20,000; to deal in motor car supplies. Corporators—John W. Reynolds, Earl C. Reynolds, and others.

EXTENSIVE PLANT OF THE HAYES MFG. CO. IN DETROIT, MICH.



All of the buildings, which cover an area of more than four acres, are employed for the manufacture of sheet metal parts that enter into automobile construction. A smaller branch factory is maintained in Indianapolis, Ind.

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Newark, N. J.—I. H. C. Motor Express Co., under New Jersey laws; authorized capital, $25,000; to operate a motor delivery. Corporators—J. B. Furber, M. F. O'Neil, H. C. Herman.

New Haven, Conn.—National Garage Co., under Connecticut laws; authorized capital, $15,000; to operate a garage. Corporators—Charles W. Lowe, Gennaro DeLucia, Christopher W. White.

Newark, N. J.—Universal Motor Truck Co. of New Jersey, under New Jersey laws; authorized capital, $50,000; to deal in motor trucks. Corporators—John Kramer, Grace Cleveland, Pasquale Mauan.

Minneapolis, Minn.—Northwestern Oakland Motor Co., under Minnesota laws; authorized capital, $100,000; to deal in motor cars. Corporators—J. W. Martin, St. Paul; M. T. Trow, A. N. Smith, Detroit.

Boston, Mass.—Pope Mfg. Co., under Massachusetts laws; authorized capital, $6,500,000; to manufacture motor cars. Corporators—A. L. Pope, G. Pope, Hartford, Conn.; P. Clapp, Lexington, Mass.

Trenton, N. J.—Empire Tire & Rubber Co., under New Jersey laws; authorized capital, $1,000,000; to manufacture motor car tires. Corporators—C. H. Baker, C. E. Murray, J. C. Murray, all of Trenton.

Phillipsburg, N. J.—Berntson Steel Wheel Co., under New Jersey laws; authorized capital, $100,000; to manufacture wheels. Corporators—J. E. Boatrite, D. H. Brillhart, F. B. Vanderstucken, all of Bethlehem, Pa.

New Albany Venture to Change Name.

The American Automobile Corporation of New Albany, Ind., which acquired the assets of the more or less famous "clink of gold" American Automobile Mfg. Co., will change its name to the Ohio Falls Motor Car Co., under which title it expects to begin active operations. F. Kahler, a New Albany manufacturer, is now president of the company, O. E. South secretary and A. C. Brock treasurer, the last two men being former residents of Cincinnati. The negotiations looking toward the amalgamation of the American Automobile Corporation with the Advance Power Co., of Chicago, which have been pending for several months, have been abandoned.

Import of Cars Again Decreases.

November last marked another drop in the importation of cars into this country. Only 87 cars, of a value of $198,351, were received, as against 96 cars, valued at $214,133, in November, 1911. The shipments for the first eleven months of 1911 and 1912 were, respectively, $1,871,414 and $1,771,935. The parts imports for the two Novembers were: 1911, $30,450; 1912, $21,863.

APPELLATE COURT CONDEMNS "CHARITY" PRICE CUTTING

Denounces Buffalo "League's" Scheme as "a Very Flimsy Device"—Terms of Klaxon Injunction Are Enlarged Accordingly.

Charity may cover a multitude of sins, but the United States Circuit Court of Appeals in New York City this week decided that that form of charity dispensed by the International Automobile League of Buffalo, N. Y., in an effort to cut list prices, constitutes "a severe strain on one's credulity." Judge Lacombe, who wrote the opinion of the court, characterized the "charity" as "a very flimsy device for evading obedience" to an injunction.

The decision was the result of an appeal filed by the Lovell-McConnell Mfg. Co. of Newark, N. J., who, in the United States District Court in Buffalo had obtained an injunction restraining the "League" from cutting the price of Klaxon horns. The Klaxon makers had asked also that the "League" be restrained from handling Klaxon horns in any way, but that part of its petition being denied, it appealed to the higher court, which, while it did not grant all that Lovell-McConnell asked, nevertheless ordered the injunction so enlarged as specifically to cover the "charity" scheme evolved by the "League" to dodge the decree.

The scheme, which was described in Motor World several months since, consisted of the "League" announcing to its "members" that while the Klaxon people insisted upon the maintenance of list prices, they did not prevent the "League" giving its profits to charity. It, therefore, announced that to all purchasers of Klaxons who would give the names of "two charitable institutions deserving of assistance" it would "select one of them and draw a check to its order for the difference between the cost to us and the retail price," the check to be sent through the purchaser in order that "it may be sure to reach its proper destination."

It was this scheme that Judge Lacombe characterized as "a very flimsy device." In his opinion, he said:

"Most of the individuals whose condition in life is such that they can afford to own and use automobiles are presumably in the habit of making regular contributions at stated periods to one or more worthy charitable institutions. When defendant tells them that if they will buy from it Klaxon horns at the price they must pay everywhere else, it will send them a cheque for $8 or $9 on each horn drawn to the order of such charitable institution as they may designate, it is naturally to be expected that they will accept the offer, will take the draft, add to it sufficient to make up their usual contribution and pass the same on to the institution.

"Probably there are other persons whose charitable vision is bounded by the horizon of themselves and their individual families. It would be an easy thing for one of them to send on two fictitious titles of what seemingly are charitable institutions, but which in reality represent merely the distress produced in this family by the payment of the full list price for a Klaxon horn. Upon receiving the draft he could write the fictitious name of the payee, and then endorse, deposit and collect it in his own name. The suggestion that defendant would undertake any investigation to discover whether or not the selected 'charitable institution' is real or fictitious puts a severe strain on one's credulity. We think this devotion of the discount from list price to 'charitable institutions' is a mere evasion of the order and that the present injunction should be modified by inserting a clause, which will put a stop to the practice. As thus modified the order is affirmed without costs."

Credit Association Chooses Directors.

At the annual meeting of the Automobile Trade Credit Association, which was held yesterday (Wednesday) at the Hotel Imperial, in New York City, F. J. Barnes, of the New York & New Jersey Lubricants Co., and D. D. Martin, of the Martin-Evans Co., were elected to the Board of Directors to take the places of J. J. Cohn, of the Nonpareil Horn Co., and Carl Kaufman, of the Motor Car Equipment Co., whose terms had expired. The directors who hold over are: U. S. Kolby, of the American Ever Ready Co.; F. A. Lemal, of the United States Tire Co.; M. J. Martin, of the Geo. A. Haws Co.; W. O. Turner, of the Lovell-McConnell Mfg. Co., and A. Waterman, of the Hartford Suspension Co.

The following firms were added to the membership roll: American Electric Co., Chicago, Ill.; Jenkins Mfg. Co., St. Louis, Mo.; Wagner Electric Mfg. Co., St. Louis, Mo.; Penn Rubber & Supply Co., Cleveland, O.

There was considerable discussion regarding the prevalence of fraudulent failures, and several methods of stamping out the evil were suggested, but no action was taken

The Crescent Air System Co. of Detroit, Mich., which manufactures the compressed air starting system of that name, has removed from the Ford building to 1199 Woodward avenue.

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In the RETAIL WORLD

R. M. Gilbert has opened a repair shop in Warren, Minn.

Lang & Fox have opened a garage in Rochester, N. Y.

Clifford Perrin, of Ashaway, R. I., is about to open a garage.

Harvey Miller is about to open a garage and repair shop in Jet, Okla.

Robert Menzie has opened a garage and repair shop in Lake Mills, Ia.

A new garage is being built in Titusville, Pa., for the Modern Garage Co.

J. H. Houser and William Gilliland have opened a garage in Ottawa, Kan.

L. Guy Dennet is building a garage on Burnham street, Cambridge, Mass.

The Thomas-Williamson Co., of Jacksonville, Fla., is erecting a new garage.

The Prouty Auto Co., of Richland Center, Wis., has completed a new garage.

The Van Motor Co. is preparing to inaugurate a taxicab service in Warren, Pa.

Jacob Gruber of Bernville, Pa., has entered the trade; he has the Ford agency.

E. C. Dow has established a garage business in San Francisco, Cal., on Dow street.

J. E. Harris plans to open a garage in Mena, Ark. He will carry the Overland line.

When completed, a garage which is being erected in Mankato, Minn., will be occupied by Alba Lewis.

H. A. Storer is about to erect a garage in Cambridge, Mass., on West street; it will cost $15,000.

The Marlboro (Mass.) Electric Co. just has completed a new garage; it is located on Garfield street.

W. G. Dandy, of Fresno, Cal., is about to enter the lists of dealers; he has secured the Haynes agency.

Samuel H. Friend has opened up in Kent, O., under the style Kent Auto Shop; the business is repairing.

Louis W. Boughton is erecting a brick garage on Clausson avenue, Brooklyn, N. Y. The estimated cost is $8,000.

Fred Lang has taken over the Panhard Garage in Carbondale, Pa. Agencies for several cars go with the business.

J. C. Williams has succeeded J. W. Adams as Cartercar dealer in Tampa, Fla. The latter has retired from the business.

Reissinger Bros. are about to construct a new garage in Louisville, Ky., at 1004 Bardstown road; it will cost $2,500.

George H. Bergstrom is about to open a garage on South Broadway, in Milwaukee, Wis. He also will secure an agency.

Charles L. Newcomb, of Anaheim, Cal., is about to build a garage; he has taken the agencies for Auburn and Hupmobile cars.

Clifford Coggins is building a garage and salesrooms in El Cantro, Cal. Its cost will be $6,000; he will handle the Buick line.

The Helmsch Automobile Co., of St. Louis, Mo., is building a new garage on North Grand avenue; it will cost $15,000.

A. H. Meester has purchased the Ellsworth (Minn.) Garage; Herman Nolte, the former owner, has retired from the business.

Walter Priester has withdrawn from the Iowa Auto & Tire Co., of Davenport, Ia. He was its secretary and treasurer for ten years.

A. C. Porcher, formerly a salesman, has entered the trade for himself in Cocoa, Fla. He has the Cadillac agency for Brevard county.

The J. S. Hoffman Motor Car Co., of Sharon, Pa., has built a new garage at Vine street; Chalmers and Overland cars are handled.

Jones & Williams, owners of the Beaumont (Cal.) Garage, have had plans drawn for a new structure; it will be located on D street.

E. Richard Meinig has accepted plans for a garage to be built in Reading, Pa., on Madison avenue; the contract names $3,000 as the cost.

P. M. Lafferty has purchased the garage business of L. E. Boger of Concord, N. C. He has changed the style to Cabarrus Automobile Co.

The Atlantic Hupmobile Co. has been formed in Atlantic, Ia. The company has the Hupmobile agency in several surrounding counties.

T. L. Longworth has purchased the repair department of the Anaheim (Cal.) Garage; he will conduct that part of the business in his own name.

Watson & Newell, of Washington, Pa., have let the contract for a brick and tile garage, 40 x 80 feet; it will stand on East Walnut street.

M. W. Skinner, of Anaheim, Cal., has entered the trade as dealer in Apperson and Reo cars; formerly he was connected with the Anaheim Garage.

McGraw & Currie are about to open a repair shop on Center street, Hibbing, Minn. They will also continue their wagon and blacksmithing business.

The Clark Summers Auto Co. has opened a garage in Sioux Falls, S. D., at 230 North Main avenue; Lambert, Cartercar and Metz cars will be represented.

The Motor Car Supply Co., of 714 South Spring street, Los Angeles, has opened a branch at 920 South Broadway; it will be kept open day and night.

The Milwaukee (Wis.) Specialty Co. has purchased a site on 7th street and will build a garage in the spring; the plans call for an expenditure of $40,000.

B. F. Sparks, of Tina, Mo., and Randall Waggaman, of Carrollton, Mo., are making ready to establish a garage buisness in Braymer, in the same State.

The Central Auto & Supply Co., of Mitchell, S. D., is erecting a new garage on 1st street; the company sells Buick, American, Moon and Hupmobile cars.

Edward Newell is about to establish a garage, repair and agency business in Grand Forks, N. D. Formerly he was a dealer in Pembina, in the same State.

C. W. Moody and John Clark plan to establish a garage business in Anderson, Ind., in the Ziegler building; both have been connected with the Nyberg Auto Works.

Curtis & Hausman, owners of the Oklah Garage, in Bartlesville, Okla., have decided to discontinue the garage trade and open an automobile supply store; cars also will be handled.

Clarence Caldwell, of Frankfort, Ind., has sold a part interest in the Caldwell Auto Garage to Harry Worlins; the style hereafter will be Service Garage. Hupmobiles are carried.

The Pugh Motor Car Co.'s garage at 584 Market street, Kingston, Pa., has been leased by W. R. Buckley and H. E. Drews; they will operate under the style Kingston Motor Car Co.

Smithling Bros., of Herkimer, N. Y., have sold their garage business, on Bellinger street, to John Murphy, of Little Falls, and

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George Lewis, of Middleville, both of which towns are in the same State.

Arthur McNall of Rochester, N. Y., has sold his garage at 14 South Union street to A. H. Dudley and has removed to larger quarters in an adjoining building. McNall deals in Peerless, Chalmers and Rauch & Lang cars.

John E. O'Neil, who conducts a sporting goods business in Lawrence, Mass., at 290 Essex street, has purchased the Metropolitan Garage, on Methuen street; Franklin Butler, Jr., the former owner, gave immediate possession.

E. Y. Jones, owner of the Joplin (Mo.) Service Co., located at 616 Joplin street, has purchased C. B. Serage's garage at No. 518, the same thoroughfare; the business hereafter will be conducted under the style Square Deal Auto Co.

Will J. Benson, who resigned as a member of the San Jose (Cal.) Improvement Co. November 1 last, has re-engaged in business in that city; he has purchased the Blanchard Garage at 434 South 1st street and will deal in Flanders cars.

R. C. Kennedy and Walter C. Morris have formed the Morris-Kennedy Co. in San Francisco; the new organization will handle the Marmon, for which Kennedy previously was dealer. Morris was connected with the marketing of Autocars.

The Columbia Supply Co., of Los Angeles, has been purchased by W. D. Newerf, the well-known tire jobber; R. Van Zandt, who was head of the Columbia company, has been made manager of the supply and accessory department of the Newerf business.

Dixon & Evans is the style of a garage and repair firm which just has been established in San Jose, Cal., at 1st and Julian streets; a car agency also will be secured. Dixon formerly was located in Warm Springs and Evans in Vallejo, in the same State.

The Selden Motor Vehicle Co., of Rochester, N. Y., has transformed its New York and Chicago branches, which were its only branches, into dealerships; the New York branch, at 1876 Broadway, was taken over this week by the Shepherd Motor Car Co., former dealer in Oakland and Everitt cars. Both pleasure and commercial cars will be handled. The Chicago branch is now a dealership in the hands of R. C. Crawford, the former branch manager; he is located at 1501 Michigan avenue, and since becoming the owner of the business has added the Metallurgique to his line.

The Union Electric Light & Power Co., of St. Louis, Mo., has withdrawn from the trade as a dealer in electrics and will confine itself to the production of electricity; General Vehicle trucks and Rauch & Lang pleasure cars, which it has sold for six years, will be handled by other representatives and the Electric Storage Battery Co. will secure a different distributor. The Union company's garage at 20th and Locust streets will be closed as soon as is feasible; C. E. Michel, former manager of the Union's automobile department, will, among other duties, act as an adviser to owners in automobile matters. The Union company entered the trade in order to stimulate the electric vehicle business in St. Louis and now feels that its mission has been accomplished.

Changes Among Prominent Tradesmen.

A. H. Smith has been promoted to the management of the Ford Motor Co.'s branch in Indianapolis. Previously he was assistant manager of the Ford branch in Cleveland.

Frank B. Hutchinson, Jr., has been appointed advertising manager of the Kelly-Springfield Motor Truck Co. of Springfield, O. Previously he was identified with two Eastern trade journels.

Fred J. Wagner has been elected president of the Right Oil Co., of New York, to succeed A. R. Pardington. Wagner only recently assumed the general management of the company, in which at all times he has been financially interested.

C. A. Swinehart has resigned the office of sales manager of the Swinehart Tire & Rubber Co. of Akron, O., his resignation to take effect February 1st. He has formulated no definite plans for the immediate future, but expects to remain in the tire business.

R. S. Hartzell, formerly with the Goodyear Tire & Rubber Co.'s branch in Detroit, has been elevated to the management of the Goodyear establishment in Cleveland. He succeeds M. Hammerle, who has been promoted to the Goodyear district office in Detroit.

Porter R. Walker, at one time connected with the Lion Motor Car Co. and later with the Grant Motor Car Co., has been appointed a special representative for the Haynes Automobile Co. of Kokomo, Ind. He will circulate in the State of Pennsylvania.

As a result of the discontinuance of the Studebaker branch in Louisville, Ky., W. W. Beeson, its manager, has been transferred to Denver, Col. He will have charge of the Studebaker Corporation's wholesale branch, which handles Colorado, Wyoming and New Mexico.

Harry W. Ford having been promoted to the post of secretary and assistant general manager of the Chalmers Motor Co. of Detroit, his former chief assistant, L. Anderson, also has been advanced a pe He has assumed the duties and title of a vertising manager.

D. W. Pinney has been promoted to th management of the Rambler branch in Ne York City. He succeeds to the vacancy cr ated by the elevation of H. A. Field to th general sales management of the Thom B. Jeffery Co., which carries with it his re moval to the factory at Kenosha, Wis.

Stephen Nelson Bourne, 2nd, has bee appointed manager of the Philadelphi branch of the F. B. Stearns Co. Previousl he represented the Stearns interests a Western sales manager, and before becom ing identified therewith he was for a numbe of years connected with the E. R. Thom Motor Co. as a Western representative.

Minor Business Troubles.

A receiver has been appointed for the Kendle Motor Car Co., of Philadelphia, Pa. The bond required was $3,500.

William J. Tynan, of Paterson, N. J., an automobile dealer, has filed a voluntary petition in bankruptcy; he has liabilities of $19,655 and assets of $5,510.

Receivers in bankruptcy have been appointed for George G. Reed, who traded as the Reed Tire & Supply Co. at 749 Boylston street, Boston, Mass. His liabilities are $20,035 and assets, $13,365.

L. L. Taylor, individually and trading as the Union Auto Garage, in Jacksonville, Fla., has filed a voluntary petition in bankruptcy; he states that his liabilities are $5,189.60, of which $3,589.60 is in unsecured claims, and his assets $1,525, with a property exemption of $725.

John S. Harrington and Daniel A. Harrington, Jr., trading under the style J. S. Harrington & Co., in Boston, Mass., at 580 Boylston street, 26 Glenville avenue and 55 Bickerstaff street, have filed apetition in bankruptcy; their liabilities aggregate $59,225 and assets are estimated at $39,113.

Recent Losses by Fire.

Ballwin, Mo.—Frank Blinne, garage destroyed. Loss not given.

Meriden, Conn.—W. F. Bowe Garage and seven cars destroyed. Loss, $5,000.

Portland, Me.—Babb & Chase, 24 Taylor street, garage damaged. Loss not given.

Kosmak Adds Capital for Enlargement.

The Kosmak Electrical Co. of Jersey City, N. J., makers of the $3 Cubit horn, has increased its capital from $10,000 to $100,000. The new money will be employed so to enlarge the business as to permit an output of 1,500 horns per day.

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MOTOR WORLD

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WALL STREET'S AUTOMOBILE INTERESTS.

When the reorganization of the United States Motor Co. is completed and the new company takes possession of the property, according to one of those high in the councils of the organization, a policy of rule by fear will be instituted—the president will be in fear of the bankers, the vice-president will be in fear of the president, and so on down to the humbler employes.

The belief appears to exist that there were too many warm-blooded friendships existing in the old organization to achieve the best results. But with a rule by fear prevailing it will be interesting to discover of whom the bankers will stand in dread. It is reasonably certain, at any rate, that if someone or something will put the fear of God and fear of the law into their hearts that many things which occurred in the old company will be avoided, and that the way of the new organization will be made much easier and very much more satisfactory to all those with whom it may deal.

At least some of the bankers responsible for the previous conditions are identified with the reorganized company. It is known that they took a very intimate interest in the affairs of the old corporation and that very much of this interest centered in the nature of the reports which from time to time were put into print and that served briefly to affect the value of United States Motor shares.

Motor World does not share the belief expressed in at least one other public print, that the methods which prevailed were the methods of "second-story burglars," but it is perfectly apparent nevertheless that the men of Wall street are not vitally concerned with the actual manufacture and sale of automobiles. Their business is selling paper—that is, securities—at a profit, and it is equally clear that not all of them are particularly scrupulous how that end is attained.

With its enormous paper capitalization—$42,500,000—it was a common remark that the United States Motor Co. was practically waterlogged. Perhaps it is not water that some persons believe they discern in the $37,000,000 capitalization of the reorganized company—which has fewer physical assets than the old one and which is not in the strict sense a going concern—but if what looks like water is not water the bankers can perform a public service by pointing out just what it is. It is obvious to anyone that if men pay $24 or $25 per share for the stock of an embarrassed company and by reorganizing it are able by one means or another to increase its market value even 10 points, the profit that accrues is handsome enough to satisfy at least some of the less grasping followers of "the street."

Although some of them may be so blind that they will not see it is reasonably clear that the painting of "blue sky" and "rainbows" for speculative purposes will not long remain what it is, nor what it was. If it has served no other purpose, the congressional so-called "money trust" investigation let in a flood of light on the pastime or business of million-manufacture. As a result, it now is much plainer how it is possible for underwriters with the assistance of a chain of banks to float hundreds of millions worth of securities at substantially no cost and no outlay to themselves. The paper is passed on and on and paid for by the ultimate purchasers before the ships are really floated.

It may be argued that the internal affairs of be-millioned corporations—such, for instance, as the United States Motor Co.—are not properly a subject for comment by trade publications, such as Motor World. When, however, such corporations offer millions of their shares to the public, and utilize the automobile industry as a means of exploiting them—when this comes to pass, Motor World believes that such corporations cease to be private companies and become of both trade and public concern. Their affairs are of the trade and belong to the trade, and to us it seems that a trade publication which is not of the back-scratching sort can perform no greater service to the industry to whose welfare it is committed than by pointing out the evil, not merely in corporations but in the men who may comprise them.

The automobile industry has been over-exploited. It is feeling its effects. It is time to check reckless exaggeration and reckless extravagance. "Blue sky" and get-rich-quick methods no longer should be suffered to obtain. Motor World stands committed to this policy, and threats, foul-mouthed or otherwise, will not dissuade us from turning on the light whenever and wherever light will serve good purposes. We believe men who supply 100 cents' worth of goods and who expect 100 cents in return, not a compromise of 25 cents or 50 cents after the damage is done, will stand with us, as will the dealers whose interests also suffer from such blights.



January 11-17, Milwaukee, Wis.—Annual Show of the Milwaukee Automobile Show Co. and the Milwaukee Progressive Automobile Dealers' Association in the Auditorium.

January 11-18, New York, N. Y.—Automobile Board of Trade's 13th annual show in Madison Square Garden and Grand Central Palace. Pleasure cars only.

January 16, 17, 18, New York, N. Y.—Midwinter meeting of the Society of Automobile Engineers, in Hotel McAlpin.

January 17, New York, N. Y.—Annual Dinner of the Society of Automobile Engineers, in the Hotel McAlpin, 8 P. M.

January 20-25, Philadelphia, Pa.—Philadelphia Automobile Trade Association's exhibit in the First and Third Regiment Armories.

January 20-25, New York, N. Y.—Automobile Board of Trade's 13th annual show in Madison Square Garden and Grand Central Palace. Commercial vehicles only.

January 21-26, Toledo, Ohio—Annual show in the Exposition building under the auspices of the Toledo Automobile Shows Co.

January 25-February 1, Providence, R. I.—Annual show of the Rhode Island Automobile Dealers' Association in the Providence State Armory.

January 27-February 1, Ottawa, Can.—Annual show of the Ottawa Valley Motor Car Association in Howick Hall.

January 27-February 1, Scranton, Pa.—Third annual show of the Scranton Automobile Dealers' Association in the 13th Regiment Armory.

January 27-February 1, Detroit, Mich.—Detroit Automobile Dealers' Association's Show in the State Armory.

February 1-8, Chicago, Ill.—National Association of Automobile Manufacturers' 12th annual show in the Coliseum and 1st Regiment Armory. Pleasure cars only.

February 3-8, Washington, D. C.—Washington Automobile Show Co.'s exhibit in Convention Hall.

February 8-15, St. John, N. B.—First annual show of the New Brunswick Automobile Association in the Drill Hall.

February 8-15, Youngstown, Ohio—Annual show of the Youngstown Automobile Show Co. in the Auditorium and Annex.

February 8-15, Hartford, Conn.—Sixth annual show of the Hartford Automobile Dealers' Association in the State Armory.

February 10-15, Minneapolis, Minn.—Minneapolis Automobile Show Co.'s show in the National Guard Armory.

February 10-15, Chicago, Ill.—National Association of Automobile Manufacturers' 12th annual show in the Coliseum and 1st Regiment Armory. Commercial vehicles only.

February 12-15, Geneva, N. Y.—Annual show in the State Armory, under the auspices of the Ottawa Valley Motor Car Association.

February 15-22, Albany, N. Y.—Annual show of the Albany Automobile Dealers' Association in the State Armory.

February 15-22, Newark, N. J.—New Jersey Exhibition Co.'s Sixth annual exhibit in the First Regiment Armory.

February 16-23, Richmond, Va.—Richmond Automobile Dealers' Shows Co.'s exhibit in the Horse Show building.

February 17-27, Kansas City, Mo.—Kansas City Automobile Dealers' Association's show in Convention Hall. First week pleasure cars; second week commercial vehicles.

February 19-22, Davenport, Ia.—Annual show of the Tri-City Automobile Dealers' Association in the Coliseum.

February 19-22, Oshkosh, Wis.—Oshkosh Automobile Dealers' Association's second annual show in Armory B.

February 20-22, Canandaigua, N. Y.—Motor Car show in Hawley's Garage, under the management of A. Blumenstein.

February 22-March 1, Brooklyn, N. Y.—Brooklyn Motor Dealers' Association's third annual show in the 23rd Regiment Armory.

February 24-March 1, Omaha, Neb.—Omaha Autmobile Dealers' Association's annual show.

February 24-March 1, Cincinnati, Ohio—Third annual show of the Cincinnati Automobile Dealers' Association in the Cincinnati Music Hall.

February 25-28, Topeka, Kan.—First annual show of the Kansas Motor Show Co.

February 26-March 1, Fort Dodge, Ia.—Second Annual show of the Fort Dodge Dealers' Association in Armory.

January 27-February 1, Rochester, N. Y.—Fifth annual show of the Rochester Automobile Dealers' Association in Exposition Park.

March 1-8, Paterson, N. J.—Second annual show of the Paterson Automobile Dealers' Association.

March 3-8, Pittsburgh, Pa.—Pittsburgh Automobile Dealers' Association's show in Duquesne Garden.

March 3-15, Des Moines, Ia.—Des Moines Automobile Dealers' Association's fourth annual show in the Coliseum. First week pleasure cars; second week trucks.

March 10-15, Dallas, Tex.—Annual show of the Dallas Automobile Dealers' Association in the Fair Grounds Coliseum.

March 20-24, New Orleans, La.—Annual show of the New Orleans Automobile Dealers' Association.

Disagreeing Partners Ask Receiver.

Pending the dissolution of a partnership between William S. Rice, Thomas Hardy and Joseph Dunston, a receiver, upon application of Rice, was appointed last week for the Reliable Garage & Automobile Co., at 27 Orange road, Montclair, N. J. Rice alleges that Hardy leased a garage operated by the Reliable company to others, thereby virtually abandoning the business. A chattel mortgage figures in the case.

Newtone Makers Produce a $4 Horn.

Without intimation that anything of the sort was in contemplation, the Automobile Supply Mfg. Co. of Brooklyn, N. Y., which manufactures the Newtone motor driven horn, has placed on the market a vibrator horn, styled the Electra, which lists at the remarkably low price of $4. It is claimed that it operates on less current consumption than any other horn on the market—that is, one-half ampere.

Tire Exports Continue to Gain.

Shipments of tires from the United States during November, 1912, to the value of $275,360 marked a gain of $98,150, or 35 per cent., over $177,210, the value of the tires shipped abroad during the same month of 1911; for the first 11 months of 1911 the value was $2,257,727 and for the same period of 1912, $3,034,699, a gain of 34 per cent., slightly less than the November, 1912 increase.

Remy Discontinues Indianapolis Branch.

Owing to the proximity of Anderson to Indianapolis, the Remy Electric Co. has discontinued its branch in the latter city and will care for its former patrons through the factory in Anderson, Ind. E. M. Jones, manager of the Indianapolis branch for the past two years, has been transferred to the home office, but he will cover his former territory.

Firestone Opens Two More Branches.

The Firestone Tire & Rubber Co. has opened branches in Milwaukee, Wis., and Memphis, Tenn. The former will be in charge of J. E. McGinnis, heretofore identified with the Firestone factory, while William Clark Waters, formerly with the Firestone branch in Indianapolis, will manage the Memphis establishment.

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COL. POPE AGAIN LIONIZED AT M. A. M. ANNUAL BANQUET

Distinguished Veteran Arouses Enthusiasm of the Diners — Detective Burns One of the Speakers— Urges Civic Decency.

Colonel George Pope, chairman of the Board of Trade's Show Committee, was again the "lion" at the Motor and Accessory Manufacturers' annual banquet which occurred in the Waldorf-Astoria last night, 15th inst. As was the case last year, when the "good, gray Colonel," who was a guest of the occasion, arose to speak he was cheered and cheered and cheered again. When he concluded his remarks, there were more cheers, which finally merged into the singing of "He's a Jolly Good Fellow."

The banquet befitted its sponsors and was in keeping with the character of its predecessors. Everything connected with it was exceptionally well arranged and of a high order, which characterization applies even to the cabaret show with which the 450 diners, seated at 57 tables, were entertained from the moment they entered the hall until the speechmaking began. And there was not too much of the speech-making. In all, there were but four addresses delivered, respectively, by George McAneny, president of the Borough of Manhattan, who substituted for Job E. Hedges; by W. J. Burns, the famous detective; by T. O. McGill, a former president of the once noted "Amen Corner," and by Colonel Pope.

The post-prandial exercises were opened by an introduction by H. T. Dunn, president of the Motor and Accessory Manufacturers, who turned them over to Howard E. Raymond, a past president, who was programmed as toastmaster, but who, with a few words, transferred the gavel to Wilbur D. Nesbitt.

The only thing that served to mar the occasion was the undue noise which prevailed. There were those who were so overflowing with good spirits that they could not contain themselves. While Mr. McGill was speaking, the noise became so loud that he abruptly terminated a witty address on the subject of "Parts" and left the room, which caused Mr. Raymond to arise and rebuke the noise-makers in short but emphatic language.

President McAneny was the first speaker. He dwelt on some of the problems facing the government of the City of New York, including the work of road and street improvement, and leading up to it he, in humorous fashion, briefly observed that originally the Island of Manhattan had been sold for $24 to Peter Minuit by the Indians while they were in a drunken stupor, and he added with a smile that it probably had given to Manhattan the meaning "a place of general intoxication," which was attached to it by the Indians when they realized the folly of their bargain.

Detective Burns delivered a characteristic talk on the value of organization and its relation to industry in general, and made the most of the occasion to awaken those present to sense of civic decency. He referred to the awakening of the public conscience, as indicated by the echoes from all over the country of the convictions of lawless elements, and said that, in his opinion, the American people of today owe their greatest thanks to the passing of the period when this lawless element "can take human life and get away with it." He declared that such men as those represented by the Motor and Accessory Manufacturers should interest themselves energetically in public questions and personally see that unfit characters are not permitted to assume public office.

Then came Colonel Pope and the cheers. When they subsided, he remarked that to him the banquet appeared more like a social gathering than a formal function for business men, for he had met so many of those present and done business with them for so many years that he looked upon them as social acquaintances. He facetiously remarked that he would not tell how many years he had done business with some of them, not that he was ashamed to tell how old he was, but for fear he might hurt the feelings of some of the apparently younger men if he exposed their ages.

In a chatty, informal way, the Colonel reviewed experiences with some of these men and remarked that such organizations as the M. A. M. are necessary because of the great value growing out of the personal association of man with his kin. In his most serious vein, Colonel Pope stated that while in such organizations it sometimes may seem that a particular member, or group of members, may be discriminated against, it is necessary for all of them to look at the broad fact that the rule of the greatest good for the greatest number must always obtain.

In addition to Messrs. Dunn, Raymond, Nesbitt, McAneny, Burns, McGill and Pope, those seated at the guests' table, or directors' table, as it was termed, were the following directors of the M. A. M.: J. H. Foster, C. F. Whitney, F. C. Billings, H. W. Chapin, L. M. Wainwright, D. J. Post, Charles T. Bryne, E. S. Fretz, William H. Crosby and Thomas J. Wetzel; and also these guests who did not speak: Samuel A. Miles, Merle L. Downs, A. G. Bachelder, H. A. Bonnell, James S. Marvin, Sidney B. Meyers and T. E. A. Barthel.

HOOSIER "BOOSTERS" MAKE REVELRY AT CONEY ISLAND

Part of Program of Placing Indiana Larger on the Map—Dinner of Big Village Boosters Tinged with Frost.

Although Coney Island, which, as all New Yorkers and some who are not New Yorkers, know, is not quite as Coney Island-ish now as it is when summer breezes blow, it is a plentifully joyous place when a crowd of joyous souls get together with no other thought than to have a good time. At least, the Hoosiers who are in New York's "midst" from far-away Indiana think so, and they ought to know, for they were down there on Saturday night last in force, the occasion of the visit being a dinner and entertainment that is only one of the many social functions which are ushered in each year with the National shows and which serve to relieve the tedium and monotony of business.

The Hoosiers, including a number of the more prominent men whose names are a power in the Indiana automobile industry, are in New York for a three-fold purpose, and they came in a special train. They are in New York to see the show, to put Indiana on the map—as is attested by the full-page "Boost Indiana" advertisements that have appeared in most Metropolitan journals; and they are in New York to have a good time.

Last Saturday night, however, they just let business go hang, and from four o'clock until midnight they inhaled whatever salt sea air filtered in through the tobacco smoke in Henderson's restaurant at Coney Island, and later at Stauch's, and altogether they had quite a gay time. As early as 10 o'clock in the morning, a stream of automobiles carrying happy Hoosiers headed toward Brooklyn, and when by four o'clock the number assembled had reached close to 200, caps and aprons were dealt out and the assault on the sea food was commenced. For upward of four hours the battle waged, when the retreat was sounded and the crowd undertook a forced march around the corner to Stauch's, where a private ballroom had been requisitioned and where the cabaret show was continued. Homer McKee, of the Cole cohorts, was the master of ceremonies at the dinner and contributed a humorous menu as well. John Guy Monihan of the Premier forces in Indianapolis was the "boss," however, the whole entertainment having been arranged for the Hoosiers by Captain Stratton of the Colt-Stratton Co. of New York and C. J. Maxson, the Brooklyn Premier representative.

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Another social function that had been looked forward to with pleasant anticipation for some little time, though events as they transpired proved that it came very far from realizing the ambitions of those who had it in hand, was held on Tuesday night at the Murray Hill Lyceum. It was the Big Village Motor Boosters' beefsteak dinner, and though it had been widely advertised by word of mouth and through the columns of the daily papers, not even the presence of such distinguished pioneers of the industry as Charles E. Duryea, Elwood Haynes, Colonel George Pope, Lewis Clark and George H. Brown, who were the guests of honor of the local tradesmen, could make of it the success that was forecast. In fact, some of the chief "Boosters" became "knockers" whenever the subject was mentioned.

Strictly speaking, the affair was decidedly frosty. The "entertainment contractor" had on hand all the properties, including the "actors," for a typical Bowery "amateur night." The Bowery flavor was not as well disguised as it might have been, however, and, as a result, the characters became targets for more than verbal slings.

Nor was the food any better than the cabaret. Tickets were $5 apiece, and there were aprons and caps in abundance, but the beefsteak was too small and so scarce as to suggest that the caterer had looked out for himself. There was beer to go with what little beefsteak there was, of course, and there were cocktails distributed in Monogram oil bottle, though not everyone knew what they were, and suspecting the kind of trickery that sometimes is disguised as practical joking, looked at them askance and left them. Also there were Haynes cigars that were not disguised, and consequently were smoked, and a number of accessory dealers provided a variety of souvenirs.

Among the other social functions of the season, the Goodyear Tire & Rubber Co. held a "show" dinner at the Astor on Tuesday night, and to-night (Thursday) the Stutz Motor Car Co. is to hold a dinner at the Waldorf. On Friday night the American-Marion Sales Co. will banquet its followers at George Rector's.

Mott to Manufacture Wire Wheels.

The Mott Wheel Works of Utica, N. Y., which heretofore has confined its operations to the production of wood wheels and rims, has entered the wire wheel trade with a radially laced product. The detaching mechanism is simple in the extreme and comprises a latch which is released by the simple pressing of a push button placed in the center of the hub. Even simpler is the replacement operation, for the wheel is simply slipped in place where it locks automatically.

A. A. A. MAY REVIVE TRUCK RELIABILITY CONTEST

Also Takes Steps to Resuscitate Tour for Glidden Trophy—Seven Clubs Admitted and Hopper Is "Watched."

Calling up visions of the Chicago-promoted and abandoned commercial vehicle contest mooted about this time last year and having either New York or Chicago as a terminus, the subject of a National reliability run for commercial vehicles again has been broached, and this time it is in a fair way to receive a great deal more consideration than it ever received before. The subject was one of many, and probably the most important of any, that engaged the attention of members of the American Automobile Association in annual session foregathered at the Hotel Belmont in New York City on Monday, 13th inst. In the absence of President Laurens Enos and First Vice-President J. A. Wilson, Second Vice-President Dr. H. M. Howe, of Maryland, presided.

Although the desirability of a national reliability contest for commercial vehicles was discussed at considerable length, practically no decision was reached, the only action taken being the formal adoption of a resolution empowering the president to appoint a committee to inquire into the proposal. The resolution is as follows:

"Whereas, The great increase in the use of commercial motor vehicles during the past year has been such as to raise the question of the need of a national motor truck reliability tour; therefore be it

"Resolved, That the president is hereby authorized to consult with the N. A. A. M. as to the value of such an event, and if a sufficient support in the form of a representative entry list is forthcoming the president is further empowered to appoint a committee and otherwise arrange for such an event during the coming summer."

The president also was empowered to arrange for the almost annual national reliability tour for the A. A. A., Glidden and Anderson trophies, which suggests that the fiasco of this year has not wholly disheartened the A. A. A.

Subsequent to the transaction of the routine business of the meeting, which included the addition of seven clubs to the list of members—two each from Iowa, Kansas and Oregon and one from Montana—bringing the total membership list up to 457, and the installation of N. H. Van Sicklen of Illinois as a member of the Executive Board, ex-President Robert P. Hooper was presented with a gold watch and a special A. A. A. fob in recognition of his services.

An invitation extended by President Powell Evans of the Automobile Club of Philadelphia, asking that the A. A. A. hold its semi-annual meeting in the recently finished new headqaurters of the Philadelphia club, was unanimously accepted; dates will be decided upon at the next meeting of the Executive Board.

More Activity of Weed Interests.

Another one of those moves which recently have been a part of activity in the Weed chain interests was made this week when the chain business of the Cleveland Wire Goods Co., of Cleveland, O., was taken over by the American Chain Co., the recently formed corporation which is identified with the Weed Chain Tire Grip Co. The transfer was made because of the necessity that the American Chain Co. acquire additional factory space for the manufacture of side chains. This part of the Weed chain has constituted about 50 per cent. of the Cleveland company's business for some time, and although the fact has not been advertised widely, the latter concern has been closely allied with the Weed industries.

To Triple Hydraulic Steel's Capital.

Preliminary steps have been taken by the Hydraulic Pressed Steel Co. of Cleveland, O., maker of automobile frames, among other things, to increase its capital stock from $400,000 to $1,200,000, of which $1,000,000 is to be represented by common and $200,000 by 7 per cent. preferred shares. When the increase is authorized by the stockholders, it is the intention to declare a stock dividend of 100 per cent.

New York Office for Champion Plugs.

Better to care for its Eastern trade, the Champion Spark Plug Co. of Toledo, O., has opened a New York office in the United States Rubber Building at 1790 Broadway. It will be in charge of F. B. Caswell, sales manager of the company, who will divide his time between Toledo and New York.

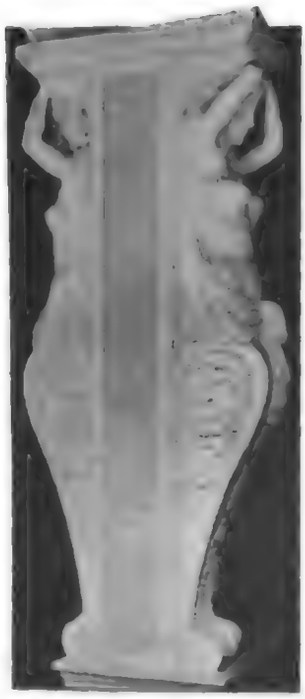
Receiver Sets Date for Penn's Auction.

The assets of the Penn Motor Car Co. of New Castle, Pa., will be offered for sale by the receiver on Tuesday, January 21st. The property includes real estate, a concrete factory building, machinery and a considerable quantity of automobile parts.

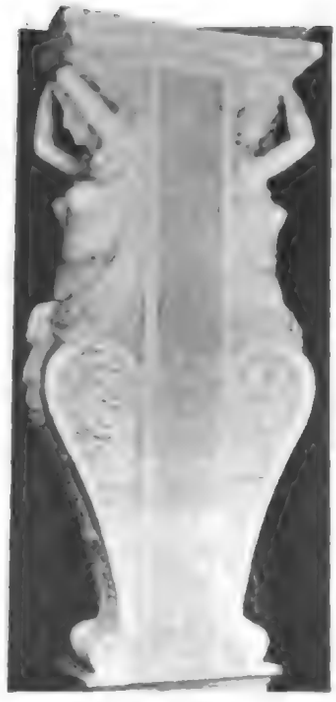
Mills Sails on Globe-Girdling Jaunt.

David B. Mills, president of the Ralah Auto-Supply Co., of Bloomfield, N. J., and Mrs. Mills, who have been spending some time in California, sailed on Monday, 6th inst., for a trip around the world. They will return about June 1st next.

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NEW YORK SHOW BEARS OUT ITS PROMISE



Emphasizes That This Is "The Year of Greater Values," as Indicated by Motor World—Also There Is More Show for the Money Than Ever Before—Twin Exhibition, in Handsome Dress, Bristles with Evidence of Trade Progress—Painstaking Search Discloses Surprising Novelty in Both Cars and Accessories.

One show in two buildings for even half of two weeks is just about as much of automobile shows as any reasonable being is likely to want within the course of a twelvemonth, at least, such shows as now are being housed in Madison Square Garden and Grand Central Palace in New York. No one who pays the admission fee can claim that he does not get more than his money's worth.

It is "a year of greater value" not only in respect to the cars themselves but from the standpoint of the mere show-goer as well. In other years there have been rival shows in progress in the same buildings at the same time, but never before under the same auspices and seeable for a single admission fee. Chicago for several years has staged its automobile exhibition in two adjoining buildings, but in New York the Garden and the Palace are more than a mile apart, and there are four flights of stairs to climb in order to see all that is to be seen in the Garden and three upward flights in the Palace. Chicago has but one flight to ascend, and while its display usually exceeds New York in point of car exhibits, for some inexplicable reason the display of accessories, while imposing, is thrown into the shadow by the truly formidable array outspread in New York.

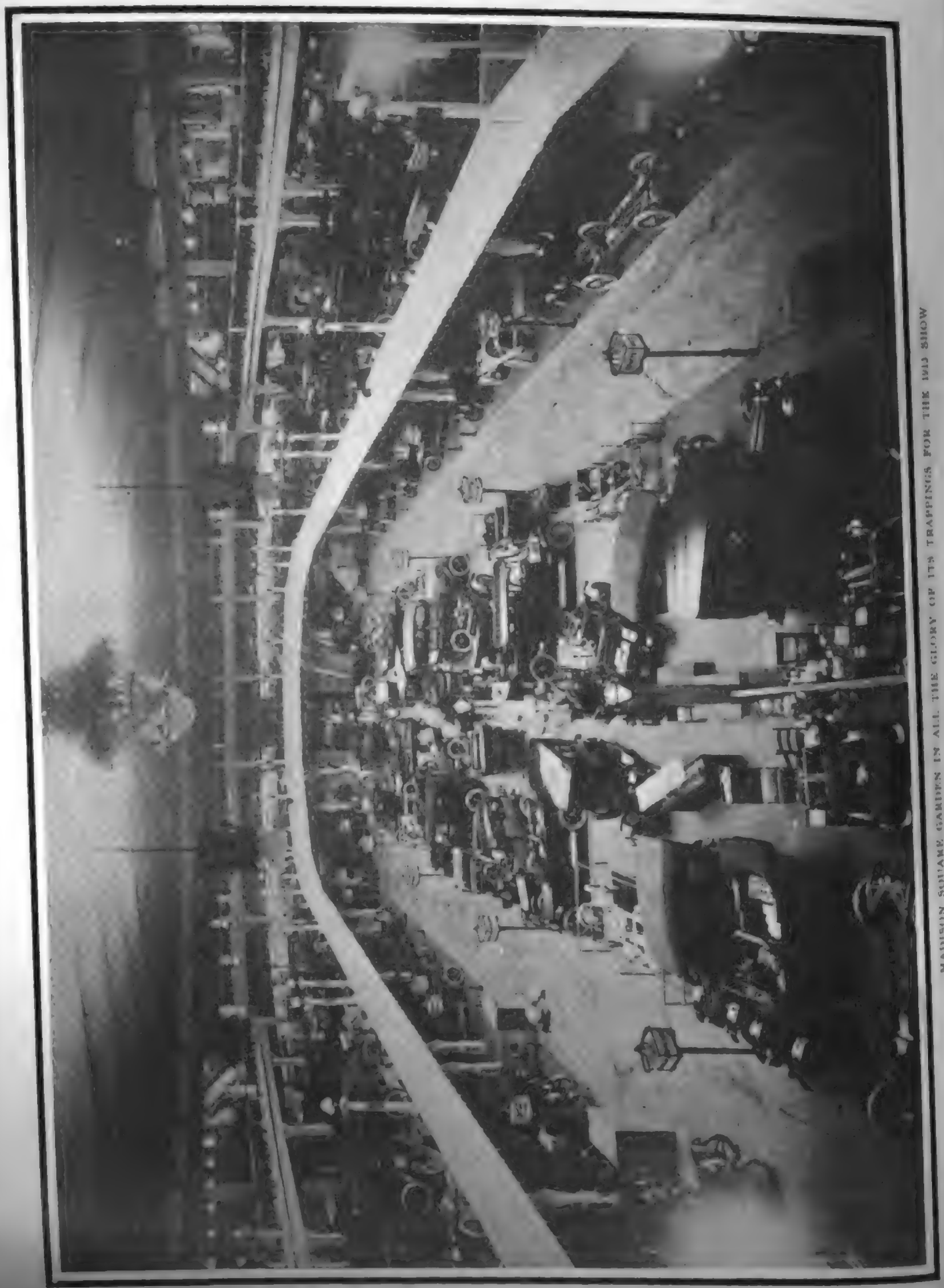
Most of the dealers and other tradespeople who visit shows consider the accessories worth seeing, but the average show-goer, who is overwhelmingly in the majority, rarely looks beyond the car. Not more than 50 per cent. of the attendance at the New York show descends to the basement or climbs more than two flights of the stairs, and—take it from those who have tried it—making the rounds of two immense buildings, a mile apart, and climbing seven flights of stairs while doing so does not constitute a round of wholly unmixed pleasure, at any rate, not if it is attempted within the span of a single evening. The New York show-goer of 1913 who tries it obtains all that his admission ticket entitles him to and cannot fail to return to his home a much-wearied individual.

If anything, the "climb to the skies" has been more popular this year than for several seasons past, and the reason is not far to seek. The snare of the souvenir has lured upwards many who otherwise would have been content to remain on the lower strata: for, strangely enough, and as if through the medium of telepathy, not a few exhibitors came to the show provided with more or less enticing souvenirs. The snare has not attained the proportion of the craze which several years ago caused the show management to forbid the distribution of



FOUNTAIN THAT GREETS THE EYE AT THE ENTRANCE TO THE GARDEN ARENA

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MADISON SQUARE GARDEN IN ALL THE GLORY OF ITS TRAPPINGS FOR THE 1913 SHOW

advertising gewgaws, but they are sufficiently numerous as to be distinctly observable, and the small boy, and the boy who is not so small, to say nothing of womankind, have not been slow to follow the scent.

Without well-defined meaning, it is customary to refer to such things as "brave shows," and, whatever it means, it may be said that the twin display in New York is as brave as any show that ever held the boards. There is more of it, and in either building it is handsome to look upon. As always, the immense arena, with its overhanging balconies, permits of Madison Square Garden being "dressed" as few other buildings can be "dressed"; it permits of a picture which fills the whole eye. In the Palace, half a dozen eyes are necessary, for that magnificent structure is so laid out that not all of it can be seen at a glance.

The decorators, or whoever is responsible for that sort of thing, dubbed the Garden a Crystal Palace, but if the truth be told it requires a stretch of the imagination to distinguish anything of the sort. Rather does it appear a great white show. From the more or less fleecy sky there depends three magnificent crystal chandeliers, overflowing with crimson flowers and other plants, which are flanked on either side by a series of much smaller chandeliers of the same crystal effect, and there is a wide expanse of mirror set into the walls on either side of the main floor; but the mirrors are thrown into a shadow by the wide overhanging gallery and the cars themselves half hide them. As a result, the crystal effect and the spaciousness which it was assumed the mirrors would lend to the Garden are not nearly so pronounced as fancy had pictured. For all of that the Garden does seem more spacious, but it comes not of the mirrors but of the little-remarked fact that one of the elevated platforms of previous years has been dispensed with.

The fountain, without which no Garden show would be complete, as usual greets the show-goer immediately he sets foot inside the arena. It is rather a modest fountain, compared with the fountains of yesteryears; it lacks the over-topping statuary which hitherto has been the rule, but the water is real, and so are the water lilies which float on its surface.

The center of the arena is bisected by a low, white fence, from which at stated intervals are upreared white columns capped by trailing greenery and crimson flowers, and from which are suspended on either side amber colored lamps. They are at once simple and eye-pleasing and, as does the green carpetry and the green sign posts bearing each exhibitor's name, they serve to relieve the general whiteness of the decorative scheme.

In the sides of the building, which are overhung by the elevated platform, huge mirrors have been set in a background of green, the elevated platform itself being upheld by allegorical female figures which form a partial arch over each exhibit and the severity of which is relieved by a touch of white lattice work. The elevated platform has a false front of white slightly relieved by a pink tint and is illuminated by columns topped by three white globes. The rail of the upper balcony is beautified by weavings of crimson ramblers, but the signs and the background of the galleries are reminiscent of other years; the same green and red wall paper being utilized to conceal the bare walls. That form and color of wall covering, with bunting employed to cover the roof, also is made use of in that beehive of noise and industry located in the basement.

Grand Central Palace, as so often has been remarked on previous occasions, does not readily lend itself to the decorative hand and, employing an almost equally stereotyped observation, its magnificence is such that it scarcely requires embellishment, but for all of that the present show indicates that even painting the lily can be successfully performed, for imposing though



LOOKING FROM THE LOBBY OF MADISON SQUARE GARDEN INTO THE ARENA

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GENERAL VIEW OF CENTRAL COURT IN GRAND CENTRAL PALACE WHICH AFFORDS GOOD IDEA OF DECORATIVE SCHEME

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it may be in unadorned grandeur, the Palace, with its great marble columns, has been rendered a far more pleasing picture. Green trellis work has been deftly arranged at the base of the great marble columns and between them, also on the smaller uprights, in the corners and on the walls, a glow of warmth being given to the whole by flaming red poinsettas interwoven in the trellis work, while in the wide panellings of the naked walls have been arranged landscapes and waterscapes which simply compel admiration. In other years, trellis work and wall paintings were laid with stinted hand, but on the present occasion there was no stint, and the result is charming to all who have eyes to see it. The walls of each floor are hung with a succession of painted reproductions of many of America's beauty spots, in the East, in the West and in the Southland. Viewed from a distance, and with imagination awake, it appears almost as if one is looking out from the Palace on the Palisades of the Hudson, the rugged heights of the Rockies, the plains of the West or moss-grown vistas in the sunny South. Most of the pictures were painted from photographs, and in the majority of them the motor car lends a touch of life.

At the very end of the main aisle of the main floor of the Palace is an old friend that bears witness that the Automobile Board of Trade had to do with the decoration of both buildings. It is the white statue typifying the "Spirit of the Motor Era," or the "Infant Industry," which last year overlooked the fountain in Madison Square Garden—the statue of a chubby youngster holding a loft a motor car while standing astride a motor truck which rests on an anvil. He is now doing duty at what preliminary notices described as a Roman exedra, which word sent more than a few men to the dictionary only to discover that exedra is another word for "a dignified seat." In other words, the statue now looks down on a slightly ornamental bench.

After a fashion, Grand Central Palace may be termed, for the nonce, a Palace of Popular-Priced Cars, for most of the cars that come within the purse of the man of moderate means are staged there. On the other hand, most of the cars of higher price, and perhaps of greater size and power, are located in the Garden. There are exceptions in both instances, of course, but the general fact remains; and the term "popular priced cars" has been given new meaning by such sumptuous vehicles as the Studebaker "six" limousine at $2,500 or the Sedan at $2,050; they really must be seen to be appreciated. And with a Reo limousine at the almost incredible price of $1,600, a Paige-Detroit sedan seating four persons, at the same price, and Bergdoll limousines at $2,400 and $2,600, even the jaded well may ask, "What next?"

Despite a cold rain which fell Saturday night, when the doors were thrown open, both buildings soon were filled. The greater crowd was in the Garden, perhaps, or it may be that it merely seemed that the greater crowd was there because of the usual congestion on the main floor and elevated platforms, while in the Palace crowds are spread over a greater space and are not so easily observable at one glance.

However, the shows have lost none of their attractiveness from the public standpoint, and crowded houses have been the rule. While the crowds are wiser than the crowds of earlier years, those persons who, if wishes were motor cars, would become possessed of them remains in the majority.



NEAR TOP OF GRAND STAIRWAY IN GRAND CENTRAL PALACE AND A SUGGESTION OF EXHIBITS AND DECORATIONS BEYOND

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CENSUS OF THE NEW YORK SHOW

And How It Compares With the Statistics of 1912

	Garden and Palace† 1912		Garden and Palace 1913	
Total Exhibitors		543		
Exhibitors of Cars	129		424	
Exhibitors of Accessories	398		89	
Exhibitors of Motorcycles	16		320	
			15	
GASOLENE CARS				
One Cylinder	3			
Two Cylinders	1		0	
Two Cylinders (two-cycle)	2		0	
Four Cylinders	246		0	
Four Cylinders (two-cycle)	4		169	
Four Cylinders (sleeve valve)	6		0	
Six Cylinders	54		6	
Six Cylinders (sleeve valve)	1		86	
Six Cylinders (rotary valve)	0		4	
			1	
Total Gasolene Pleasure Cars		317		266
Touring Cars	185		162	
Roadsters	76		49	
Limousines	19		23	
Berlines	14		8	
Coupes*	15		19	
Phaetons	3		1	
Landaulets	2		0	
Raceabouts	3		2	
		317		266
Air Cooled Cars	4		4	
Water Cooled Cars	313		261	
		317		266
CHASSIS				
Four Cylinders	49½		27	
Six Cylinders	14		21	
Electric	6		1	
		69½		49
ELECTRIC CARS				
Coupes	16		7	
Runabouts	2		3	
Broughams	2		0	
		23		10
Special Exhibits—				
Racing Cars	3		1	
Glidden Trophy Winner	1		0	
		4		1
Grand Total all Cars and Chassis		410½		325

* Includes Sedans. † Under separate management.

There is so much that is purely mechanical that what they see to interest them remains an open question.

There are fewer highly polished or special "show" chassis than heretofore and fewer purely "show" cars, but, as always, there are a few of them that have been designed for the occasion and perhaps they best serve to fill the average eye.

Luxury in Special "Show" Cars.

By all odds, the showiest car on exhibition is a Locomobile limousine, the body of which is finished in two quiet tones of red and the interior upholstered in crimson tufted silk; the lamps within and without are of ornate design and finished in gold, as are all other metal trimmings. Usually reds are garish, but these Locomobile reds are so refined and richly blended that they radiate warmth rather than garishness.

A Peerless brougham of special design and equipment is another imposing creation. It follows the lines of the traveling carriage of a Colonial grandee of 200 years ago. Outwardly it is finished in yellow and black, while within it is upholstered in brown leather of velvet finish and is lighted by several dome lights of cut amber glass, so that even the prevailing illumination is of a subdued brown tone. Flower vases and carpetry are of the same amber hue. All of the interior fittings are gold plated, even to a clock which is provided with a tiny electric light and to the cigar lighter. Under the arm-rests which divide the rear seat is a cellarette, and there is also a table which may be swung into place on which to serve refreshments or to use as a reading table. Not so beautiful but almost as striking is another Peerless closed car, a limousine, with a gray metal body and with almost square lines which in these days appear uncommonly severe.

"Cabette" and Cabriolet Revealed.

What is styled a "cabette" but what really is a two-passenger brougham, constitutes the centerpiece of the Packard exhibit. It is striking chiefly because of its long "forefront" and small body, but in its lamps a clever conceit has been introduced for show purposes. The lenses of both headlights are of ground glass on which has been photographed in colors a Packard car in a landscape setting. As the electric lights are turned on at all times, the pictures stand out almost as if projected by small magic lanterns.

Of the several "show" cars, the one that screams loudest is the Premier cabriolet, styled the "Killarney Colleen." It is finished in what is termed Monihan green, which is of a brilliancy which cannot fail to suggest the "old sod." The green is relieved only by a painted belt of fire-alarm red and red rimmed wire wheels. The upholstery is done in imported English pigskin with bird's-eye maple trimmings; there also are silk plush carpetry and French golden curtains. The storage capacity of the car is also one of its features. Compartments are provided in no less than three different places.

In touring cars the only showiness is the result of Briggs-Detroiter effort. The car is finished in white with a gold belting and all of the fittings are gold plated. If it were not a regular model, the lines of the Pathfinder "cruiser" model would almost cause it to be singled out as a "show" car and the same is true of the little Hupmobile coupe with its almost circular body and odd looking "pancake" ventilator, and which suggests the individual equipage of a Far Eastern potentate. In its class, the Cole speedster has the most striking and most original body design in evidence. With its three seats abreast, and divided rear deck it presents an odd appearance not easily described.

"Action" Exhibits That Attract.

While the general use of electric starters has made it possible for almost every exhibitor to give at least temporary demonstrations of cars in "action," "action exhibits" are fewer than for several years, at least so far as cars are concerned. "Up aloft" or "down below" in the realm of accessories, makers of ignition apparatus, and bumpers, and shock-absorbers, and the producers of oil are able to demonstrate the "action" of their various devices. But com-

paratively few car makers are doing anything of the sort. At least three of them, however, are employing "action" to good advantage—Speedwell, with a cut-away engine which, illuminated from within, graphically shows the operation of the Mead rotary valve; the Cartercar, which shows its "gearless transmission" in operation, and the air-cooled Franklin, which employs a number of pinwheels which simply but effectually illustrate the direction of air currents.

It is in the basement, however, that the oddest and most picturesque "action" ever brought into an automobile show is to be seen. W. B. Laidlaw, Jr., is the man to whom the credit is due. He is utilizing live ducks and live fish to exploit the merits of the top material which he has for sale. He has filled two sections of it with water and the ducks and fishes are disporting in the improvised "ponds" which thus vividly prove the waterproofness of the Laidlaw material.

"Fine Points" Revealed by a Critical Study of the Cars Displayed

The mechanical aspect of the show, too, already has been told in Motor World's 400-page Before Shows Issue with a thoroughness and a minuteness never before attempted, and as a result, the show in the abstract, or the concrete, or anything else, is a little more than a vindication of the trends and tendencies and developments laid down in that issue; it is an emphasis of them that serves to bring into bolder relief the differences in detail that make for individuality without disturbing the structure that is built of common practice. Having perused Motor World's Before-Shows Issue, inspection of changes and improvements and those comparisons and "studies" are facilitated as never before.

Landaulet Bodies Among the Missing.

Of course, there are surprises; it was known that there would be "something sprung" in a number of instances, though not all the "surprises" materialized. And equally as a matter of course, there is much to attract those who hanker after something "just a little different"—and much of it is surprising in more than one respect.

In all the show, there are no landaulet bodies, which is so surprising as to be remarkable in view of the general increase in the popularity of closed cars of other types and the seeming favor with which the landaulet was viewed at the last show. That there are no steamers is not so surprising, for the steam car steadily has coasted down the hill that has popularity for its summit until at present it is so near to the bottom that it almost is out of sight. Similarly, there are no "one-lungers" and no "two-lungers," to carry the simile a little further, nor is the two cycle engine represented by a single adherent to that supposedly simple principle; it has just naturally flickered out almost unnoticed.

Franklin the Only Air-Cooled Car.

Chain driven cars are represented by a single exponent, unless the Cartercar, which is driven by a single "silent" chain, is considered, and that exponent is the little Metz roadster—the lowest priced car in the show. Strangely enough, both the Metz, which, as everyone knows, or ought to know, is driven by twin side chains, and the Cartercar are of the friction driven type, and these two cars are the only ones of their kind at the show. The only other place place where it is possible to speak generally



and use the word "only" is in reference to air-cooled cars. There is only one air-cooled car on the floors, and no one needs to be told that that one car is none other than the Franklin, which has held to air cooling from the first.

Incidentally, if there be those who are inclined to doubt the efficacy of the cooling draft of air to reach every little nook and cranny of the big Franklin motor, a demonstrating car which has been equipped with a celluloid paneled hood will serve as a liberal education. Altogether there are 25 or 30 small aluminum "pin-wheels" balanced all over the engine from the tops of the cylinders to the lowermost depths of the hood, and the way they spin as the flywheel of the engine is rotated under the persuasion of an electric motor leaves little room for doubt regarding the direction, or, rather, the many directions of the currents of cooling air.

Two Real Surprises Are Sprung.

Two of the few real surprises of the show that were kept so carefully muffled that not even an inkling of the imminence of their birth was permitted to escape are to be found at the Haynes booth, where there is a brand new "six" that was suspected by remarkably few, though the rest scarcely would have difficulty in recognizing it as a Haynes once they could glimpse its features and at the American stand, where, too, there is a new "six."

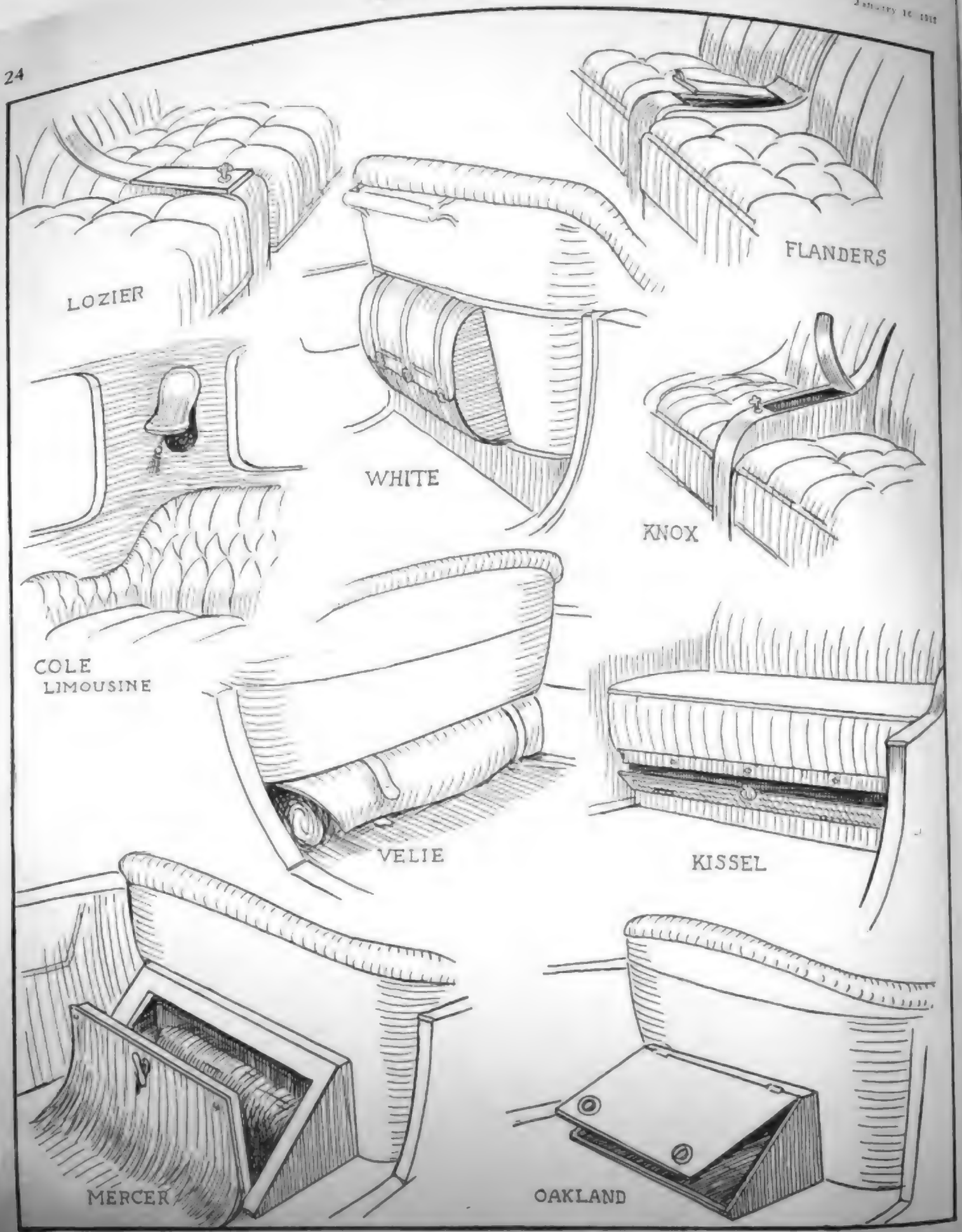
Externally, the Haynes is a roomy car finished in gray with nickel-plated trimmings and upholstered in finely striped gray whip cord. McCue wire wheels lend an added air of distinction, though they are far from exclusive with the Haynes. It is styled model 23 and, in common with the new four-cylinder Haynes, which also is making its inital appearance, it has an L-head motor with the cylinders cast in pairs and measuring 4¼ x 5½ inches. Both of them are electrically lighted and started and both sell for moderate prices—the "six" at $2,500 and the "four" at $1,785.

New Cars That Make Their Debut.

Of all the 88 brands of cars that were scheduled to appear, only two failed to put in an appearance, and as ever has been the case, several unlisted and unheralded exhibitors are "among those present"; they are the King, the Keeton and the Schacht. The two lines that are missing are the Warren and the Only, the former of which was due to uncover a brand new six-cylinder model and the latter a four-cylinder car utilizing a motor with a bore of 4¼ inches and a stroke of 7⅞ inches. Hence, there are 89 separate car exhibits staged in the two buildings—43 in the Garden and 46 in the Palace.

Naturally, the new "sixes"—and the new "fours," too—that have been brought out by old-line manufacturers attract more than do their predecessors, and at the booths where there are exhibited cars that are making their initial appearance there is a never-

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THE PROBLEM OF FINDING STORAGE SPACE IN TOURING CARS—NINE SOLUTIONS OF IT

ending stream of spectators to pay homage and inspect and criticize. Particularly are the new low-priced "sixes" the center of attention—the Little, Krit, Studebaker, Flanders, Herreshoff, Mitchell and Havers—and those that mount slightly higher up the price scale and list between $2,000 and $3,000 scarcely are less patronized; the list includes Chevrolet, Havers, Stutz, Oakland, Hudson, Cole, Mitchell, Imperial, Premier, Inter-State, Lenox, Garford and the two Speedwells, the Speedwell-Mead and the Speedwell poppet valve. Among the higher-priced "sixes" that are new there is the Norwalk, which is not now the only underslung "six," the Oldsmobile, Lozier, Packard, Knox, Stevens-Duryea, Stearns-Knight, and Marmon. All in all, there are no less than 31 brand new "sixes" in the list.

Apart from the fact that the motor of the American six-cylinder car has six cylinders, that the stroke is 6 inches and that the body is very slightly shortened up because of the longer motor hood, there is nothing in it that is not familiar in American underslung construction. The motor is of the T-head type, with a bore of 4½ inches, and is rated at 60 horsepower. The chassis is practically that of the "traveller," with a wheelbase of 140 inches and 39 x 5 inch tires front and rear on demountable rims, and carries a six-passenger touring body. A double unit electric starting and lighting system is included in regular equipment.

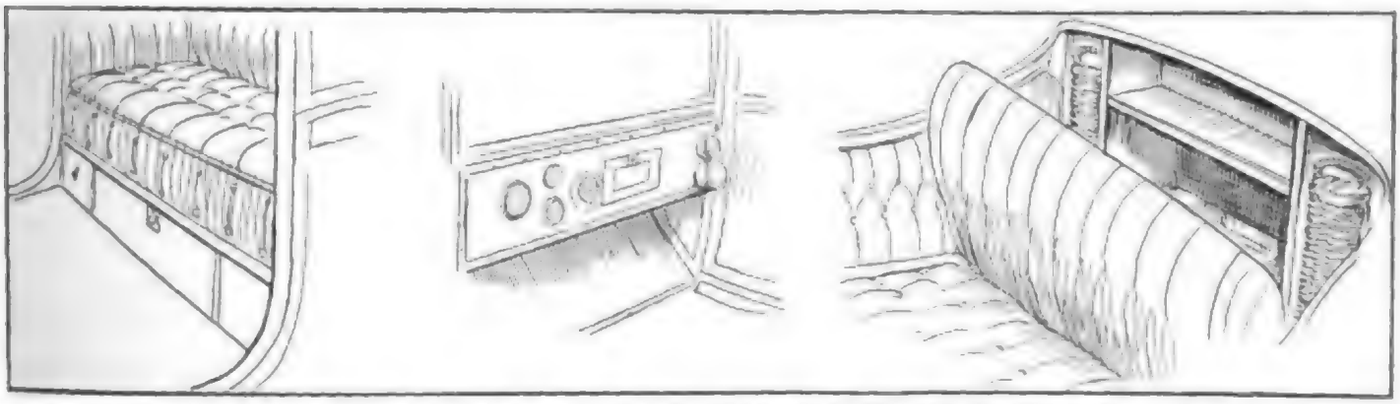
Among the new "fours" that make their first appearance there are six that sell for less than $1,000, the little Metz roadster being at the head, or the foot, of the list, as the case may be, with a selling price of $395, and the others, including the Little, Detroiter, Studebaker, another model Detroiter, and Empire, mounting each slightly higher in the price scale up to $950, which is the price of the Empire. Among the higher-priced "fours" that are new, the list is no less impressive and includes the Oakland, Maxwell, Paige-Detroit, Studebaker, Henderson and Mitchell, selling for between $1,000 and $1,500; the Michigan, Abbott-Detroit, Haynes and Bergdoll selling for between $1,500 and $2,000; and the Pope-Hartford, Edwards-Knight and the Fiat, selling for more than $2,000.

Considering all the new cars, none is a real surprise except the Haynes, of course, the American, and possibly the Krit "six," though even that car was forecast in Motor World's Before-Shows Issue. At that time, however, details of construction and price had not been definitely decided by the manufacturers. Actual inspection of the car reveals a little more car than might have been expected, judging merely by the estimated price, which, it is understood, is to be in the neighborhood of $1,300.

It is a big, roomy, five-passenger car with a 50-horsepower motor that is chiefly distinctive by reason of the fact that the cylinders are cast with the complete crankcase integral, the cylinder heads being detachable and in two sections, each section covering three cylinders. The bore and stroke are 3¼ and 5 inches, respectively. The engine is a unit with the multiple disk clutch and the three-speed gearset and supported at three points in the chassis frame; wheels are shod with 34 x 4 tires and the wheelbase is 120 inches. By way of providing for the accommodation of almost any size driver, the steering column is easily adjustable up and down and the pedals may be lengthened or shortened at the will of the driver. The steering wheel is placed at the left side with the control levers in the center.

The only other new car that might be considered somewhat in the light of a surprise is the "35-4" Maxwell, which is shown side by side with the Flanders cars and is so much like them that it requires the word of a salesman to distinguish between them. It has a four-cylinder motor, of course, and differs from the Flanders "sixes" (which soon are to be called Maxwell, too) in that respect. It sells completely equipped for $1,085, though there is nothing in its make-up to suggest the lowness of its price. Its motor, for instance, is of the same general type as the Flanders motors, with cylinders cast in a single block; dimensions are 4 x 4¾ and the transmission elements include cone clutch and three-speed selectively operated gearset located on the rear axle.

The roster of the older cars that are exhibited is very nearly complete, as may be judged by reference to the accompanying summary, which lists all the makes represented. With but very few exceptions, the names of the cars that have gone to make up the shows of the past are to be found on the signs that direct visitors in either the Garden or the Palace, with here and there a newcomer that adds spice to the list. The Edwards-Knight is one of these, and the Stearns-Knight "six" is another; the former already has been illustrated and fully described in a previous issue of Motor World, to say nothing of a resume of its principal features which appeared in the Before-Shows Issue; the Stearns-Knight also was reviewed in the Before-Shows Issue. For the delectation of those who would have word of mouth with the inventor of the Knight engine, no less a personage than Charles Y. Knight himself discourses daily on his engine at the space where the cars with the "white line on the radiator" are shown.

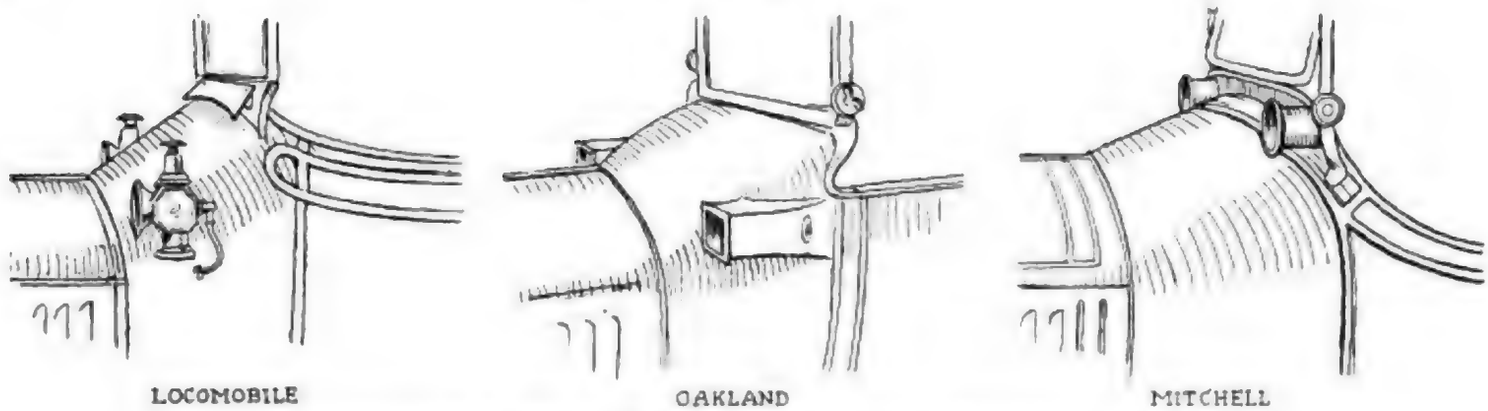


DIVERSITY OF STORAGE SPACE PROVIDED IN THE PREMIER "KILLARNEY COLLEEN" CABRIOLET

With the exception of the Knight engines, there is only one other type of non-poppet valve engine regularly fitted to a car at the show. The engine is the Mead, and though it, too, has been reviewed in the Before-Shows Issue of Motor World, there are many "fine points" in its construction which will be of benefit for closer inspection, a fact which is equally true of nearly all the other cars, new and old.

Though the Speedwell Mead engine conforms closely to the general design of the Mead motor which made its appearance for the first time at the summer convention of the S. A. E. two years ago, some changes have been made, as might have been expected, in building a "six"; the original

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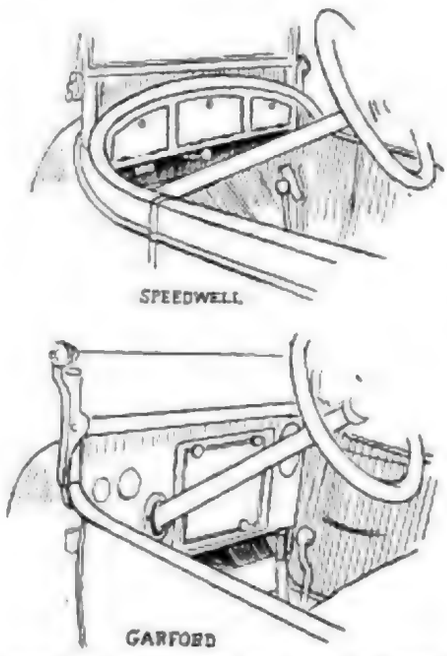
LOCOMOBILE OAKLAND MITCHELL

CONTRASTS IN SKUTTLES, SHOWING THREE METHODS OF MOUNTING LAMPS

motor was a "four." The valves, which constitute the principal feature of the motor, are long and cylindrical and are mounted in pockets which run the length of the cylinder casting near the top of the combustion chambers; they are slotted and register with ports in the cylinder walls, thus permitting the same functioning as do the poppet valves in a poppet valve motor. There are two of these cylindrical members, one serving for the intake and the other for the exhaust, or, to be more explicit, there are four in the six-cylinder Speedwell engine, it having been found advantageous to make each member in two parts and to join them with a coupling of the Oldham type in order to permit a flexible drive without back-lash or looseness. The unit type of construction is employed, and this, together with the outward form permitted by the peculiar valve system, results in an exceedingly clean, neat looking engine.

Methods of Mounting Starting Motors.

Speaking of unit construction, there is a neat example of the inclusion of a starting motor with a unit power plant in one of the chassis at the Palace—that of the Herreshoff—and the most conspicuous feature is the way in which the gearcase has been carried up to join the starter casing, which is superposed on the housing of the flywheel. The whole arrangement has the appearance of "belonging" together, which, in fact, it does, as the design was worked out for the purpose. The more usual method of mounting the starter motor is on a special bracket on the crankcase, as is done in the Abbott-Detroit, in which motor, however, the starter drive is unusual in that it employs a set



SPEEDWELL GARFORD

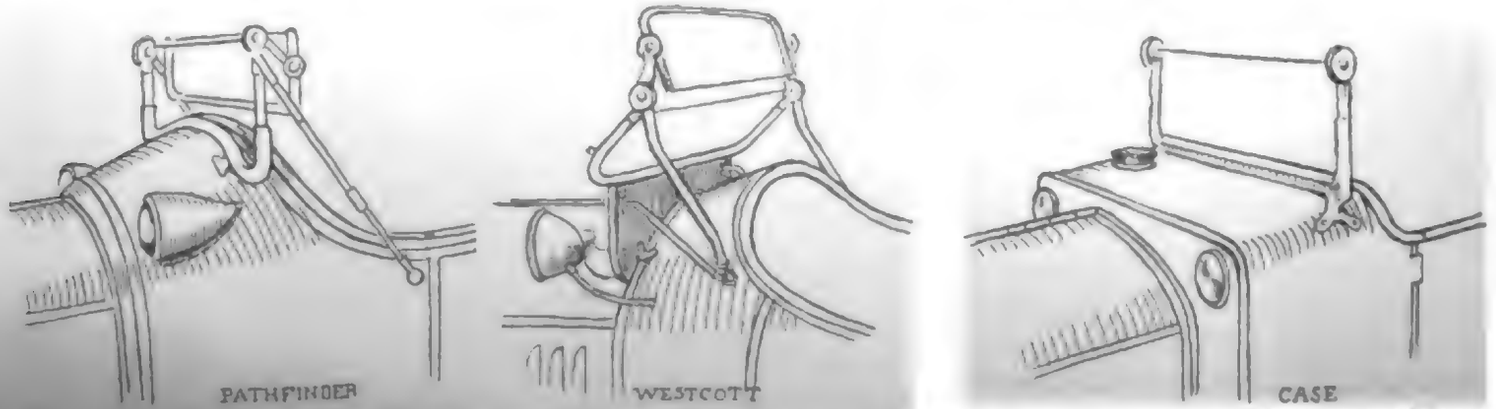
STORAGE PROVIDED BY COWLBOARDS

of gears all its own, though housed with the timing gears. By virtue of a ball-ratchet clutch arrangement, the extra gears are always idle, except when the motor is actually being started; and they do not move even when the motor is cranked by hand. The ball-ratchet is automatic in taking hold when the starting motor is switched on, so that no sliding gear or other engaging device is required.

Speedometer Driven from Gearset.

It is very apparent that speedometers no longer are considered luxuries; they form part of innumerable regular equipments, and one almost instinctively looks for the dial on the dashboard and glances around for it when it is not at once apparent. One of the cars that is equipped regularly with a speedometer has, however, a speedometer drive that is "different" and has obvious advantages; instead of the usual drive from one of the front wheels the motion is taken from the propeller shaft, a little casing being attached to the torque tube for the purpose. The flexible shaft is out of the way and the arrangement has an appearance of permanence and neatness that is refreshing. On the same car—the Edwards-Knight—the rear spring suspension, which is of the Lanchester type, is a conspicuous feature; one end of each semi-elliptic spring rests on the rear axle and the other is shackled to the frame, which also carries the bracket for the spring center. Extreme flexibility and easy riding are virtues credited, with good reason, to this suspension system.

There are all kinds of indications that bodily comfort is given serious consideration by builders of other cars, too. In



PATHFINDER WESTCOTT CASE

COMPARISON OF WINDSHIELD MOUNTINGS, SHOWING TENDENCY TOWARD SHORT STRUTS

one case—the Marion—the springs are imported from England for the reason that they were found to be of just the right degree of flexibility and of just the right temper for that particular car. The apparently sound theory that the up-and-down motion of a car with very short radius rods produces a slight but constant back-and-fourth movement that is tiring in a subtle and unappreciated way, is responsible for the long torque tube of the Marathon car; the springs are shackled at both ends and the vertical motion is so nearly straight that the "fore-'n-aft" motion is said to be eliminated, to all intents and purposes. Anyway, it is a pretty theory.

Bodily comfort is affected by other things than springs, however; and one of them is the amount of space that is available for the stowage of one's feet and legs in a car of the small kind. It is quite an object lesson to see a long-legged six-foot-and-more man get into a little Detroiter and loll back in the seat with his feet the full length of his legs ahead of him, and sit at the wheel without undue prominence of the knees—things made possible by the long body permitted by the arrangement of the platform rear springs.

That bigness is not necessarily synonymous with power or efficiency is rather peculiarly brought out in the design of some of the cooling fans. A few years ago it was orthodox to make the fan pretty nearly as big as the radiator; but now, in the Cole, for instance, the fan is a little three-bladed affair that looks positively insignificant behind the ample radiator. Its efficiency, however, is in its scientific proportion and pitch, and this is true also of the fan of the Edwards-Knight, a four-bladed aluminum casting with blades so narrow that they have caused more than one cigar to change hands as the result of their air-moving ability, as pronounced as it is unexpected, if a first impression is taken as a basis of judgment.

There are lots of things one is given an option on in buying a car—tires, wheels, rims, lighting systems, bodies, and so on—

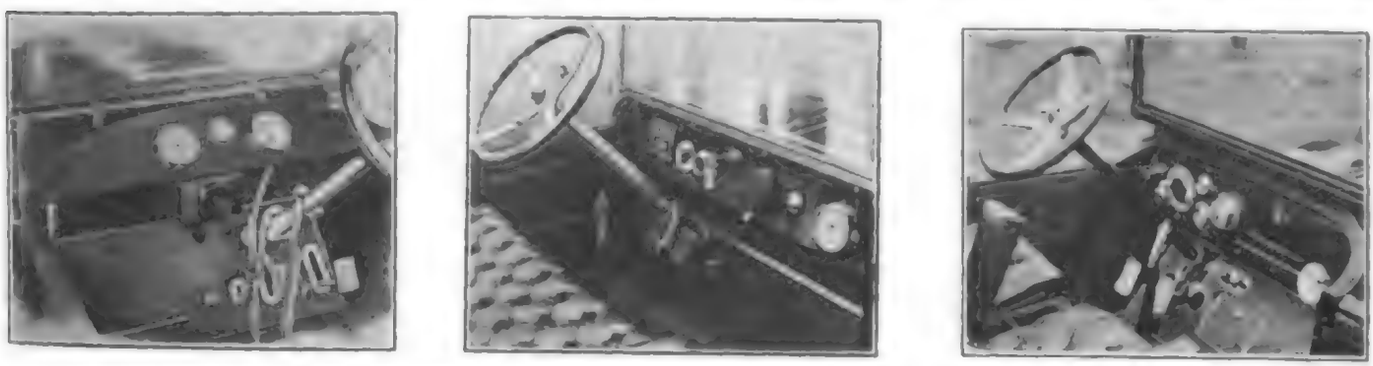


NATIONAL COWLBOARD

who sell the Little "six" give an option of the standard six-cylinder motor or a "four" of exactly the same horsepower built to fit into the same space. If the "four" doesn't suit, change over to a "six," or vice versa. Of course, the "six" costs a little more. The "four" is a brand new proposition, and is a fine job of designing. Its block-cast cylinders—3¾ x 4½ inches bore and stroke—have removable heads, also cast four in a block and containing all the valves, which are seated directly in the casting without the intervention of cages; the exhaust passage opens straight through from the exhaust valves and ends in a discharge opening at the rear of the head casting, and at the opposite, or forward, end is the upper water lead—a big one, by the way. The valve springs are sunk in the water jacket of the head, leaving only enough of the stems sticking up for the rocker arms to act on. Long push-rods from a single camshaft actuate all the valves. The intake manifold is carried to the head casting on the side opposite the camshaft and is a two-branch affair. Just under it is a capacious cast iron oil tank bolted up to the cylinders and connected to the crankcase through a short pipe containing a regulating valve; the lubrication is splashed in the familiar way. The horsepower is 32, the same as the six-cylinder motor, and, as a salesman with a sense of humor explained it, the uncautious prospect is caught coming and going, for if he says he'd like the car all right if it wasn't one of those six-cylinder affairs, he is introduced to the optional "four," and the only alternative to beating an ignominous retreat is to come across with an order.

The number of different shapes a combined breather and oil-filler can take on, and the number of different places where such things can be found, is surprising. Several are found perched on the hollow arms which support the motor, the arm, of course, having no other opening to the air. Incidentally, it is now almost the universal practice to combine the breather and filler. The Michigan motor has its breather on one of the motor arms, and is a good example of the type. Incidentally, so to speak, the eye is very apt to travel from the breather along the arm and over the motor of that same Michigan car and to notice that there are a good many features embodied in it other than breathers. For instance, there is a starter, of the electric type, that drives through the clutch shaft by means of silent chain.

The clutch is a big, capable-looking cone with six plungers under the leather facing backed by adjustable helical springs, the result of this arrangement being extremely smooth and easy starting. A little further back there is a four-speed gearset with direct drive on the top speed. Going from details to generalities, the Michigan appears to be a big car in every way—whether it is the optical effect of the 4½-inch tires, or the moral effect of the "mighty" that the makers use as a prefix, or the capacious-



DEVELOPMENT OF THE COWLBOARD—KNOX, HAYNES AND PREMIER

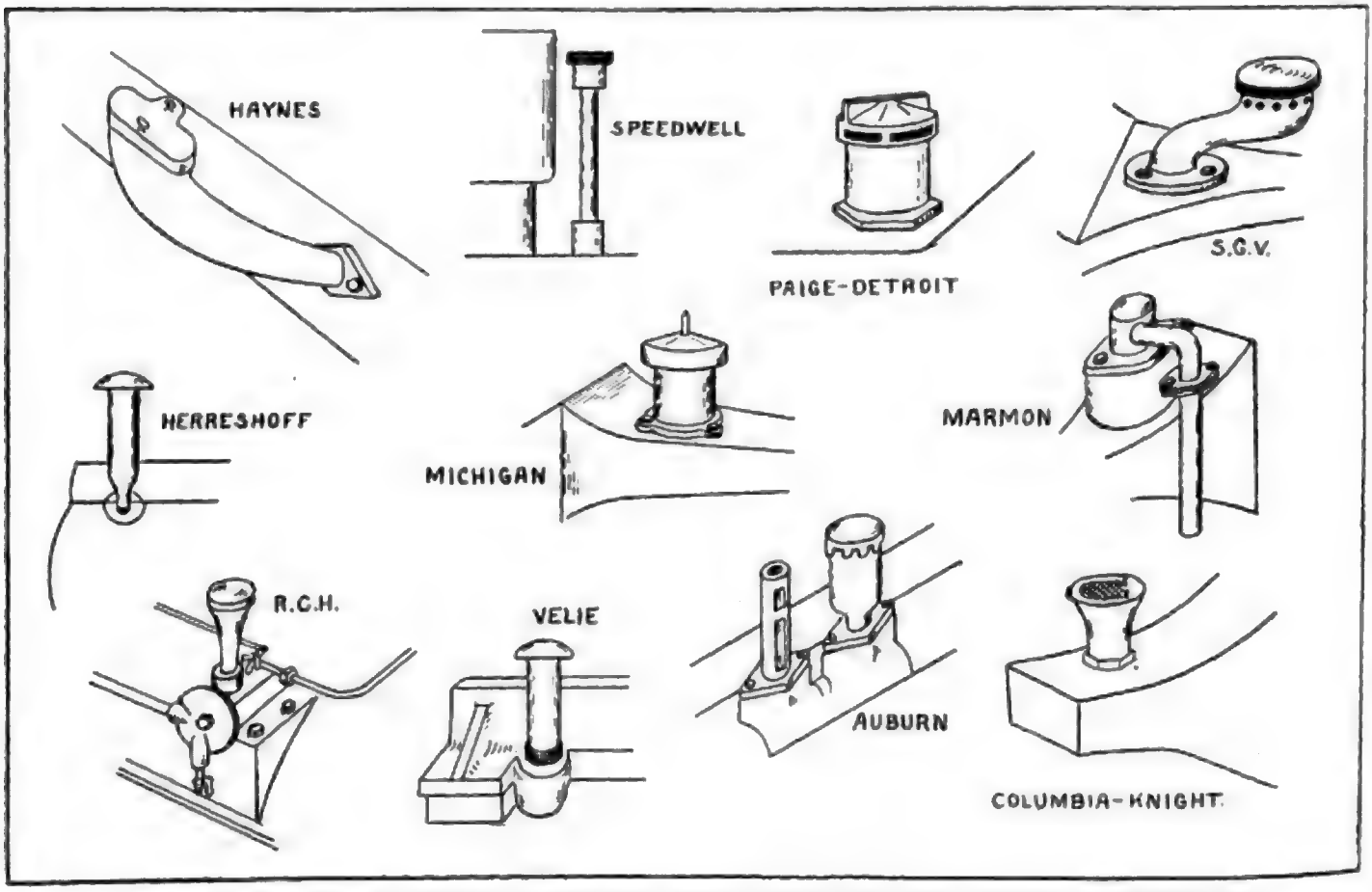


WARREN COWLBOARD

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looking bodies, or all combined—and a glance at the price, which is $1,585 with full equipment, somehow makes the car look still bigger.

To get back to breathers: Examples of pipes which have openings that are easily reached for pouring in oil are found in the breathers of the S. G. V., Haynes, Speedwell, Herreshoff and Velie, among others, all of which have advantages that are obvious. The breather and the oil gauge of the Auburn form a pair, while the breather of the R. C. H. is mounted with the oil-



VARIETY IN FORM AND LOCATION OF BREATHER PIPES, ILLUSTRATING THE ADVANCE OF ACCESSIBILITY

pump base. Any stray oil that splashes from the Marmon motor is piped safely downward, so it cannot slop over the crankcase.

Fiat Adopts Plunger Air Pump.

The Fiat cars have used exhaust pressure to force fuel to the carburetter for so long that the method almost may be called "time-honored," but a new method now is in use. In the side of the crankcase there is a tiny, inconspicuous plunger pump, operated by a cam on a little cross-shaft driven by the camshaft, and this pumps the requisite air. It is as neat and unobtrusive as is everything else in the mechanical make-up of that machine. Another kind of a detail—very much another kind—is interesting, when discovered, if for no other reason than that it is so inconspicuous to the casual observer. The sills which rest on the top of the frame, on each side of the engine space, in the Lenox car, are of aluminum, instead of the usual wood, the object being to eliminate the splitting and bruising to which wood is subject under some conditions; the appearance of the aluminum sills is neat and the utility is obvious.

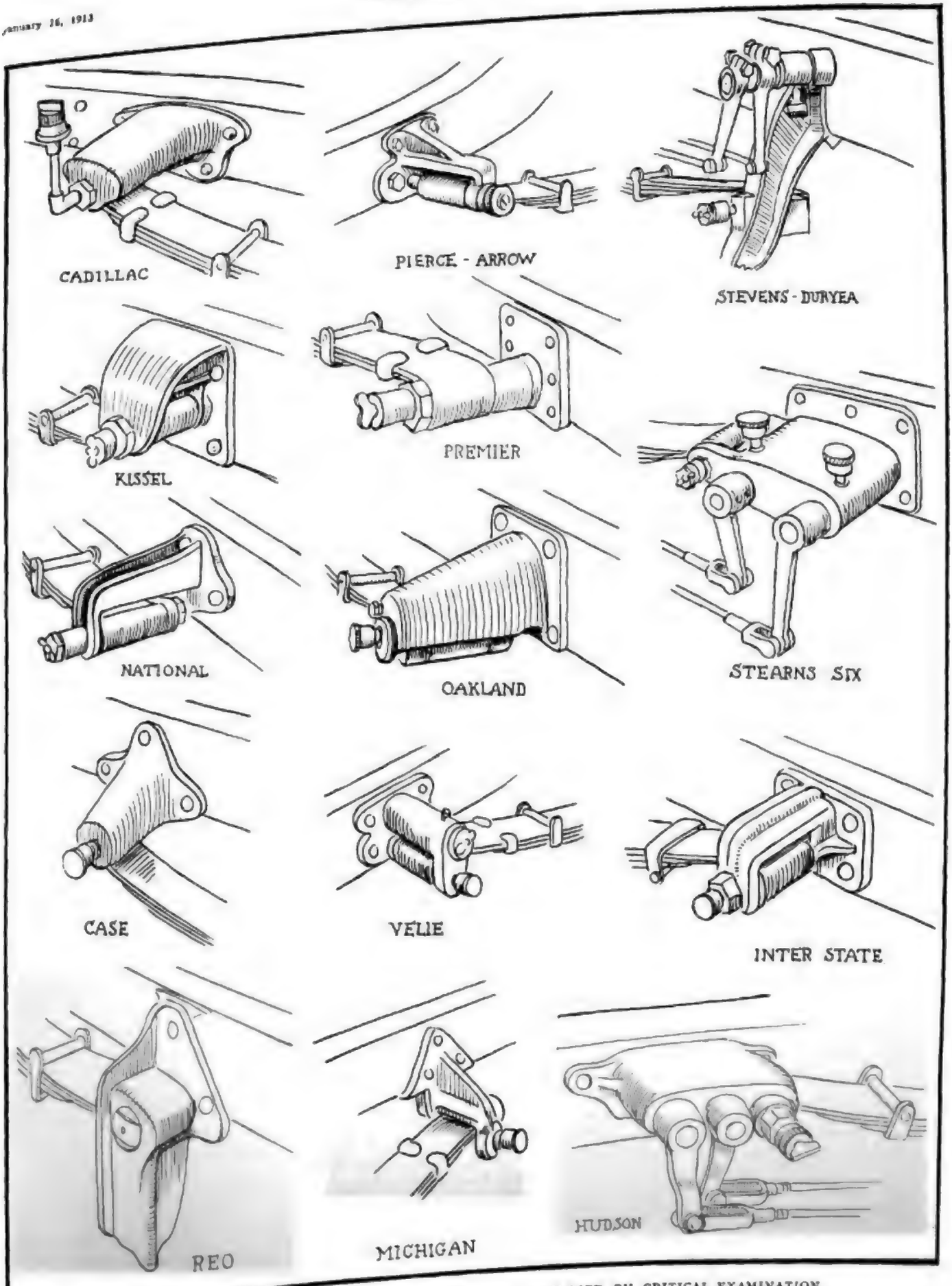
Starter That Resembles "Gas" Motor.

With electric motor starters everywhere in evidence—in profusion, if one cares to apply the term to such things—the Chevrolet people are quite content with their compressed air starter, which is a neat little rotary motor that will turn the engine over at the rate of 300 revolutions per minute and has an exhaust that barks like a young gas engine. There were not a few of those who saw the air compressor, with its two opposed cylinders, who thought it a little gasolene motor, which it resembles very strongly.

Viewing the show in the concrete, one of the striking features that is much more noticeable this year than ever before is the number of cases in which radius rods have been eliminated and the great variety which obtains in the design of the spring hangers, which thus serve a dual purpose in supporting the chassis and taking the drive. In a great many cases, notably on the Cadillac, the Kissel, the Oakland, the Case and a number of others, care has been taken to enclose the spring hanger proper in such a way as to exclude dirt and dust. In other cases, of which the Stevens-Duryea, the Stearns-Knight, and the Hudson and others serve as examples, advantage has been taken of the spring hanger housing as a means of mounting the brake rod cranks and, as may be seen by the accompanying sketches, the arrangement is "neat," to say the least. In still other cases, such as the Reo and a long list of others, the spring hanger is made to serve also as a bracket for the running board. Among the cars that employ a perfectly plain and equally accessible spring hanger devoid of housings or double purposes are the Pierce-Arrow, the Premier, the National, the Velie, the Inter-State and the Michigan.

Landslide to Electric Equipment.

Still another feature which is more than ordinarily apparent, though it should be no surprise by reason of the fact that it was forecast in Motor World's Before-Shows Issue, is the landslide to electric lighting and engine starting equipment. Considering



STUDIES OF SPRING HANGERS—SURPRISING DIVERSITY DISCLOSED BY CRITICAL EXAMINATION

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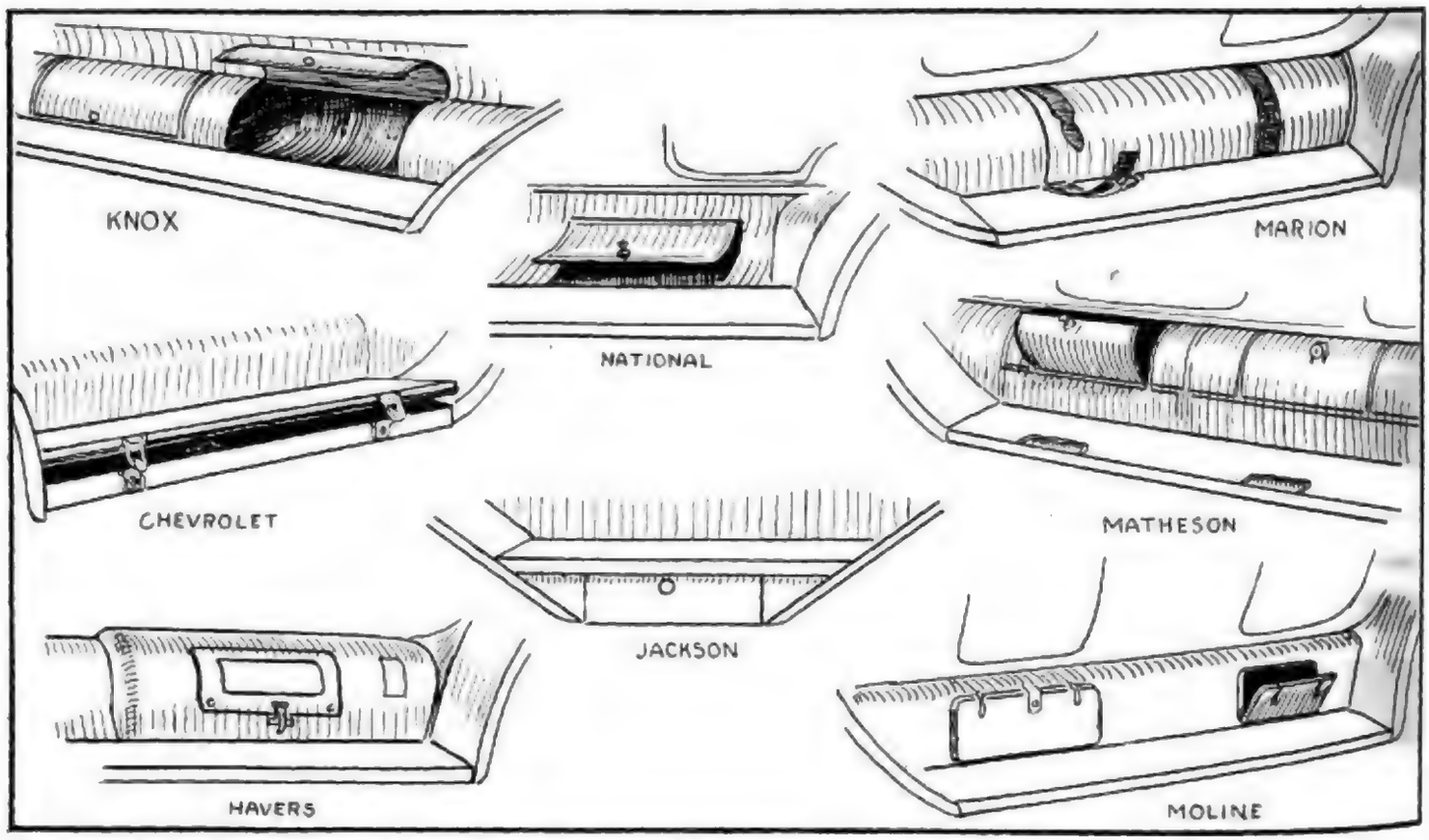
all the gasolene cars at the show—86 brands of them—68, or nearly 80 per cent., are regularly equipped with electric lighting systems and all but a few have electric cranking devices as well, the latest additions to the list being the Locomobile and the Franklin, both of which appear for the first time with such equipment.

Naturally, with such a long list, there exists considerable variety in the method of mounting the generator and the starting motor. For the most part, generators are mounted at the side of the engine, where they may be conveniently driven from the pump or magneto shaft or from the crankshaft by means of a "silent" chain at the front of the crankcase. Much greater variety is apparent in the disposition of starting motors, though in a great many cases engine positions with the drive through the timing gear train are preferred. In the Reo, for instance, the starting motor is mounted transversely on the chassis frame between the clutch and the gearset and is connected to the clutch shaft through the intermediary of worm gearing, the worm wheel being mounted directly on the clutch shaft with the worm on the electric motor. In the Haynes and the Cadillac and the Locomobile and a long list of others, the starting motor is attached to drive the engine through the intermediary of gearing cut on the flywheel of the engine. And in two instances, the Pathfinder and the Herreshoff, the electric starter is built into place on top of the flywheel housing in such a way that the whole power plant becomes in all truth a single unit.

Utilizing Former Waste Spaces.

The mere phrase "clear running boards," which applies to very nearly every car at the show, scarcely is enough to convey its real meaning, particularly in view of the fact that the demand for storage space for tools and tires and odds and ends has decreased no whit, though the demand for the suppression of unsightly tool boxes and other receptacles has increased quite perceptibly. Another surprise of a mild sort is to be found in the many ways in which the difficulty suggested by the problem has been overcome. In a great many cases, notably on the Alco, the Marion, the Matheson, the Pullman, the Columbia, the Kissel and a raft of others too numerous to mention, manufacturers have taken advantage of waste space beneath the frame, or just above it and below the body proper, and have provided clever little "cubby holes" with entrances through the shield between the running board and the frame. Where the shield is convex, as in the Knox and the Marion and a few others, the locker space thus obtained is quite appreciable and almost is sufficient without other provision. Lockers of the kind alter the appearance of the car not at all, except for the addition of a small catch of some kind and the elimination of the tool boxes which hitherto have perched on running boards.

Where still more space is required, or the design of the car will not permit of the use of such cleverly hidden resting places, there are several other locations which are chosen with very nearly equal frequency. The first of them is the dash, particularly where a deep skuttle is used, and the second is the arm rest between the front seats, neither of which locations has been used to any great extent up to the present time. Where the skuttle is deep, there is an abundance of space between its uppermost edge and the floor which is not needed for foot-room and which nominally would go to waste. Manufacturers have not been slow to appreciate that it may be put to a useful purpose for the storage of small tools or spare parts that are too small for inclusion with the larger tools and parts in the tool box proper. Generally, such dashboard lockers are placed in the corners and their doors are guarded with locks, though in several instances, in the Garford and the Cartercar and the Speedwell and others the whole of the space is utilized by making of it either a single large locker or two or more smaller ones. It is a comparatively simple matter, of course, to line the space between the front seats that serves for an arm rest and fit it with a lid, thus providing a more than ordinarily handy receptacle for goggles and



CLEARING THE RUNNING BOARD—SOME EXAMPLES OF METHODS EMPLOYED AND STORAGE SPACE ACQUIRED

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veils and gloves. In several cases, the space between the seats has been utilized to house lighting and starting switches that otherwise would crowd the dash, and in other cases the gasolene tank filler pipe has been brought up between the seats where it is accessible without the necessity for disturbing the passengers.

Where gasolene tanks have been moved from their time-honored place beneath the front seats and relegated to a place of greater conspicuousness in proximity to the rear axle, still more storage space is available, and not a few manufacturers have made it more accessible by making the riser into a door.

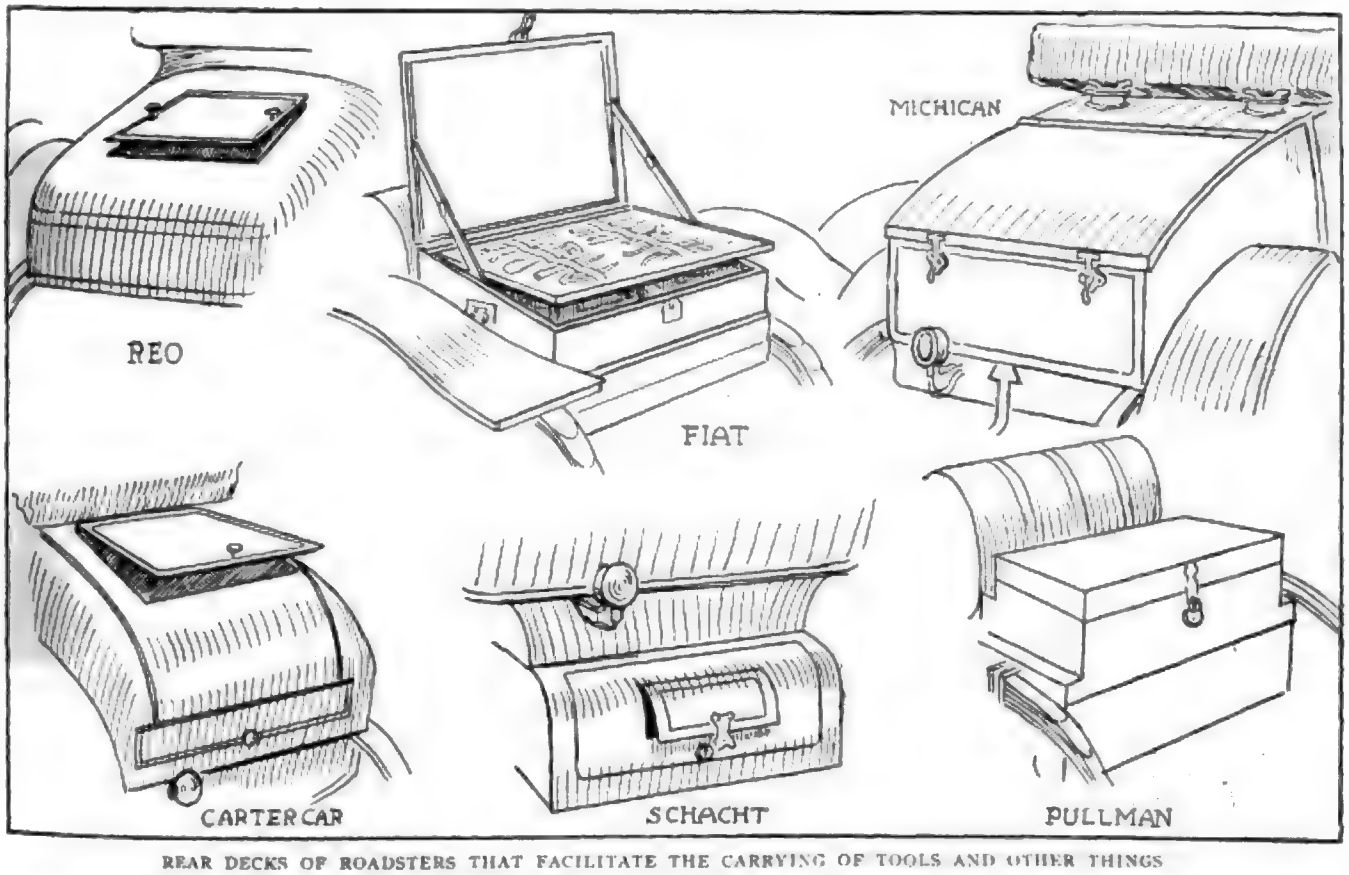
The space beneath the rear seats always has constituted the chief hiding place for tools and tubes, and this space, too, has been made more handy in a number of instances by placing a long door at the front, thus obviating the necessity for removing the seat cushion every time something is needed; the Kissel is only one example of many of the kind. Several makers now locate side curtains in especially prepared compartments under the rear seats, and two of them—the Mercer company and the Oakland company—have killed two birds with one stone, so to speak, by providing liberal sized lockers in the form of tonneau foot rests. In the White cars, side curtains and spare tubes are carried in a pocket at the back of the front seats.

Just why the occupants of a roadster are expected to carry at least three times as much luggage as the occupants of a seven-passenger touring car may not be plainly apparent, but that such is the case is revealed by the exceptionally roomy "trunks" and other storage spaces that are provided on the average roadster. The after deck, to use a nautical expression, forms an ideal place for the location of such conveniences, which serve also to complete designs which otherwise might appear unfinished. The rear of the Michigan roadster, for instance, is exceptionally roomy, though its appearance is neat withal; a single large, rear compartment with an up-lifting lid serves for storage space for all the tools and parts and all the luggage that the average car can be expected to carry, and houses the fuel tanks as well.

Making Division of Rear Spaces.

In the Cartercar, the after deck is in two compartments, one above the other, the larger serving for luggage and the smaller, which is the full width of the body, for the housing of space tires and tubes. At the back of a Fiat roadster, which, by the way, is one of the very few red cars at the show, is fitted with a tool chest and locker that carries a tray in which the tools are fitted in such a way that they cannot rattle; the space beneath is available for anything the owner may choose to put in it. One other instance which serves to illustrate the extent to which otherwise waste space has been put to some useful purpose is to be found in the Cole limousine. At the back corners, at about the level of the eyes, there are deep, dark pockets that are concealed by flaps made of the same material as the upholstery.

For variety in the location of lockers, and the actual amount of storage space provided for the size of the car, none can hope to approach the Premier cabriolet, which quite appropriately has been named the "Killarney Coleen." It is a beautiful piece of work, finished in green and gold, and the number of "bunks" and "cubby holes" it conceals is nothing short of remarkable. In the first place, there is a great big locker at the rear that serves to house the storage batteries, with plenty of room for tools. In the dash there is what has been styled a "cellarette" that is large enough to hide a sufficient quantity of cheering fluid to make almost any one want to cheer. But the largest space of all—a space that is large enough to carry an outfit of clothing for nearly any kind of a function that a motorist might be expected to attend, from a fight to a frolic



REAR DECKS OF ROADSTERS THAT FACILITATE THE CARRYING OF TOOLS AND OTHER THINGS

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—is behind the back of the seat, and it is so cleverly hidden that none but those who know the combination may expect to find it. The back of the seat hinges forward, revealing a cupboard large enough for two suit cases, to say nothing of room for three or four Thermos bottles and a good sized package of lunch.

The Premier "Killarney Colleen Cabriolet" is otherwise distinctive, also, as the nearest approach to a landaulet at the show. Strictly speaking, it is not a landaulet, of course, though the back lets down just like the back of a landaulet. The back portion of the roof is made of green leather, and it is one of the wonders of those who view it just how the painter managed to match the body and the leather so perfectly. The body is belted with red and fitted with red trimmed wire wheels.



LOOKING DOWN ON THE ELEVATED PLATFORM ON WHICH BOTH CARS AND ACCESORIES ARE DISPLAYED

Ventilating Front Compartments.

As a general rule, greater attention has been paid to the ventilation of the front compartments of open bodies, the realization apparently having sunk in that the heat of the engine is an undesirable adjunct to the heat of the sun on a summer day. In closed bodies, however, there still exists a lamentable lack of ventilating methods, few makers going to greater trouble or expense to provide fresh air than to supply mininture shutters up near the roof in the partition between the driver and the other passengers. Few realize that fresh air will find no ingress unless the foul air is expelled or permitted to escape, and though it always is possible to open a window and in that way to create a draft, drafts are not always appreciated. In appreciation of the necessity for ventilation in closed bodies, only one maker, as revealed by the cars on exhibition, has attempted a solution of the problem. The innovation is to be found in the Hupmobile coupe, an unusually "square" body with a goodly sized circular ventilating dome in the center of the roof; as a matter of fact, the dome, which is so flat as to be just apparent, occupies very nearly all of the roof, and there can be little doubt but that it provides an abundance of fresh air without the inconvenience due to drafts.

With regard to ventilation, it is interesting, or, rather, amusing, to observe that quite a few makers quite unconsciously have provided a method of heating closed bodies that is not always desirable and that may prove really obnoxious, as well as noxious, to those of delicate sensibilities. The method consists, briefly, in leaving open the lower end of the compartment into which the windows between the front and rear compartments drop. Where the underpan is continued back far enough, and in the majority of cars it is fairly long, heated air from the engine compartment is pumped directly into the body.

Of course, it needs no elaboration to make plain that seat cushions have become just about twice as thick in the past year as they were previously, and another feature which is common to a great many cars is a general up-tilting of the front of the cushions for the purpose of conducing to greater comfort. Also, in at least two instances, notably the Stoddard-Dayton and the Stevens-Duryea, means for liberal adjustment of the seats is provided to accommodate them to the long and to the short. The Stoddard-Dayton arrangement is not new, of course, for it appeared at the last show; it applies only to the front seat. In the Stevens-Duryea, however, the adjustment applies to the tonneau seat and is unusual in that it may be made at will and with no greater effort than the turning of a conveniently located wheel. The seat may be moved forward three inches and the front may be raised two inches instantly and easily.

Convenience of Greater Leg Room.

Coincident with the general increase in wheelbase lengths, it follows that leg-room has been increased in the majority of cases, and with few exceptions elbow-room also has been increased in proportion. However, little variety in the method of arranging seats is apparent, the majority of makers preferring to stick to the orthodox arrangement. One exception is to be found in the

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PIERCE-ARROW EXHIBIT IN THE CENTER OF THE GARDEN, SHOWING RAISED POLISHED CHASSIS



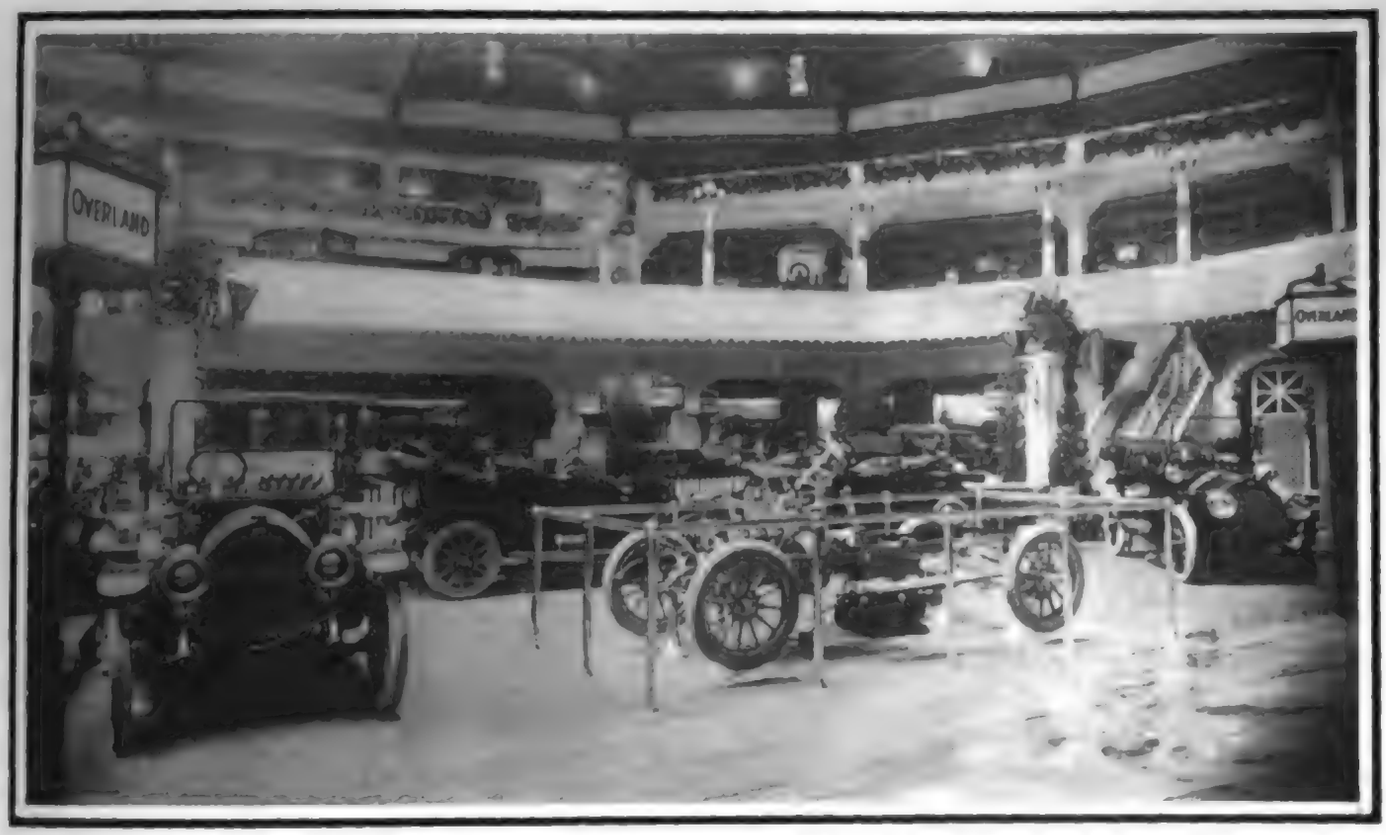
PACKARD EXHIBIT IN THE GARDEN WITH PHAETON IN FOREGROUND FLANKED BY THE NEW "CABETTE"



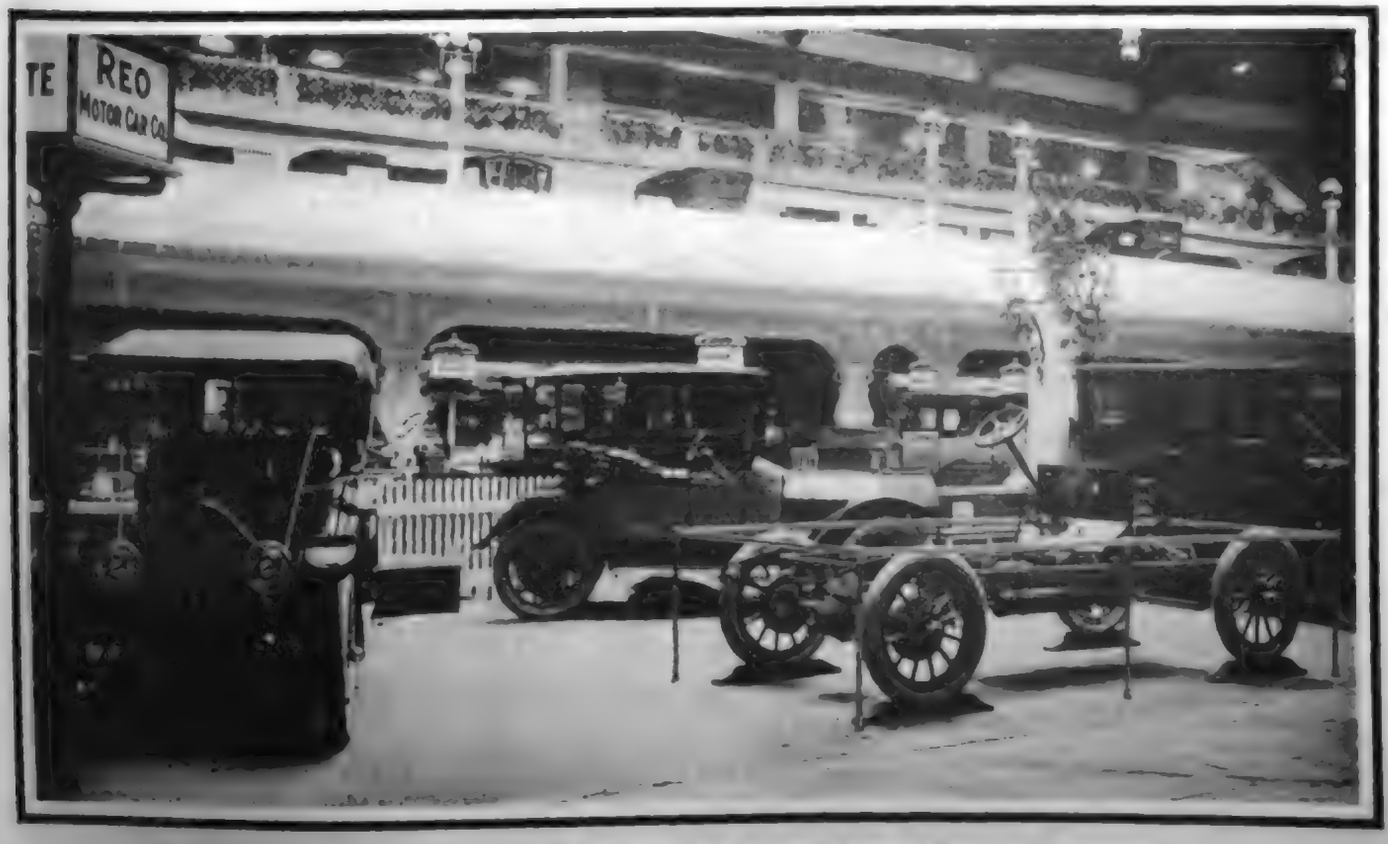
GROUP OF WIRE-WHEELED HENDERSONS AS THEY APPEAR IN A CORNER OF THE PALACE



HOW HUPMOBILES ARE DISPLAYED IN A CORNER OF THE PALACE WITH A PICTURESQUE BACKGROUND



VIEW OF THE OVERLAND EXHIBIT IN THE GARDEN SHOWING BRASS RAILED MOTOR DRIVEN CHASSIS



REO "THE FIFTH" AT THE GARDEN SHOWING ITS VARIETY AND ITS MANNER OF DISPOSAL



ON THE ELEVATED PLATFORM IN THE GARDEN WHERE DREADNOUGHT MOLINES HOLD THE BOARDS



WHERE JACKSON CARS ARE DISPLAYED IN THE GARDEN, SHOWING TWO NEW MODELS



ATTENTION-COMPELLING NEW STUDEBAKER LINE AS IT IS STAGED IN GRAND CENTRAL PALACE



PATHFINDER EXHIBIT IN THE PALACE WITH THE WIRE-WHEELED "CRUISER" MODEL IN THE FOREGROUND



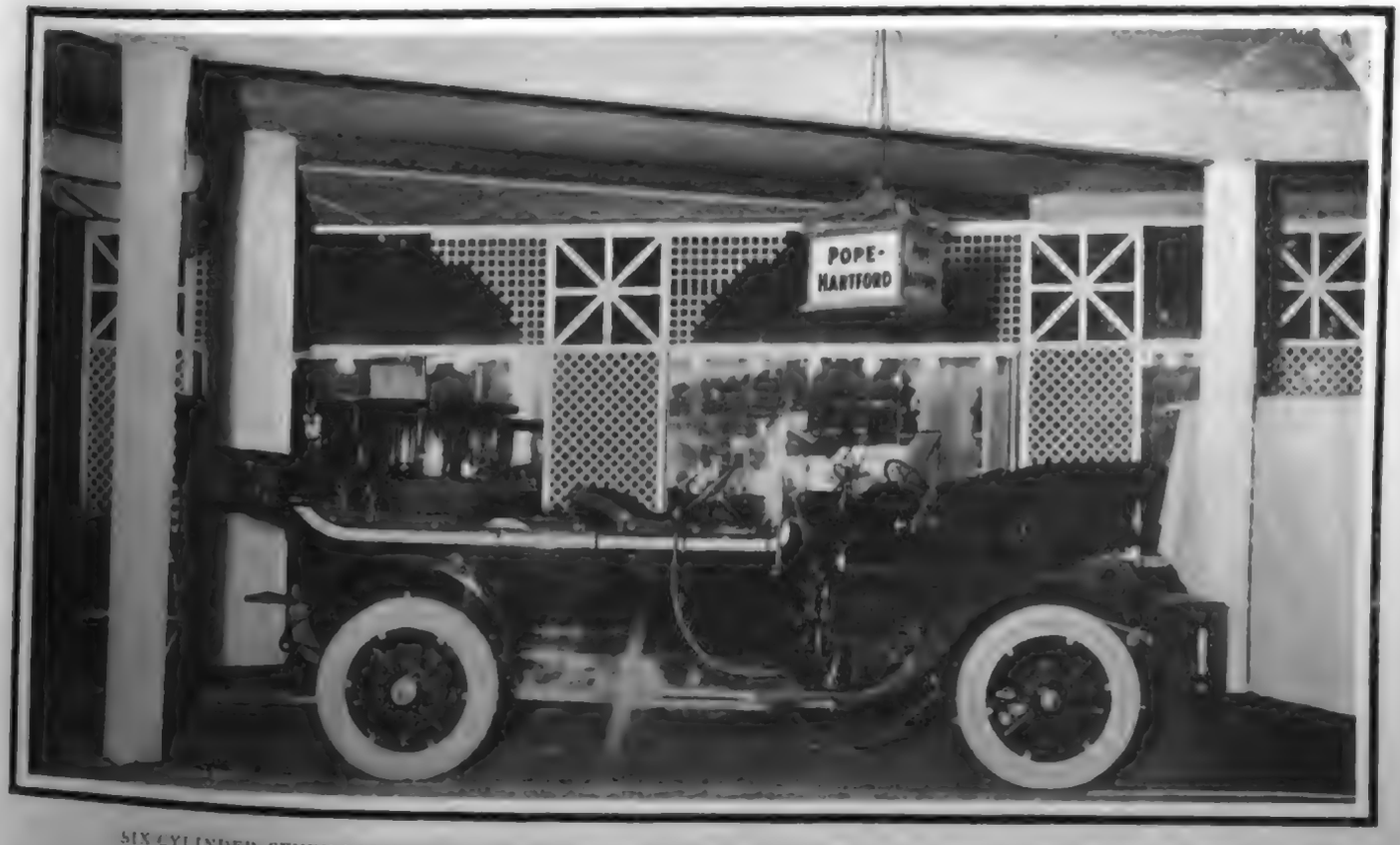
FIVE CARS THAT FORM THE CHALMERS DISPLAY ON THE MAIN FLOOR OF THE GARDEN



GENERAL VIEW OF THE PULLMAN EXHIBIT ON THE ELEVATED PLATFORM IN MADISON SQUARE GARDEN



GARDEN SPACE WHERE HUDSONS ARE DISPLAYED WITH THE SIX CYLINDER CHASSIS IN THE CENTER



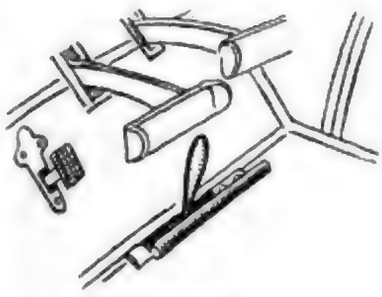
SIX CYLINDER SEVEN-PASSENGER POPE-HARTFORD TOURING CAR WHICH IS EXHIBITED IN THE GARDEN



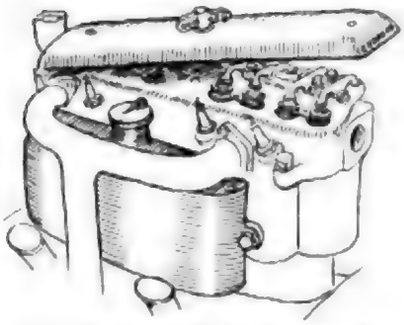
ONE OF THE FEW REAL "SHOW" CARS—THE LOCOMOBILE CRIMSON LIMOUSINE IN THE GARDEN



IMPRESSIVE ROW OF STEARNS-KNIGHT CARS IN THE GARDEN WITH THE NEW "SIX" ON THE RIGHT

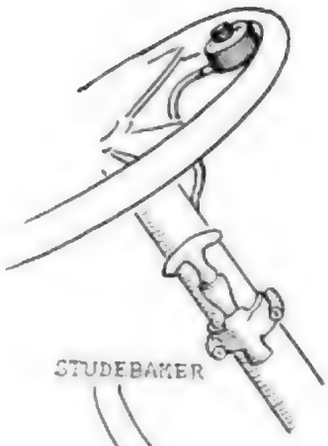


WESTCOTT

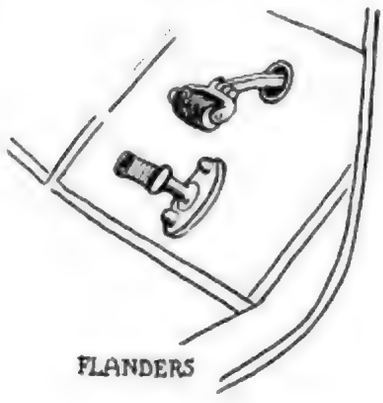


LITTLE FOUR-CYLINDER MOTOR

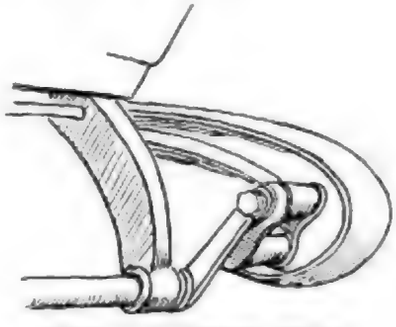
Cole roadster, in which three seats are arranged abreast after the manner developed by the Cole company for the last show and exhibited in the form of a four-seated roadster with all four seats in a row, side by side. In quite a few cases, the auxiliary seats that make a seven-passenger car out of a five-passenger car have been better disposed of than in the past, the Rambler, the Stoddard-Dayton, the Chevrolet, the Flanders and a number of others exhibiting seats which fold up quite out of the way and very nearly out of sight.



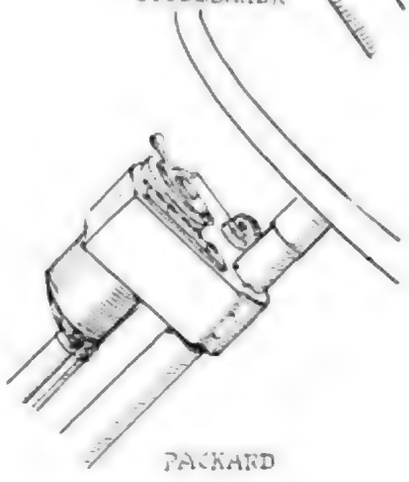
STUDEBAKER



FLANDERS

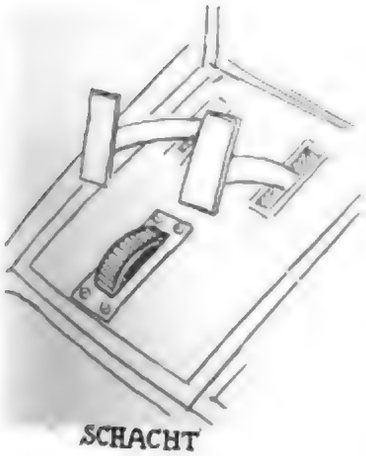


BUFFALO ELECTRIC SPRING

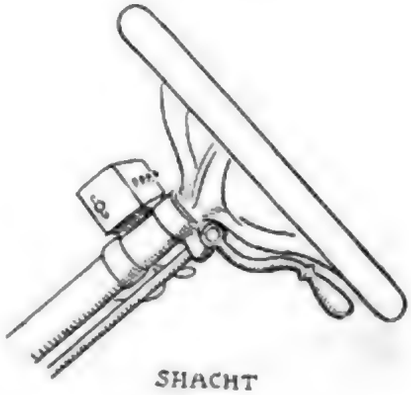


PACKARD

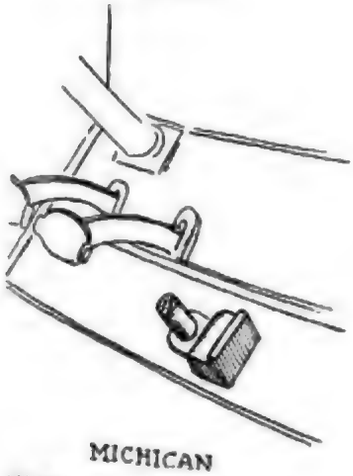
In one respect, the exhibition would seem to indicate a retrogression instead of an advance, judging by the standards that were set last year. To those who have good memories, the clean and clear dashboards of last year's cars can be easily recalled—the order of the day was "nothing on the dashboard that can be placed elsewhere." Now, however, everything is placed on the dashboard, and though the practice is a laudable one in that it places the operation of the car right under the gaze of the driver, leaving little to guesswork, it tends also to increase complexity. Indicative of the fact, several manufacturers of electric lighting and engine starting systems incorporating ammeters have substituted for these devices plain indicators, or annuncia-



SCHACHT

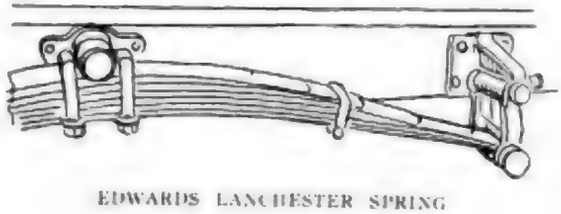


SHACHT

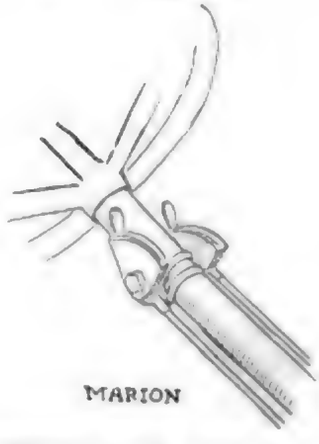


MICHIGAN

STUDY IN ACCELERATOR PEDALS



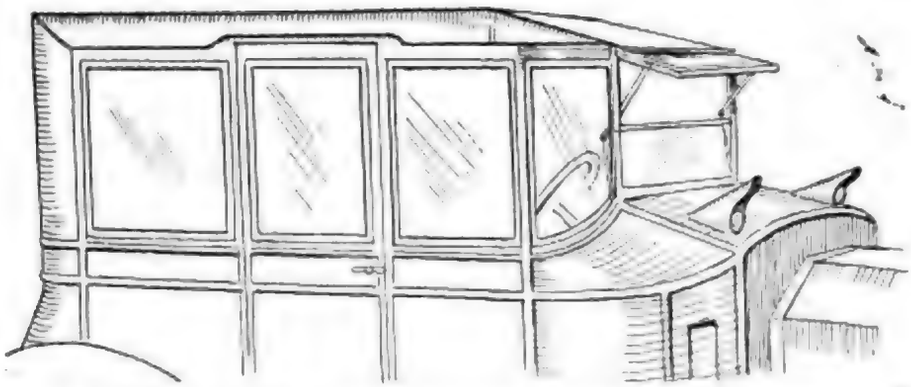
EDWARDS LANCHESTER SPRING



MARION

STEERING POST CONTROL METHODS

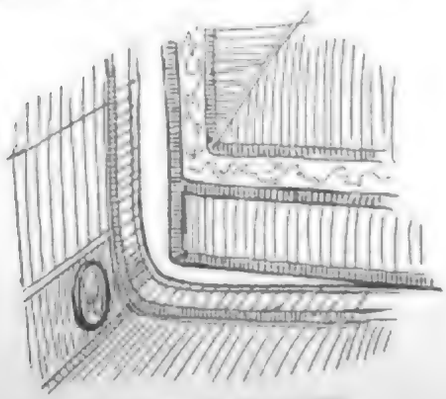
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PEERLESS STRAIGHT-LINE BODY THE SEVEREST IN THE SHOW

tors, which tell at a glance whether the battery is "charging" or "discharging," thus doing away with the added confusion that might be bred of inability properly to read a meter.

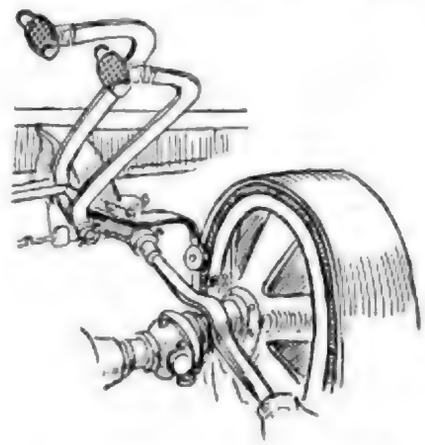
Side by side with ammeters or indicators there are oil and gasolene gauges, ignition switch, carburetter adjustment, speedometer and clock, engine starting control, lighting control and any other devices that the maker may deem of sufficient interest to the owner to be placed before his eyes. As a matter of fact, no inconsiderable number of makers deliberately have created supplementary dashboards practically for the sole purpose of mounting such devices. "Cowl dashboards" they are styled, and even though they do give the average automobile dash the appearance of the end of a locomotive boiler with its multitudinous display of gauges and cocks and whatnots, they serve a useful purpose, always assuming that the equipment on them is absolutely necessary, in taking the various gauges, controls, etc., out of the obscurity of the dashboard proper and placing them where they can be seen and, what is more to the point,



LOZIER STEP LIGHT

where they can be reached by the driver from his seat.

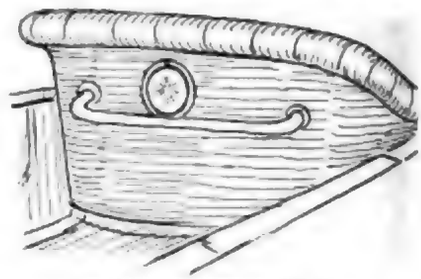
Though there probably is less necessity for a dash lamp on a cowl dashboard for the reason that its instruments are very much more exposed than when mounted beneath a deep skuttle, the majority of such dashes nevertheless are fitted with lamps, which is natural, inasmuch as the amount of current they consume scarcely is measurable and there is practically an inexhaustable supply at hand. Also, small electric lamps now make their appearance in places which heretofore have been foreign ground to them. In the Garford touring car, for instance, there is a tonneau lamp—a dome—set in flush with the back of the driver's



MICHIGAN CLUTCH ASSEMBLY

seat; several makes of cars are fitted with plug sockets on the dash, from which a lamp on an extension cord can be carried almost anywhere about the car; several cars are fitted with step lamps which burn only when the tonneau door is opened; a Lozier limousine is fitted with a step lamp of the kind fitted flush with the back of the driver's seat near to the floor. Cigar lighters that glow in a manner to discourage the fiercest of breezes, also are standard equipment on a number of cars, and on the Pullman the electric equipment is complete, even to a tire vulcanizer.

In the manner of illuminating the insides of closed cars, there is not a great deal of variety, the majority of manufacturers making use of a standard form of Pullman

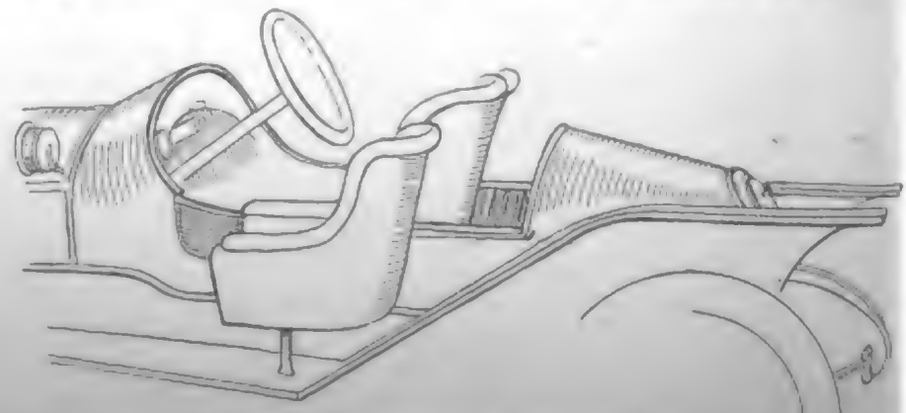


GARFROD TONNEAU LAMP

lamp which ordinarily is nothing more than a small polished plate; the plate rotates in a socket, however, revealing a small lamp mounted on the reverse side which lights up automatically when the plate is shifted. Dome lights in the roof are fairly common, and in the Selden a single dome in the center is supplemented by smaller domes in the rear corners; the corners of the Winton limousine are a little more ornate with miniature fixtures mounting two lights, and in the Locomobile "show" limousine truly artistic pillar lamps help to make beautiful the interior.

Blending of Lines a Prominent Feature.

To the careful observer, there is apparent a much greater attempt to blend the lines of the hood with those of the skuttle dash in a manner to make of the two practically one unit, a fact which is particularly noticeable in the new Stevens-Duryea cars in which the hood is made slightly sloping and joins to a concave skuttle without a break. The Oldsmobile, Locomobile, Peerless, Westcott and Pathfinder all serve as examples of this newer art. Carrying the idea a little further, the Mitchell and the Norwalk and a few others have side lamps mounted flush in the filler board of the windshield instead of in the dash proper.



COLE THREE-SEATED ROADSTER SHOWING LUGGAGE SPACE

Similarly, the idea of mounting the side lamps in integral projecting tubes on the skuttle—small tunnels, as it were—is more prevalent than it was, and on several cars, among which the new Oakland is one of the most noticeable, very pleasing effects have been obtained by deviating materially from stereotyped lines.

Variations Among Accelerators.

Probably appreciating the element of danger in the unprotected accelerator pedal and by way of providing greater comfort for the driver, a number of makers have adopted pedals that are quite different from those that have been used in the past. On the Michigan cars, for instance, the accelerator is a small, round button and is provided with a foot rest to ease the strain on the driver's leg muscles; in the Schacht, the accelerator is nothing more or less than a small gear wheel with very fine teeth, the result being that it is impossible inadvertently to "step on it," while at the same time holding it open continuously imposes no unnecessary strain on the driver; in Westcott cars much the same result is obtained, though the arrangement is quite different, the pedal swinging sideways behind a rest for the driver's foot; the Flanders accelerator is a roller and it, too, is provided with a foot rest.

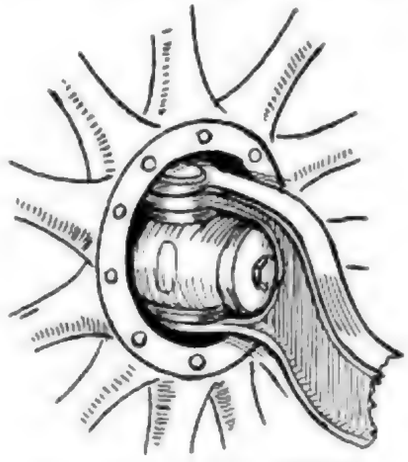
Arrangements of Control Devices.

Placing controls of one kind or another, and in some cases all controls, nearer to the operator than is possible even when they are mounted on a cowl dashboard, quite a few makers have made use of the steering column to mount various devices. In the Packard, all the controls are centralized on a steering column box and a somewhat similar arrangement is made use of on Schacht cars, in which the steering column unit carries the lighting switches and the signal button; the starting gear control is located beneath the steering wheel, where it is instantly accessible. The location of carburetter adjustment controls on the steering column is fairly common practice and is to be found on Marion and National cars and a long list of others. On the new Studebaker cars, the signal horn button is mounted directly on the steering wheel, with the wires leading down the post in a neat metal housing. The starter control on the Studebakers also is mounted on the steering column and is nothing more than a small ring which is attached to a metal cord which sets the starter in motion; the cord is carried within the steering post and thus is out of the way and impossible of accidental derangement.

Another of the fine points in new design which has as its object the betterment of construction in general and to obtain easier steering and a shorter turning radius, to be specific, is to be found in the Marmon "six" steering pivot. The pivot proper is contained within the hub of the wheel in such a manner that its center is in the same plane as the center of the wheel.

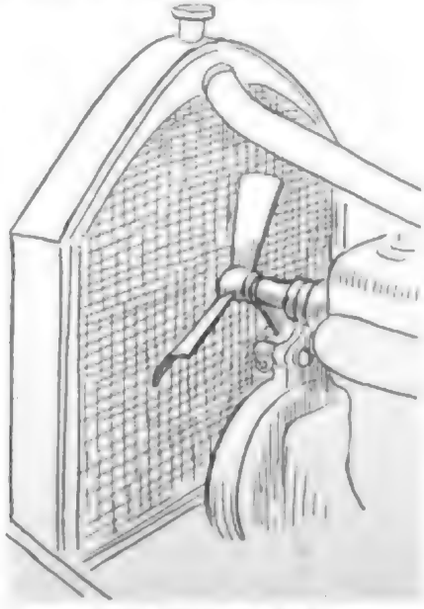
Efforts to Attain Riding Ease.

It is just possible that the uninitiated might gain the impression, after looking



MARMON STEERING KNUCKLE

at the rear springs of the Buffalo electric cars, that the graceful scrolled effect was introduced for decorative purposes. While there is no doubt that the springs are good to look at, they were designed primarily



COLE COOLING FAN

for easy riding; vibrations are damped and taken up in passing through the convolutions of the ends, and the machine rides with a softness and ease that is an indication of the fact that the curves were put in for something more than ornamentation.

Unusually easy riding is one of the claims put forward by the makers of the King for the attractive little car bearing that name. The rear springs are of the semi-elliptic cantilever type—that is, one end of the spring rests on the axle and the other end, as well as the center of the spring, are linked to the frame; a distinct shock-absorber effect is produced on a rough road.

Two Cars of Distinctive Features.

The new Schacht, an unheralded exhibit, is a fine, roomy five-passenger touring car with 45-50 horsepower block-cast motor, cone clutch, three-speed selectively controlled gearset and final drive by means of the usual shaft and bevel gears to the full-floating rear axle. The wheelbase is 120 inches and the 36-inch wheels are fitted with 4-inch tires. Left steer and center control are features, and it is an indication of the up-to-dateness of the machine that it is equipped with an electric lighting and starting system.

The Keeton exhibit, a six-cylinder touring car and a six-cylinder chassis, came direct from the Importers' Salon to the Palace, where the less limited space gives a much better opportunity to get an idea of the really fine appearance of the machines. If there is anything in combinations the Keeton ought to be considerable of a car, claiming, as it does, a European model, an American designer and a Canadian factory.

Cars That Constitute Part I of the New York Show.

Those Staged in Madison Square Garden.

American Locomotive Co., Providence, R. I.—One six-cylinder five-passenger Alco touring car.

Auburn Automobile Co., Auburn, Ind.—Three Auburn cars: Two six-cylinder five-passenger touring cars and one four-cylinder five-passenger touring car; one six-cylinder chassis.

Buick Motor Co., Flint, Mich.—Five four-cylinder Buick cars: Two roadsters and three five-passenger touring cars; one chassis.

Cadillac Motor Car Co., Detroit, Mich.—Five four-cylinder Cadillac cars: One each roadster, coupe, double limousine, five-passenger touring and seven-passenger touring; one chassis.

Carterear Co., Pontiac, Mich.—Four four-cylinder friction driven Carter cars: One each coupe, Sedan, roadster and five-passenger touring car; one chassis.

Chalmers Motor Co., Detroit, Mich.—Four Chalmers cars: One six-cylinder, five-passenger touring car, two four-cylinder five-passenger touring cars and one four-cylinder limousine.

Columbia Motor Car Co., Hartford, Conn.—Three four-cylinder Columbia-Knight cars: One each five- and seven-passenger touring cars and one limousine.

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GROUP OF FRANKLIN "SIXES" IN THE GARDEN—THE ONLY AIR-COOLED CARS IN THE SHOW



HAYNES GARDEN EXHIBIT ON THE ELEVATED PLATFORM—ONE OF THE NEW FOUR-CYLINDER MODELS IN FOREGROUND

Cunningham, Son & Co., J., Rochester, N.Y.—Two four-cylinder Cunningham cars: One each seven-passenger touring car and limousine; one four-cylinder motor.

Flanders Motor Co., Detroit, Mich.—Three six-cylinder Flanders cars: Two five- and one seven-passenger car.

Franklin Mfg. Co., H. H., Syracuse, N. Y.—Four six-cylinder air-cooled Franklin cars: One roadster, one four-passenger touring car and two five-passenger touring cars.

Garford Co., Elyria, O.—Three six-cylinder Garford cars: One each roadster, five-passenger touring and town cars; one six-cylinder chassis.

Haynes Automobile Co., Kokomo, Ind.—Three Haynes cars: One six-cylinder seven-passenger touring car, one four-cylinder four- and one four-cylinder five-passenger touring cars; one four-cylinder chassis.

Hudson Motor Car Co., Detroit, Mich.—Three Hudson cars: One each six-cylinder five-passenger touring car and limousine and one four-cylinder five-passenger touring car; one six-cylinder chassis.

Jackson Automobile Co., Jackson, Mich.—Four Jackson cars: One six-cylinder seven-passenger touring car, two four-cylinder five-passenger touring cars and one four-cylinder roadster.

Knox Automobile Co., Springfield, Mass.—Three Knox cars: Two six-cylinder seven-passenger touring cars and one four-cylinder double limousine.

Locomobile Co. of America, Bridgeport, Conn.—Two six-cylinder Locomobile cars: One each double limousine and five-passenger touring car; one six-cylinder chassis.

Lozier Motor Co., Detroit, Mich.—Four six-cylinder Lozier cars: One each four-, five- and seven-passenger touring cars and one limousine.

Maxwell-Briscoe Motor Co., Tarrytown, N. Y.—One four-cylinder Maxwell five-passenger touring car.

Mercer Automobile Co., Trenton, N. J.—Three four-cylinder Mercer cars: Two roadsters and one five-passenger touring car; one chassis.

Moon Motor Car Co., St. Louis, Mo.—Four four-cylinder Moon cars: Two five-passenger touring cars, one four-passenger touring car, and one roadster; one six-cylinder motor.

Nordyke & Marmon Co., Indianapolis, Ind.—Two Marmon cars: One six-cylinder seven-passenger touring car and one four-cylinder five-passenger touring car; one six-cylinder chassis.

Matheson Automobile Co., Wilkes-Barre, Pa.—One six-cylinder seven-passenger Matheson touring car; one six-cylinder chassis.

Mitchell-Lewis Motor Co., Racine, Wis.—Three Mitchell cars: One each six-cylinder five- and seven-passenger touring cars, one four-cylinder five-passenger touring car; one six-cylinder chassis.

Moline Automobile Co., Moline, Ill.—Two four-cylinder Moline cars: One each five-passenger touring car and coupe.

National Motor Vehicle Co., Indianapolis, Ind.—Four four-cylinder National cars: One each four- and five-passenger touring cars, one limousine and one roadster; one chassis.

Oakland Motor Car Co., Pontiac, Mich.—Five Oakland cars: One six-cylinder five-passenger touring car and one each four-cylinder roadster and coupe, two four-cylinder five-passenger touring cars; one six-cylinder chassis.

Olds Motor Works, Lansing, Mich.—Three Oldsmobile cars: One each six-cylinder five- and seven-passenger touring cars; one four-cylinder five-passenger touring car.



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Willys-Overland Co., Toledo, O.—Four four-cylinder Overland cars: Three five-passenger touring cars and one roadster; one chassis.

Packard Motor Car Co., Detroit, Mich.—Four six-cylinder Packard cars: One each seven-passenger touring car, limousine, brougham and phaeton.

Peerless Motor Car Co., Cleveland, O.—Three six-cylinder Peerless cars: One each limousine, Sedan and seven-passenger touring cars; one chassis.

Pierce-Arrow Motor Car Co., Buffalo, N.Y. Four six-cylinder Pierce-Arrow cars: Two limousines and one each five- and seven-passenger touring cars; one chassis.

Pope Mfg. Co., Hartford, Conn.—Three Pope-Hartford cars: One each six-cylinder seven-passenger touring car and limousine and one four-cylinder five-passenger touring car.

Pullman Motor Car Co., York, Pa.—Four Pullman cars: One six-cylinder seven-passenger touring car, two four-cylinder five-passenger touring cars and one four-cylinder roadster.

Premier Motor Mfg. Co., Indianapolis, Ind.—Three six-cylinder Premier cars: One each five- and seven-passenger touring cars and one coupe with collapsible top; one chassis.

Reo Motor Car Co., Lansing, Mich.—Three four-cylinder Reo cars: One each five-passenger touring car, limousine and roadster; one chassis.

Selden Motor Vehicle Co., Rochester, N. Y.—Two four-cylinder Selden cars: One each five-passenger touring car and limousine; one chassis.

S. G. V. Co., Reading, Pa.—Two four-cylinder S. G. V. cars: One each five-passenger touring car and limousine; one chassis.

Stevens-Duryea Motor Co., Chicopee Falls, Mass.—Three six-cylinder Stevens-Duryea cars: One each five- and seven-passenger touring cars and one limousine; one chassis.

Stearns Co., F. B., Cleveland, O.—Three Stearns-Knight cars: One each six-cylinder seven-passenger touring car and limousine and one four-cylinder five-passenger touring car; one six-cylinder chassis.

Dayton Motor Car Co., Dayton, O.—Four Stoddard Dayton cars: Two six-cylinder Knight engine seven-passenger touring cars; one each five- and seven-passenger four-cylinder poppet-valve engine cars.

White Co., Cleveland, O.—Four White cars: One each six-cylinder seven-passenger touring car and double limousine; one each four-cylinder five- and seven-passenger touring cars.

Winton Motor Carriage Co., Cleveland, O.—Four six-cylinder Winton cars: One each four-, five- and seven-passenger touring cars and one double limousine.

Cars Staged at Grand Central Palace.

Abbott Motor Co., Detroit, Mich.—Six four-cylinder Abbott-Detroit cars: Three touring cars, one three-passenger roadster, one two-passenger roadster and one limousine; one four-cylinder chassis.

American Motors Co., Indianapolis, Ind.—Five American underslung cars: Two touring cars, one roadster and one Berlin, all four-cylinder; one six-cylinder touring car; one four-cylinder chassis.

Bergdoll Motor Co., Louis J., Philadelphia, Pa.—Five four-cylinder Bergdoll cars: Three touring cars, one limousine and one roadster; one four-cylinder chassis.

Briggs-Detroiter Co., Detroit, Mich.—Three four-cylinder Detroiter cars: One roadster and two touring cars; one four-cylinder chassis.

Buffalo Electric Vehicle Co., Buffalo, N. Y.—Three Buffalo electric cars: Two inside driven coupes and one roadster.

Church-Field Motor Co., Sibley, Mich.—Two Church-Field electric cars: One runabout and one coupe.

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ONE OF THE BROAD AISLES IN THE PALACE SHOWING THE EFFECT OF THE DECORATIVE TREATMENT



"MIGHTY MICHIGAN FORTY" AS IT APPEARS ON THE MAIN FLOOR OF GRAND CENTRAL PALACE

Cole Motor Car Co., Indianapolis, Ind.—Six Cole cars: One six-cylinder and two four-cylinder touring cars, one six-cylinder limousine, two four-cylinder roadsters: one six-cylinder chassis.

Columbus Buggy Co., Columbus, O.—Two Firestone-Columbus cars: One four-cylinder road-ster and one six-cylinder touring car; one Columbus electric coupe.

Cutting Motor Car Co., Jackson, Mich.—Four Cutting cars: One four-cylinder and one six-cylinder touring car, one four-cylinder roadster and one racing car; one four-cylinder chassis.

George W. Davis Carriage Co., Richmond, Ind.—Two four-cylinder Davis touring cars.

Hupp Motor Car Co., Detroit, Mich.—Five Hupmobile four-cylinder cars: Two touring cars, two roadsters and one coupe; one four-cylinder chassis.

Ideal Motor Car Co., Indianapolis, Ind.—Three Stutz cars: Two four-cylinder roadsters and one six-cylinder touring car; One six-cylinder chassis.

Imperial Automobile Co., Jackson, Mich.—Four four-cylinder Imperial touring cars.

Inter-State Automobile Co., Muncie, Ind.—Five Inter-State cars: One four- and one six-cylinder touring cars, one four-cylinder roadster, one four-cylinder coupe and one six-cylinder Berlin; one six-cylinder chassis.

Thomas B. Jeffery Co., Kenosha, Wis.—and one six-cylinder; one four-cylinder chassis.

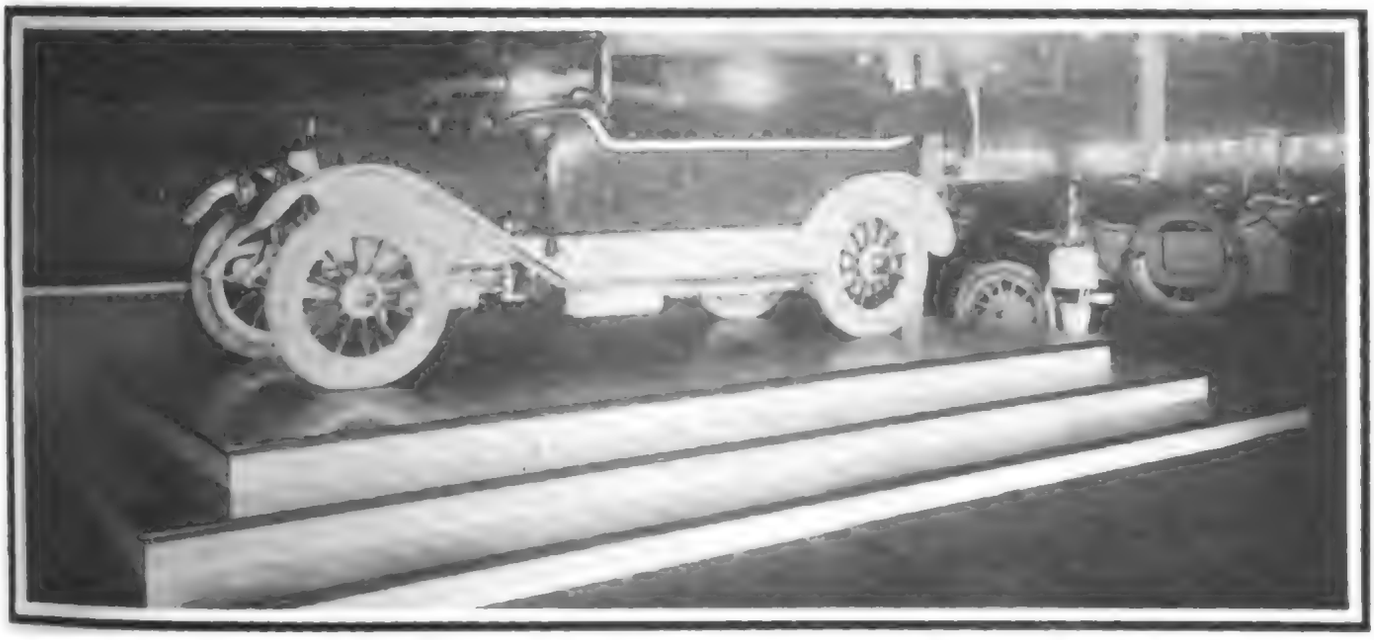
Marathon Motor Works, Nashville, Tenn.—Four Marathon four-cylinder cars: Two touring cars, one coupe and one roadster.

Marion Motor Car Co., Indianapolis, Ind.—Three four-cylinder Marion cars: Two touring cars and one roadster; one four-cylinder chassis.

Metz Co., Waltham, Mass.—Two Metz four-cylinder friction-driven runabouts and one four-cylinder friction-driven chassis.

Michigan Motor Car Co., Kalamazoo, Mich.—Two four-cylinder Michigan cars: One roadster and one touring car; one four-cylinder chassis.

Motor Car Mfg. Co., Indianapolis, Ind.—Six



VIEW OF THE SINGLE ALCO EXHIBIT ON ITS RAISED DAIS ON ELEVATED PLATFORM IN THE GARDEN

Edwards Motor Car Co., New York—Two four-cylinder Edwards-Knight cars: One each limousine and touring car; one four-cylinder chassis.

Empire Automobile Co., Indianapolis, Ind.—One Empire four-cylinder touring car and one four-cylinder chassis.

F. I. A. T., Poughkeepsie, N. Y.—Five Fiat cars: One six-cylinder and two four-cylinder touring cars, one six-cylinder limousine and one four-cylinder roadster; one six-cylinder chassis.

Havers Motor Car Co., Port Huron, Mich.—Four six-cylinder Havers cars: Two roadsters, one limousine and one touring car; one six-cylinder chassis.

Henderson Motor Car Co., Indianapolis, Ind.—Four four-cylinder Henderson cars: Three touring cars and one roadster.

Herreshoff Motor Car Co., Detroit, Mich.—Two Herreshoff touring cars: One four-cylinder and one six-cylinder; one four-cylinder chassis.

Five four-cylinder Rambler cars: Two touring cars, one limousine, one sedan and one roadster; one four-cylinder chassis.

Keeton Motor Co., Detroit, Mich.—One six-cylinder Keeton touring car and one six-cylinder chassis.

King Motor Car Co., Detroit, Mich.—One four-cylinder King touring car.

Kissel Motor Car Co., Hartford, Wis.—Three Kissel cars: One four-cylinder and one six-cylinder touring car, one four-cylinder coupe; one six-cylinder chassis.

Kline Motor Corporation, York, Pa.—One five-passenger four-cylinder Kline touring car.

K. R. I. T. Motor Car Co., Detroit, Mich.—Three Krit cars: One four-cylinder and one six-cylinder touring car and one four-cylinder roadster; one four-cylinder chassis.

Lenox Motor Car Co., Boston, Mass.—Two Lenox touring cars: One four-cylinder four-cylinder Pathfinder cars: Three touring cars, two roadsters and one coupe; one four-cylinder chassis.

Norwalk Motor Car Co., Martinsburg, W. Va.—Four six-cylinder Norwalk underslung cars: Three touring cars and one roadster.

Paige-Detroit Motor Car Co., Detroit, Mich.—Four four-cylinder Paige cars: One each touring car, coupe, sedan and roadster.

W. A. Paterson Co., Flint, Mich.—Two four-cylinder Paterson touring cars.

J. I. Case T. M. Motor Co., Racine, Wis.—Four four-cylinder Case cars: Two touring cars, one roadster and one coupe; one four-cylinder chassis.

R. C. H. Corporation, Detroit, Mich.—Three four-cylinder R. C. H. cars; one roadster, one coupe and one touring car; one Hupp-Yeats electric coupe.

Regal Motor Car Co., Detroit, Mich.—Four four-cylinder Regal Underslung cars:

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Two touring cars, one roadster and one coupe; one four-cylinder chassis.

Republic Motor Co., Detroit, Mich.—Two Chevrolet six-cylinder touring cars and one six-cylinder chassis; one six-cylinder Little touring car and one six-cylinder chassis; one four-cylinder Little standard roadster.

Speedwell Motor Car Co., Dayton, O.—One six-cylinder Mead-engined Speedwell chassis; one six-cylinder touring car, poppet valve motor.

Schacht Motor Car Co., Cincinnati, O.—One four-cylinder five-passenger Schacht touring car.

Standard Electric Car Co., Jackson, Mich.—Three Standard electric cars: One runabout and two coupes; one chassis.

Studebaker Corporation, Detroit, Mich.—Five Studebaker cars: Two four-cylinder and one six-cylinder touring car, one four cylinder sedan and one six-cylinder limousine; one four-cylinder chassis.

Velie Motor Vehicle Co., Moline, Ill.—Two four-cylinder Velie touring cars and one four-cylinder chassis.

Westcott Motor Car Co., Richmond, Ind.—Three Westcott cars: One six-cylinder and one four-cylinder touring car and one four-cylinder roadster.



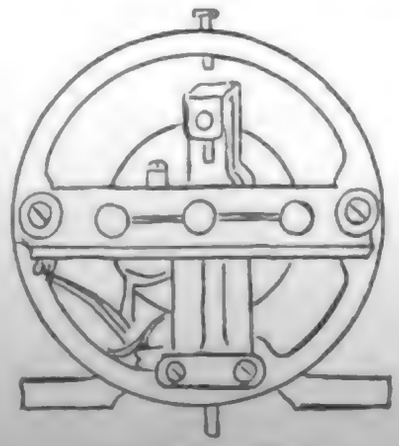
LOOKING DOWN ONE OF THE BALCONY AISLES IN THE PALACE, THE CHEVROLET EXHIBIT IN THE FOREGROUND

Unexpected Things That Cropped Up in the Accessory Department

As is always the case, much that is new, novel and unexpected cropped up in the formidable display of parts and accessories; not even the far-reaching and pains-taking efforts centered in Motor World's Before-Shows Number served to bring all of them to light; indeed, not a few of the new things in evidence are displayed by makers who did not even figure on the official list of exhibitors; they came into the show at practically the eleventh hour. There always are a number of these "eleventh hour people," but this year the number is very much larger than ever before. Even some of the large, and well-known, and well-established makers of parts and accessories apparently attached so little importance to some of their newer, and perhaps smaller but none the less interesting wares, that they said nothing about them in their advance reports. In other cases, they evidently purposely "held back" one thing or another in order to provide what may be termed a "show surprise." As a result of these several inclinations, the wealth of novelty is unusually large, even if all of it is not of absorbing interest.

Lighters and Starters.

Three almost unheralded electric lighting systems are exhibited for the first time, two of which—the Briggs, made by the Briggs Magneto Co., and the Gould, product of the Gould Storage Battery Co.—are brand new; the third is the Westinghouse system. All three are similar in that they embody the means for accomplishing ignition in the same instrument and all are electrically governed to prevent excessive voltage at high engine speeds, by means of a differential field, or bucking field, which comes into play when the voltage passes a predetermined point. In the Westinghouse instrument a cutout which disconnects the generator from the storage battery when the voltage of the latter is greater than potential at the machine terminals, is operated by a centrifugal governor; in both the Gould and the Briggs a magnetic cutout is provided. The Gould system is distinctive in that the armature is doubly wound, delivering direct current at six volts from one side and alternating current for ignition work at the other. In all three systems quick-break circuit breakers and high tension distributers are provided; in the Westinghouse the circuit breaker is fitted with two contacts.



DEAN CENTURIAN

The Splitdorflite, as the electric lighting system made by the Splitdorf Electrical Co., Newark, N. J., is called, has been remodeled and has emerged from the process with a differentially wound field by means of which

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the voltage is kept constant, regardless of the motor speed, and with commutator of such liberal proportions that sparking is prevented even when the device is short circuited and is delivering its maximum, 40 amperes. The newer device, or devices—for the Splitdorf instrument is made in two sizes—is made primarily for use at low speeds, and to this end the maximum voltage is obtained at 350 revolutions, at which point the magnetic cutout closes, connecting the generator with the battery. The device attaches to the half-time shaft of the motor.

The Vesta generator has undergone a slight change which has to do with the governing mechanism. A ring type governor which operates to close the cutout connecting the generator and the battery when the proper speed has been attained and which serves to insert a single step of resistance in the working circuit when the speed is greater than normal and so cut down the voltage, is provided instead of the ball-governor controlled rheostat which performed both services in the previous instrument. Otherwise the Vesta system is unaltered.

One of the "neat" little fixtures which has to do with the electric lighting system is shown by the Dean Electric Co., and is termed Centurian. The device is nothing more nor less than a relay which is placed in circuit with the tail lamp so that when the filament breaks or the circuit is broken at any other point, causing the rear lamp to go out, the relay closes the circuit to a telltale lamp positioned on the dashboard so that the driver is made cognizant of the fact that the rear lamp is not burning. The device is fitted into a neat case which attaches to the dash of the car and is finished in black enamel.

The General Electric Co. has brought out not a few lighting accessories, chief among which are a new series of sockets which are fully protected from the ingress of dirt and moisture and which fit snugly onto the cable and prevent straining of the wires, a new inspection lamp fitted with a parabolic reflector and a switch in the handle operated simply by rotating the handle, a new three-way switch for use on limousines so that the interior lights can be controlled from the driver's seat as well as from the interior of the car; a new portable combined volt and ammeter providing three scales for reading voltage from 3 to 150 and from .3 to 30 amperes; for use on electric vehicles, a new series of concentrated metal filament lamps has been brought out for use with voltages from 20 to 90.

In the engine starter field but little has appeared that has not been covered fully in preceding issues of Motor World. The Auto-Lite Co., Toledo, Ohio, has altered the relative positions of its units so that the starting motor now is placed with the shaft in a vertical position and operates to start the motor through the timing gear train. Otherwise the system is unaltered.



ELEVATED PLATFORM DISPLAY OF FIRESTONE TIRES AND RIMS, WITH TIMKEN PRODUCTS ADJOINING

Motors.

Of the manufacturers of motors of long standing, but three are showing. The Buda Co. has a new block-cast six-cylinder motor with a bore and stroke of 3¼ and 5½ inches, respectively, known as model SS. In common with other motors of the Buda line, it is of the L-head type with fully enclosed valve mechanism and a self-contained sight-feed oiling system. Provision is made for attaching both motor and generator units of an electric starting system, the former driving through gear teeth provided in a band shrunk on the flywheel and the latter being driven through the timing gears at 1½ times the crankshaft speed.

Two new four-cylinder motors also have been brought out, known as N and T, the former adapted for three-point suspension. Of the newer features incorporated in the design of Buda motors, the combination of Models Q, T, N and O with gearsets in unit power plant form with Buda gears and a cone clutch is probably the most important. Minor details include the provision of gear teeth, shrunk on in band form, on the flywheels, for use in connection with electric starters, a sight oil feed and the provision of chain drive from the timing gears for operation of the electric generator.

The Northway Motor & Mfg. Co., Detroit, Mich., also has produced a new "six," 4⅛ x 4¼ bore and stroke, with pair-cast cylinders and combined in unit power plant form with a three-speed selectively operated gearset. The motor is of the L-head type with enclosed valve mechanism and silent chain driven camshafts. Cooling is by pump circulation and lubrication by a self-contained system by means of which new oil from the generously proportioned reservoir is forced to each lubrication point

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CONCERT HALL IN THE GARDEN SHOWING HESS-BRIGHT EXHIBIT ON RAISED PLATFORM IN BACKGROUND

and drained to the base. The oil is not recirculated. Delco lighting, starting and ignition system is furnished with the motor.

Model 32 is a new four-cylinder motor, in other respects identical with the new "six," excepting only the camshaft drive, which is through helical gears. Save for dimensions, which are 4½ and 5¼ inches, Model 34 is identical with Model 32. Model 33 is a four-cylinder motor of similar general design but lacking the electric system and the gearset; the dimensions are 4⅛ and 4¾ inches. Provision is made for the installation of an electric starter.

Two new motors bearing the Model nameplate are shown by the Model Engine Works, Peru, Ind. One is a "six" with cylinders cast in threes, and is combined in unit power plant form with a four-speed selectively operated gearset of the "overstep" type, giving direct drive on third speed. The bore and stroke stand at 4¼ and 5½ inches, respectively, leaving little doubt as to the aptness of the term "long stroke." Valves are all on the same side and are fully enclosed; three bearings are provided in the camshaft. The other motor is dimensioned at 5½ and 7 inches, bore and stroke, respectively, and is of very heavy construction throughout, being intended primarily for tractor work.

Besides the Magic motor exhibited by the Aristos Co., New York City, and which has been treated fully in other issues of Motor World, three motors "first time out" are on view, or it might better be said two new motors and a proposed motor, for only a small sectional model and the working drawings of the Oar motor, which is to be made in Plainfield, N. J., by the Oar Motor Co., are on view. The motor is of the piston valve type with the valves operated from yoked eccentrics on the two camshafts which are provided. In themselves the valves are novel in that provision is made for cooling them without coring the valves by having them contact with water cooled surfaces both on the inside and on the outside. Only a single port is provided, through which both ingress and egress of the gases take place.

Also on view is the Lycoming-Mead rotary valve motor, made under the Mead patents by the Lycoming Foundry & Machine Co., Williamsport, Pa. The engine is a "six" with cylinders cast in threes, and differs from the Mead motor as exhibited in connection with the Speedwell car in that the rotary valves are continuous for the six cylinders instead of being divided and joined with an Oldham coupling. The valves are silent chain driven through a reducing gear directly from the crankshaft; chain and gears operate in an oil bath. Gray & Davis motor starting system is supplied with the motor, which is sparked with a Bosch dual magneto. Naturally the motor is water cooled, circulation being induced by a gear pump, and force-feed lubrication obtains.

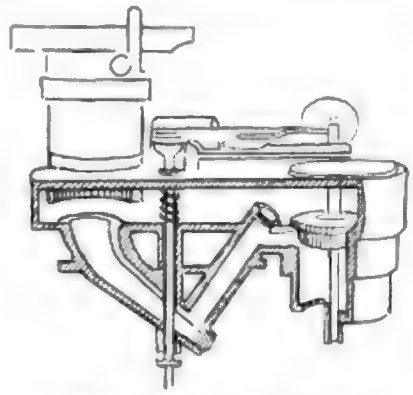
The Twostroke motor, product of the Duplex Gasolene Motor Co., New York City, is radical in design, though not in principle, right up to the point where it might be termed "freakish." Substantially the motor is a two-cycle motor with a separate compression cylinder, and for each revolution of the crankshaft each of the power cylinders delivers an impulse to the shaft, but by reason of the fact that the compression cylinder compresses the mixture straight up to the point at which it is ignited and therefore performs in full the functions of intaking and compressing while the working cylinder performs the functions of expanding and exhausting, the motor is termed "four-cycle" by the maker. One of

the interesting points in the design is the presence of single sleeve valves eccentric-operated from the crankshaft in both the compression and the working cylinders. Ignition takes place in a combustion chamber which is distinct from the working cylinder and the hot gases are precipitated into the working cylinder, where they expand, and in so doing perform their function in moving the piston. The motor is water-cooled, and by virtue of the fact that there is no difference in the appearance of the compression and the working cylinders, both being water-jacketed, a two-cylinder motor has the appearance of a four-cylinder machine.

Carburetters.

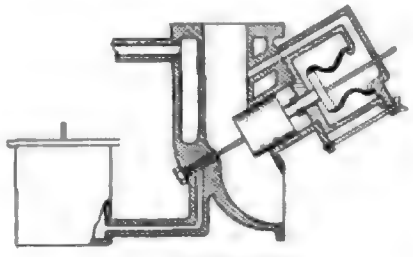
While at the first glance the problem of proving mathematically that the mixture delivered by a carburetter is constant under all conditions of motor speed and throttle opening, would seem to be a matter incapable of comprehension save by those who are versed in the use of mathematical formulæ, that such is not the case is aptly shown at the booth of the Motsinger Device Mfg. Co., of Lafayette, Ind., which, as stated in Motor World Before-Shows number, has entered the carburetter field with an instrument that was shrouded in secrecy but which it was promised would make the world "sit up." As finally disclosed, the Motsinger device is best described as a single variable jet instrument, the opening of the jet being controlled by the air inlet valve, which is of such formation—inverted dome—that the quantity of air which passes it is proportional to the lift of the valve, which is to say that if the valve is raised from its seat ¼ of an inch with the passage of a unit quantity of air, when the valve is lifted ½ an inch two volumes of air will be passed. Actuated by the air valve stem is a horizontal lever hinged at one end; a slidable contact which attaches to the needle valve stem rests on the lever. Thus it is easily seen that the lift of the needle valve stem is proportional to the lift of the air valve stem, and since the formation of the needle valve is such that the amount of gasolene delivered through the jet is proportional to the lift of the valve, not the slightest doubt can be expressed as to the constancy of the mixture. For low speeds a by-pass around the air valve is provided which takes the form of a modified venturi and in this passage the jet is located; so that this passage of air does not interfere with the constancy of the mixture, however, the opening of the needle valve when the air valve is seated, is proportioned to the amount of air passing through the by-pass.

By way of varying the proportion of gasolene and air to meet all atmospheric conditions as to temperature, barometric reading and humidity, the contact through which the needle valve stem is operated by the horizontal lever can be shifted on the lever so that the needle valve is opened a greater or a less amount for the same movement of the air valve, and a rich or a lean mixture provided and maintained throughout all operative conditions of the motor. This ad-



MOTSINGER CARBURETTER

justment, which is the only adjustment provided, is operated from the steering column through the intermediary of a Bowden wire transmission so that the quality of the mixture can be changed while the car is in operation and the very best results obtained. In other points, the design of carburetter is not so very far removed from the orthodox; the level of the fuel in the float chamber is controlled by a check valve operated by a float of more than ordinarily heavy construction, the bore through which is in the



S. U. CARBURETTER

shape of a truncated cone, and a butterfly throttle valve is employed.

On the same general type, although the end is obtained in a manner differing not a little bit from the Motsinger practice, is the SU carburetter shown at the stand of the Simms Magneto Co., Bloomfield, N. J., another manufacturer of ignition devices which has taken up the production of carburetters. The SU device, which is of British origin and is being made under exclusive rights in this country, likewise has a single variable jet the opening of which is varied according to the reduced atmospheric pressure above the jet. The needle valve stem attaches to a disk which forms the end of a bellows into which a duct leads from a point in the mixing chamber above the jet; as the atmospheric pressure in the mixing chamber is reduced, the air is exhausted from the bellows, which naturally collapses, lifting the disk and the needle valve, increasing the supply of fuel. Since the atmpospheric pressure is dependent upon the speed of the motor, constancy of mixture is obtained.

Of the very many other carburetters exhibited, the Homo, produced by the Homo Co. of America, Philadelphia, Pa., and the Sunderman, made by the Sunderman Safety Carburetter Co. of Newburgh, N. Y., though neither is new in the strictest interpretation of the term, are novel in that a mixer which is calculated to break up all the particles of liquid fuel before the mixture enters the manifold, is incorporated in the body of the instrument. In the Sunderman device the mixer comprises nothing more complicated than a perforated plate through which the mixture is drawn to the elimination of the globules; in the Homo instrument the mixer takes the form of a perfectly balanced and extremely light fan wheel, the blades and periphery of which are perforated. The motion of the gases through the carburetter sets the fan wheel in motion and the particles of liquid fuel are broken up to the production of a homogenious mixture. In other respects neither of the carburetters is radical.

Transmissions.

In addition to the axles enumerated in the Before-Shows number is a development which, while not essentially new in the trade, is new for the American Ball Bearing Co., of Cleveland, O. It is of the worm type and is designed for use in 1-ton trucks, with 50 per cent. overload, and uses Lanchester Daimler annular and ball bearings. Another new product by this company is a pressed steel, bevel drive axle with an inserted driving unit and rear inspection plate. It was brought out to complete a series of three, the building of which the company commenced some time ago.

Two gearsets just developed are displayed by the Muncie Gear Works, of Muncie, Ind., one a four-speed, the other a three-speed, and both selective sliding. A feature of both is that the removal of a plate on the side of the case permits the removal of the reverse gear and the substitution of a new one without the tearing down of the whole mechanism—a desirable device, since the reverse gear is much worked. Control levers are located over the center of the boxes and the gears have teeth of graduated widths, the faces widening by an eighth of an inch each as the sizes increase.

An unusual feature of the mechanism is

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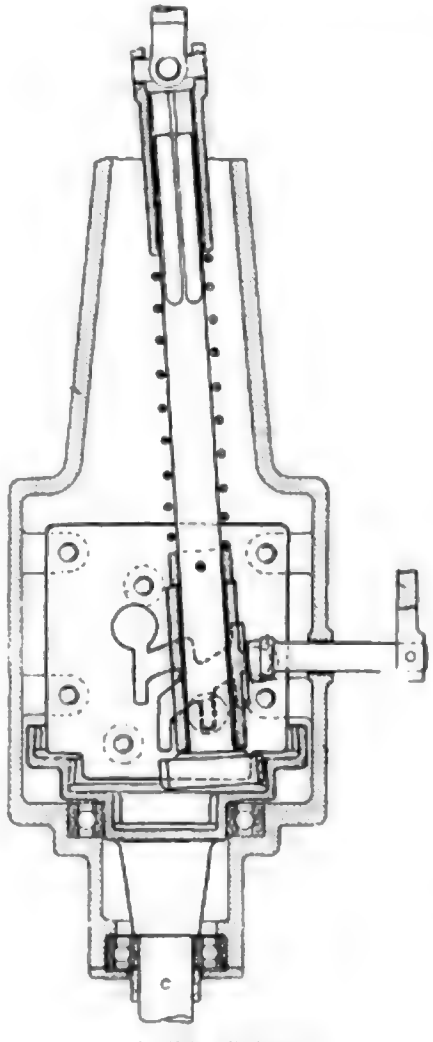
that the four-speed transmission may be assembled with direct drive on high or third, and the unit is given a wide range of adaptability in that, while the shift lever is always in the center of the car, the other controls may be arranged for right or left drive. The pedals may be placed at right or left merely by changing the location of the pedal shaft and the brake lever is changeable likewise. The transmission is designed to fit any standard motor.

The clutch is of steel and Raybestos, sections of the Raybestos rings being removed with the object of permitting the clutch to run wet or dry; the operator does not have to worry lest oil leak into the clutch case, neither lest it become dry, as might be the case were the clutch of the wet or dry type. A central spiral spring is contained within the center of the clutch, and when the clutch pedal is pushed a clutch brake tends to stop movement of this part. The company also shows a jackshaft.

Flanking the Magic motor, which is really the Swiss Fisher motor with a new name formed of the initials of the company formed to exploit it in America—Motor and Gear Improvement Co.—and which is distinctive by reason of its sliding crescent valves, there is a brand new gearset that is radically different from anything else of its kind; its appearance with the Magic motor makes plain the meaning of the phrase "gear improvement" in the title of the company which will exploit both, the one having been developed to go with the other.

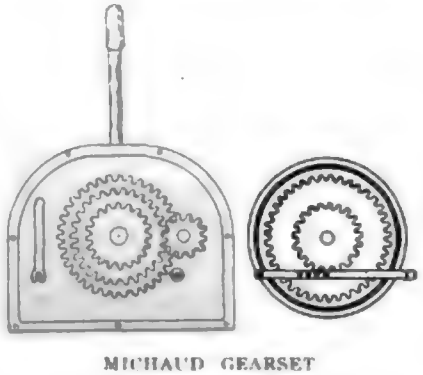
In its simplest aspect, the Fisher gearset is an arrangement of internal gears in which various speed changes are selectively obtained. The driving gear is connected to the clutch shaft through the intermediary of a universal joint, the other end of the shaft being supported in a ball-bearing mounted shifting block. For high gear, the main driving gear simply is meshed with gearing cut in the center of the driven member, the two then operating as a positive clutch with no gears in operation. The other speeds, first and second, are obtained by progressively bringing the driving gear into mesh with the several internal gear rings in the driven member. For the reverse drive, a small pinion is inserted between the main driving gear and the driven member. The shifting is facilitated by a guide plate housed in the case, which also serves to lock the gears in mesh.

What is hailed as the successor to the type of gearset which incorporates a lay shaft in its makeup, is a four-speed gearset exhibited by J. O. Michaud, of Fort Kent, Me. The device comprises a three-step cone gear which attaches to the clutch shaft and a large internal gear which is designed to mesh in turn with each of the three steps on the cone gear; direct drive, which is on the fourth speed, is obtained by inserting the smaller of the stepped gears in



MAGIC GEARSET

a similarly shaped recess in the back plate of the internal gear. The internal gear naturally is made to shift in a plane parallel with the clutch shaft and in another plane



MICHAUD GEARSET

at right angles with it, so as to mesh with all of the gears, and for this reason the propeller shaft is fitted with a universal and a slip joint; reverse is obtained by the use of an idler pinion.

As for axles, new types and new sizes of older types have been brought out by nearly all of the parts manufacturers who produce axles, but nothing that is startling appeared. The Timken-Detroit Axle Co. has brought out both front and rear axles for use on cars powered between 30 and 35, 40 and 45 and 50 and 60 horsepower, respectively, and two types of worm driven axles for use with pleasure cars weighing up to 3,400 and up to 4,500 pounds, respectively, in which David Brown worms are employed and disposed either under or over the axle, as preferred. In the front axles Timken bearings are supplied in the steering knuckle bearings.

The McCue Co. has on view a new rear axle and gearset assembly for use on 1½-ton commercial vehicles, the axle housing being of the well known McCue pressed steel type. Three speeds and reverse are provided by the gearset, which is selectively operated. The Lefevre Arms Co. also has on view a unit rear axle and gearset assembly for use on cars powered between 35 and 40 horsepower; three speeds and reverse are provided.

The Hess Spring & Axle Co. David Brown worm driven axle, for use on pleasure cars, the worm being overhung. Outside of the employment of the worm, the axle is similar to other Hess axles.

Lanchester-Daimler worms finished and fitted with differential gears are on view at the booth of the Warner Gear Co., which also is showing a new gearset in unit power plant form designed to attach to any make of motor and which can be fitted with the Gardner spring starter. The latter attaches to the multiple disk clutch which is fitted tnd turns the motor over upon the release of a stop. The spring is rewound by the inertia of the car. The new gearset, which is designed for four speeds and reverse, selectively operated, is made in three sizes and is designed for center control.

Rims and Wheels.

In the matter of wheel equipment, but little has appeared that was not described in Motor World's Before-Shows number. One new demountable rim cropped up, however, the product of the Presto Inter-Rim Co., of Boston, Mass., which comprises a felloe band provided with a flange at the rear and designed to position the demountable rim which bears the tire, and with a channel at the front end into which fits a split lock ring. The lock ring is provided with two lugs, one on either side of the split, which are gripped and locked firmly in place by a toggle lever lock which attaches to the wheel felloe. The toggle lever is sufficiently long to render the locking operation a very simple matter. A quick-detachable rim made by the National Rim Co., Tarrytown,

N. Y., also is shown. It comprises a continuous lock ring which is held in place by lugs caused to protrude through holes in the felloe by flat steel springs to which they are attached. When the lock ring is to be removed the lugs are withdrawn and held out of engagement by slightly turning the springs on the single rivet which holds them to the felloe so that the lugs are out of line with the holes.

Not a little interest attaches to the dual wood wheel which is part of the display of Phineas Jones & So., Newark, N. J., and which comprises two separate felloes and sets of spokes, both mounted on a single hub. The wheel is intended primarily for use on commercial vehicles. Cast steel wheels are very much in evidence and are shown not only by the Sheldon Axle Co., but by the Timken-Detroit Axle Co., Peter Frasse & Co., New York City, who handle the electric furnace products of the George Fischer Co of Schaffhausen, Switzerland, and by the George Fischer Steel & Iron Works, Ltd., also of Schaffhausen, but a separate concern, whose products are made by the orthodox process and not in the electric furnace. In both cases the spokes of the wheels are cast hollow by way of reducing weight It scarcely would be an exhibit worth the name if the spring wheel were not on hand in one or more of its over 13,000 forms. As made by the American Spring Wheel Co., the Seaton wheel takes the form of an unyieldable rubber tired rim attached to the wheel felloe through the intermediary of helical springs — parallel with the axle—supported by a pair of brackets, one on the felloe and the other on the rim. The brackets alternate on both the rim and felloe, one being placed on the inside and the next on the outside, and the springs are attached through ball and socket joints. Thrust naturally throws the springs at an angle with the axle and all of the springs are slightly distended to bear the load.

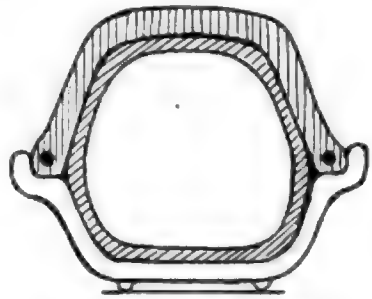
Both McCue and Rudge-Whitworth wire wheels are in evidence, the former at the booth of the McCue Co., Buffalo, and the latter by the Standard Roller Bearing Co., which manufactures the wheels for the Geo. W. Houk Co., Philadelphia, Pa. The wheels are fitted with Houk quick-detachable rims. McCue wheels have been altered in that the lacing now is tangent to the hub, by virtue of which a greater resiliency is obtained, and by the fitting of the newer types of McCue rims. A non-demountable wire wheel for use in connection with Ford cars also has been produced by the McCue Co.

Mott wire wheels, or, better, a Mott wire wheel, for the manufacture just has been taken up, is on display at the stand of the Timken-Detroit Axle Co. It is of the radially laced type, and the feature is the simplicity of the demounting mechanism, for the wheel can be detached simply by depressing a push button mounted in the center of the hub. Also displayed at the Timken stand is the Timken cast steel hollow spoke wheel, which is to be made in all of the more common sizes for truck use, and of course the new worms and worm axle.

A brand new addition to the line of Stanweld rims, made by the Standard Welding Co., Cleveland, Ohio, is the rim for use on wire wheels. By virtue of a pair of channels formed in the rim proper, the heads of the spokes are recessed without the necessity for countersinking and the channels, moreover, contribute considerably to the strength and rigidity of the rim. In other respects the rim is similar to the rims used on wood wheels.

Tires.

While all of the many near non-skid treads forecast in the Before-Shows number of Motor World put in an appearance at the show, and also those innovations, the



GOODYEAR-M'NALL TIRE

Overman and Favary tires, and a number of spring wheels, two entirely new and almost radical types of tire cropped out in an unexpected and prominent quarter — in the Goodyear exhibit. They are displayed in the somewhat reluctant manner in which several now prominent articles first made their appearance at shows, the manner indicating caution. The two new Goodyears—the McNall and the Three-Piece Goodyear—are, however, in a more or less experimental stage.

The McNall tire is named after an Akron man who designed it and differs essentially from accepted construction. It consists of two parts, an iron base and a rubber tread. The base consists of a deep channel section, at the upper edges of the sides being a seat to take the edge of the tread. The tread is similar in shape to an ordinary pneumatic tread cut off midway between the rim and the outer circumference of the tire. The beads, which, however, are not held by any clincher device, contain several strands of wire which hold the edges of the tire tightly to the seats, as is shown in the accompanying illustration. A regulation inner tube is used.

The Three-Piece Goodyear tire is all that its designation implies. The first part is the inner tube, which is of regular construction; the second part is practically an ordinary casing minus a tread, and the third part is a tread or tire protector. The tread fits onto the carcass, the carcass fits onto the rim, and the inner tube occupies its regular position. The tread and carcass are not vulcanized together and remain in position through the shape in which they are built; the carcass retains its position as does any casing, and the tread, fitting tightly and snugly about the carcass, is secured by that means. Efficiency and durability were objects in the construction of these types. A feature of the Three-Piece is that when one part—the tread, for instance—is worn out an entire new casing is not required.

A red inner tube has been developed by the United States Tire Co. and is made a feature of its exhibit; added quality, because of the red rubber, is claimed. Among the other tires and supplementary products not ready for announcement in the Before-Shows number but brought out at the show are:

Miller red inner tubes, shown by the Miller Rubber Co., of Akron, O. Red rubber, for which high quality is claimed, is used.

Interlock tires, manufactured by the United & Globe Mfg. Cos., of Trenton, N. J. These have been manufactured for some time for the Australian trade, but only now are being supplied to the home market. They are constructed of crossed duck strips, hand stitched and attached to the bead without the means of wire or metal. It is said that it takes as long to build one Interlock tire as it does to build ten ordinary tires, because of the hand labor, and that therefore the cost is about 25 per cent greater.

Reason inner tires, displayed by the Perfect Tire Sales Co., of Philadelphia. These consist of a shoe-like inner tire which fits between the tube and the casing and is guaranteed for 15,000 miles. The inner tire, itself, is of two surfaces spaced by rubber block supports; the edges meet at the bottom of the tire, forming a round cavity for a special inner tube which is furnished.

Ignition Devices.

"Newness" in the field of ignition devices is for the better part evidenced in the production of unit spark ignition systems for use in connection with electric lighting and starting systems, making the use of a magneto superfluous. Besides the Atwater Kent Unisparker and the Rhodes Unit Spark systems, which were treated in the Motor World Before-Shows Issue, five "hot off the iron" quick-break systems have made their appearance, of which four—the

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Briggs, made by the Briggs Magneto Co.; the Duplex, product of the Gould Storage Battery Co.; the Westinghouse, of the Westinghouse Electric & Mfg. Co., and the Esterline, introduced by the Esterline Co.—are integral with the electric lighting systems; the fifth, fathered by the Connecticut Telephone & Electric Co., is put out as a unit for attachment to any lighting system or for use in connection with battery ignition.

In the matter of magnetos, two new Splitdorf instruments have made their appearance, and, unlike previous Splitdorf instruments, they are of the high-tension type, styled models EU 4 and EU 6, for use in connection with four- and six-cylinder motors, respectively. The instruments are fully enclosed by way of rendering them impervious to water, oil or dust and pockets and corners which are calculated to catch dirt have been eliminated insofar as is possible, to the better and cleaner cut appearance of the devices. Compactness and accessibility are cardinal features, the instruments being no larger than the motorcycle instrument, save only for the distributer blocks. The magnetos are designed to deliver a hot spark at low speeds, and in order to reduce the noise and the wear attendant upon the action of the circuit breaker to minimum, the parts have been made very light.

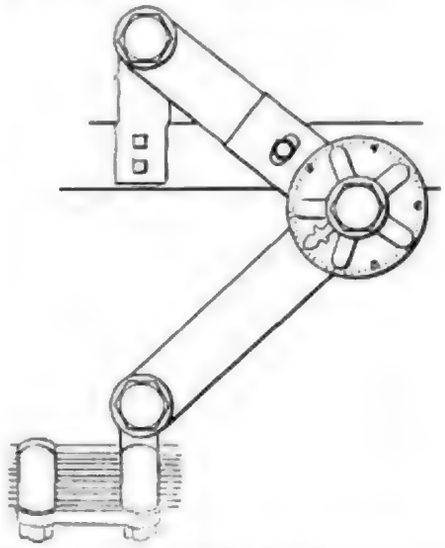
Outside of the new Herz and Simms instruments, which were treated in Motor World Before-Shows number, nothing save a few minor improvements have been made in magneto products. The National, K-W, Pittsfield, Heinze and Connecticut instruments are exhibited.

A synchronized battery ignition system which embraces the use of a master vibrator through which a spark is delivered to each of the cylinders when the motor first is started, and a quick break for use when the motor is running at speed with a consequent saving in current consumption, is displayed by the Western Electric Co., maker of Pittsfield products.

A new priming spark plug for use with Ford cars is displayed by the Heinze Electric Co., and differs from other priming plugs in that the priming cup itself forms the terminal for the connection of the ignition wire.

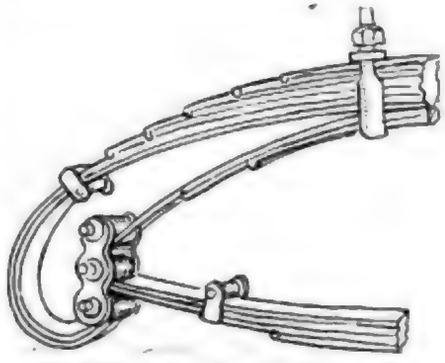
Shock Absorbers.

By way of rendering the device equally efficient, whether used on cars with stiff springs or on cars with springs that are very resilient, the Hartford Suspension Co., Jersey City, N. J., has "revised" the Truffault-Hartford shock absorber, of which revision nothing had been said. In its newest aspect the device embraces the use of three frictional arms, one of which is at all times operative and functions when the movement of the springs is but slight. A second and shorter arm is feathered to the longer arm and comes into play, doubling the friction, when the movement of the springs increases, so that the pin on the longer lever reaches the end of the slot in which it works on the second lever. The third arm is provided with a still longer slot and comes into play, trebling the friction when the spring movement is abnormal.



TRUFFAULT-HARTFORD SHOCK ABSORBER

Also new at the Hartford stand is an unheralded rear-end bumper designed for attachment to cars with scroll springs. The device clamps directly onto the scroll and makes use of the resiliency of the car springs, as well as the resiliency of a single leaf spring under the clamp to break the force of blows imparted to the bar.



ANDREW SCOMPENSATING SPRING

Derhion shock absorbers, which are of foreign manufacture, are exhibited by H. A. Elliott, Detroit. In their simplest aspect they comprise a cylinder in which a vane is caused to reciprocate by the action of the spring. A barrier provided with a by-pass is placed across the lower portion of the cylinder and fits snugly up against the hub on which the vane is fastened. Mounted loosely on the same shaft and caused to operate by engagement with lugs on the reciprocating vane is a second vane, the blades of which are at a slight angle, so that there is slight lost motion. Both vanes fit up snugly to the cylinder walls at the top of the cylinder, but at the bottom there is sufficient space for the free passage of the glycerine with which the cylinder is filled. In action, the spring is free to move in either direction, until the vane is in such position at the top of the cylinder that passage of the liquid is prevented save through the by-pass, which naturally is slow, and the movement of the spring gradually is checked.

Other shock absorbers, or, better called shock absorbing springs, are on view, the Clarence H. Peacock Co., of New York City, exhibiting Ames springs, designed to be placed over the lower leaf spring and act against its movement; the Huston Multiple Spring Co., which comprises a scroll spring with the leaves of the scroll separated and attached to different shackles attaching at two points to the lower leaf spring, which construction, it is claimed, dampens the recoil, and by the Sheldon Axle Co., which has on display the Andrews compensating device, which is a triple spring, each of the three members being so connected to the shackle that excessive motion is prevented.

Some slight improvements in the shape of a larger casing, the elimination of rivets for attaching the belt and a slightly different shape of compression member have been made in the Gabriel rebound snubber: Connecticut improvements comprise the fitting of an adjustment for changing the tension of the springs for various weight cars.

Lamps.

In lamps there have been a few developments since the Before-Shows number, as follows:

A disappearing lamp for limousine service, perfected but a few days before the opening of the show by C. Cowles & Co., of New Haven, Conn. It consists of a small lamp in a nickeled case, one side of which is open, and which revolves. When the "light" button is pressed the open side turns outward and lamp lights. The "dark" button extinguishes the lamp and causes a neat metal door to fit into the stationary metal frame work which is set into the limousine wall. This company's former disappearing lamps were less attractive and operated with a lever.

A true parabolic reflector shown by the Badger Brass Mfg. Co., of Kenosha, Wis. Highest efficiency is claimed for this reflector because of its mathematically correct shape.

A "Golden Glow" paraboloic reflector lamp made by the Esterline Co. of Lafay-

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ette, Ind., which has a green reflector and throws a soft green light, not hurtful to the eyes; made in 7 to 11 inch sizes.

A headlight deflector made by the Brown Co., of Syracuse, N. Y. This consists of a series of half rings, shaped much like a section of melon rind, and which fold together at the top of the front of the lamp and drop down over the upper part of the front, cutting off half the light.

Pumps.

Since the old and the new products in the pump line were heralded in Motor World's Before-Shows Number, new things have come to the surface; the new articles include:

A swinging-arm, hydraulic-pressure pump, made by the Hydraulic Oil Storage & Engineering Co., of New York City; this has an overhead arm eight feet long with eight feet of hose at the outer end permitting the gasolene tanks of cars to be filled within a radius of 16 feet of the upright pipe at the center. Pumping is effected by forcing water, under city pressure, up into the bottom of the gasolene tank beneath the fuel. The two forms of meter are provided, one which may be set to permit the flow of a certain quantity, the other which merely registers whatever flows.

An enclosed sidewalk pump brought out by the American Oil Tank & Pump Co., of Dayton, Ohio, O., which consists of an upright metal pipe passing through the sidewalk and a case at the top in which may be locked the filler hose and pumping mechanism.

A quick-detachable spark plug pump shown by the Brown Co., of Syracuse, N. Y. With each pump is furnished a two-piece spark plug, the base screwing into the plug hole as usual but the remainder of the plug being removable by a partial turn. It is held in place by pins and slots. By removing the removable part of the plug the pump can be inserted in its place.

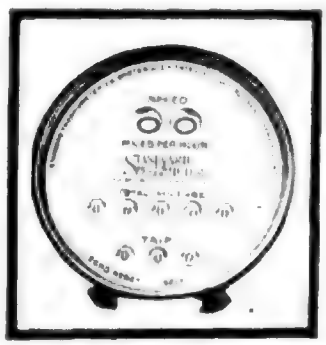
The Goodyear Tire & Rubber Co. is marketing the Folberth power tire pump; the pump is screwed into a hole drilled in a plug in the cylinder head and power is furnished by the piston rod of the pump, which projects into the cylinder and rests upon the piston head of the motor. The operation of the motor works the pump.

Tops.

The tops of which the features were described in the Before-Shows number have been increased in number by one, made by the Pantasote Co., of New York City. It is of the quick-collapsible, one-man type; the breaking of elbow braces in front of each front bow, and near the top, causes all other joints along the sides to break, and the top may be pushed back and folded by one man. Of bows there are but three on a side, one in front and two at the rear. Before breaking the braces, however, the operator is required to loosen the lower ends of the front bows. This is accomplished by unscrewing a screw with a winged nut head which, on each bow, is toward the front seat, where it easily can be reached. The feature of this screw is that it cannot fall out of the bow and is ready in place when it is desired to attach the front bow in its resting place at the base of the rear bows.

Speedometers.

Unannounced and out of the ordinary, yet in full keeping with the recent progressive policy of the manufacturer, whereby the whole line of instruments was revised and considerably improved and increased,



STANDARD DOUBLE READING METER

are the Hoffacker speedometers with ornamental dials. The instruments are combination models—Waltham timepieces—on which the dial frames have been made hexagonal, in one case, and slightly more ornate in another, and with pleasing effect. Metal work in both cases is blackened.

Not ready at the time of the Before-Shows number was a double-reading speed scale exhibited by the Standard Thermometer Co., of Philadelhia, Pa. Features of this, which has been used in certain forms on mileage registering devices, are a zero reset and selective set. The former is a button at the bottom and left of the face which turns the numbers of the trip mileage back to zero, when the gears attached to the button are thrown out of mesh and the reading does not go back of zero; in some instruments the gears remain in mesh and the figures turn backward to 99.9 and downward.

The selective re-set is utilized when a driver, who is traveling with a road book and map, desires to have his trip meter register with the mile posts; a few turns of the button suffice to set the mileage with the reading on any milepost, after which the trip reading should correspond with the book. The speed is indicated by a pair of figures in holes in the upper half of the face; the total mileage reading is up to 100,000.

Bearings and Metals.

Since the Before-Shows issue several manufacturers have brought to light improvements in their products, as follows:

Barthel, Daly & Miller, of New York City, importers of Schafer bearings, who exhibit a self-aligning bearing designed to allow for irregular running of the borne part.

Rhineland Machine Works, of New York City, which has a bearing the construction of which allows for deviation in a shaft, especially a long hung shaft of a garage or machine shop. It consists of an inner race, balls, an outer race, the outer surface of which is a section of a sphere and an outer ring whose inner surface is a section of a hollow sphere fitting the outer surface of the outer race.

The Merchant & Evans Co., of Philadelphia, Pa., which has compounded what it terms an S. A. E. phosphor bronze bearing metal. Also several parts in the company's clutch have been made of pressed steel, thereby eliminating weight and increasing compactness. A new product is an alignment joint, which allows for a total of 8 degrees and is suitable for work in close spaces.

The A. C. Smith Co. of Milwaukee, Wis., which has commenced to manufacture the Whitney roller bearing, of the adjustable tapered cup and cone type.

Frank Mossberg & Co., Attleboro, Mass., line of socket wrenches, feature of which is lightness. Also have a ratchet handle which has a long guarantee against breakage.

Allen Wrench & Tool Co., of Providence, R. I. Line of socket wrenches in which ratchet is replaced by handle in which end of handle binds against turning part of wrench and grips through friction, eliminating pawl and teeth. The Allen friction drill is similar in operation.

Locks.

The list of safety devices in the Before-Shows Issue has been augmented by several additions, among which are two combination locks. The additions are:

A knob combination lock displayed by the Ajax Trunk & Sample Case Co., of New York City, consisting of an ordinary type of safe lock attached to a dust and waterproof trunk; necessity of keys is eliminated.

A similar lock on tool boxes made by the Globe Machine & Stamping Co., of Cleveland, O. Two new boxes have been designed for Ford cards.

The "Slyco" tire holder and lock, manufactured by the Sly Mfg. Co., of Cleveland, O., and shown by Smalley Daniels of Detroit, Mich. The tire is locked into a metal

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holder by a hasp and snap lock and is removed only when a key is used.

Another Sly product, known as the "Slyco" car lock, consisting of a door to a case containing the ignition dash switch plug, a lock on the door and a key. When the plug is removed and the door locked ignition cannot be effected.

Horns.

Horns, of which the Before-Shows Issue described the Klaxon, Tuto, Rexo, Newtone, Long, Jericho, Jubilee, Monoplex, Riley-Klotz, Gabriel and Nonpareil types, have been supplemented by three others. They are:

Electra, shown by the Automobile Supply Mfg. Co., of Brooklyn, N. Y. Of the vibrator type and operates on one-half ampere. Price $4.

Sparton, displayed by the Sparks-Withington Co. of Jackson, Mich. Of the motor type, in two models. Also a combination motor and reed type.

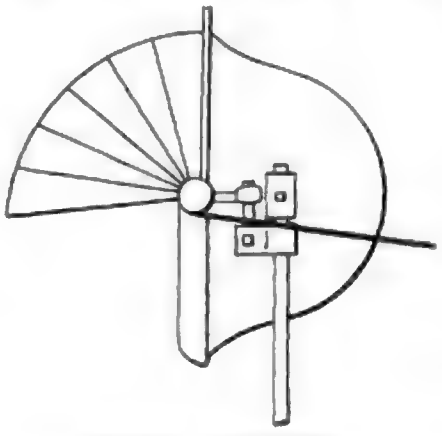
Clero, exhibited by the Fitzgerald Mfg. Co., of Torrington, Conn. Of the vibrator type, hammer tapping against a steel diaphragm.

New Accessories which Cropped up.

Pyrene fire extinguisher carrying bracket, for automobile dashboard use, made by the Pyrene Mfg. Co., of New York City. Instead of lifting the extinguisher upward and so out of the retaining bracket, it is held at the top by a spring clamp and at the bottom by a concaved cup which permits the extinguisher to be removed by a pull at right angles to the dash. The extinguisher also now is made in a two-piece shell.

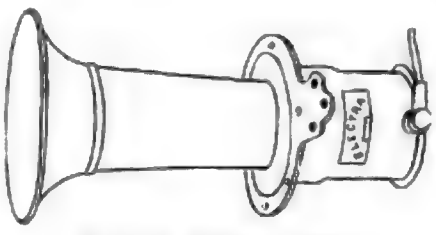
A ventilator, exhibited by Charles Cowles both demonstrated by the International Metal Polish Co., of New York City. The former is an internally applied cement.

New designs in mirrorscopes, tire holders, pedals and gauges by the Emil Grossman Co., of New York City.



B'CO RAY DEFLECTOR

The Neal shovel, manufactured by the B. B. Neal Hardware Co. of New York City



ELECTRA SIGNAL HORN

and displayed by the Perfecto Wind Deflector Co., which may be taken apart and stored in the tool box until needed to shovel snow, sand or any other impeding substance. Its overall length is 29 inches three holes through which the rope is passed and made to hold itself in a loop by an end tucked under the rope between two holes.

Turner hot-blast torch, exhibited by the Turner Brass Works, of Sycamore, Ill. An improved construction of an under-generator burner produces a hot flame and affords efficiency under extremes of weather. The torch is equipped with an improved automatic check valve. Made in quart and pint sizes. The Turner Tubular Torch operates like an ordinary gasolene blow torch but is capable of producing more heat. It is of 2-inch brass tubing five feet long and has a capacity for three quarts.

Spring leaf lubricaotr, exhibited by Chas. E. Miller of New York City. This is a small tool which is attachable to any leaf spring, forcing the leaves apart for the purpose of lubrication.

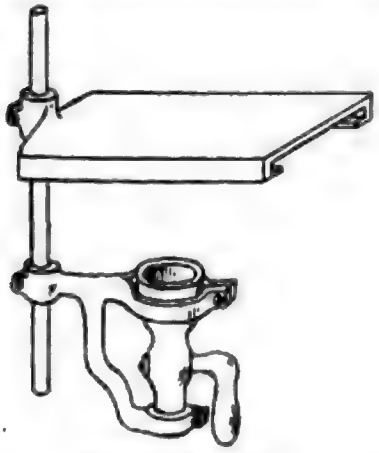
Of the very many bumpers which are on view, probably none is more interesting than the Improved Universal, produced by the Polson Mfg. Co., Buffalo, N. Y., in the design of which the use of a double bar is distinctly new. The device is of the clamp-on type designed to fit most of the cars on the market and embraces the use of helical springs enclosed in telescoping tubes. Exhibited by the same manufacturer is a windshield designed for use on roadsters. The lower edge of the bottom glass—it is a rain-vision shield—is cut to fit the curve of the dash, eliminating the filler board as ordinarily supplied. In other respects the shield is very similar to the well-known Polson line.

Among the other new devices which have cropped out is the Rich Tungsten valve, product of the Rich Tool Co., Chicago, Ill., which, as the name would imply, is formed

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dle through the intermediary of a universal joint, so that the handle can be held at any angle. A novelty is the extension base which permits the height of the base to be increased by four inches and the crown wheel clutch by means of which the worm attaches to the pinion and which permits the jack to be raised or lowered without resorting to the use of the handle.

For testing the quality of lubricating oil, as well as for determining if the correct amounts are being supplied to the cylinders, a neat little device has been brought out by the Texas Oil Co. It embraces the use of a bracket designed to hold a card over the opening in a pet cock which enters the cylinder. The bracket is adjustable for varying the distance between the card and the orifice. The quantity as well as the quality of oil can be judged by the imprint on the card after the petcock has been opened with



TEXACO OIL TESTER

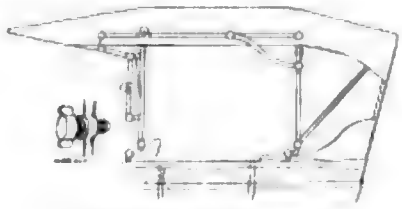
the motor in operation, after a little experience on the part of the operator.

Instruments for testing and recording the temperature of the furnaces used in the heat treatment of steel are shown in a variety of forms by the Leeds & Northrop Co., Philadelphia, Pa.

Although a multitude of dial and pencil tire gauges were listed in the Before-Shows Issue, a new one was shown; the maker is the Improved Gauge Mfg. Co., of Syracuse, N. Y., and the gauge claims as its feature that while it is of the dial type it retails at $1.

Every show serves to bring out certain articles which attract attention because of their difference and peculiarity, and some survive and become factors in the trade, while others are never seen again. Since the Before-Shows number several such have appeared, and among them are:

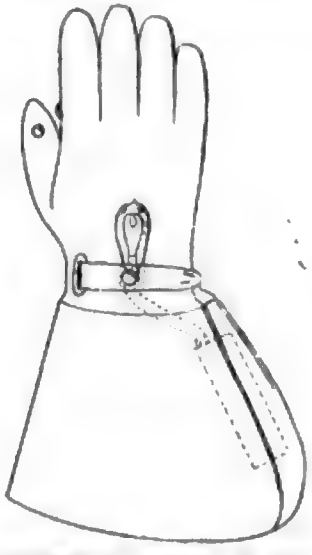
An automatic signal for chauffeurs and passengers, exploited by Charles A. Schindler, of West Hoboken, N. J. The signal device consists of a small red lamp attached to the back of a glove with a small battery in the lower side of the gauntlet; touching the thumb and forefinger brings two copper buttons into contact and the light lights, the chauffeur at the same time extending his hand out from the side of the car to warn following drivers of a turn or stop. In daylight a glove is used on which a small bell takes the place of the lamp. Prices range from $6 to $30 per pair.



PANTASOTE "ONE-MAN" TOP

The glove may be connected with a battery in the car, and the device is also recommended by the makers to those passengers who are in the habit of assisting the chauffeur in signaling cars which are following.

A headlight glare remover, demonstrated by William L. Tobey, of East Boston, Mass.



SCHINDLER SIGNAL GLOVE

This consists of a disk of amber-colored glass, about five inches in diameter, attached to a clamp and supporting rod which attach to the top or side of the windshield or some other part of the car. The device is adjustable to suit the driver and comes into play when the glare of approaching headlights tends to blind the driver, he shifting the position of his head so that the disk is between the lights and his eyes.

A "Button Bulb" for operating either an electric or reed horn, or both, manufactured by the Riley-Klotz Mfg. Co., of Newark, N. J. This consists of a button set into the top of a horn bulb, electrical contacts inside the bulb, wires running to the electric horn and an air tube to the reed horn. Pressing the button on the top of the bulb operates the electric horn, squeezing the bulb blows the reed horn.

Summary of Accessory Exhibits.

*Palace.

**Both Garden and Palace.

†Remain for next week.

Aermore Mfg. Co., Chicago, Ill.—Aermore Exhaust horns.

Adams & Westlake Co., Chicago, Ill.—Adlake electric lighting system.

Ajax-Grieb Rubber Co., New York City—Ajax tires.†

Ajax Trunk and Sample Case Co., New York City—Trunks and bags.



ALLEN FRICTION TOOLS

Alexander Mfg. Co., J., New York City—Jaco electric signals, mirrors and brass fittings.*

Allen Wrench & Tool Co., Providence, R. I.—Allen friction wrenches.

American Ball Bearing Co., Cleveland, Ohio—American axles and worm gearing.†

American Bronze Co., Berwyn, Pa.—Non-Gran bearing metal.

American Ever Ready Co., New York City—Batteries, lamps and spring starters.

American Hardware Corp., New Britain, Conn.—Corbin-Brown speedometers.*

American Metal Hose Co., Waterbury, Conn.—Flexible metal exhaust pipe, pump and lamp connections.*†

American Tire & Rubber Co., Akron, Ohio—American inner tubes.*†

American Oil Tank & Pump Co., New York City—American fuel pumps and storage systems.

American Taximeter Co., New York City—Jones and Popp taximeters and Speedograph truck recorders.†

Aristos Co., New York City—Magic motors and transmissions, Mondex shock absorbers and Mondex-Helix mixers.

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Arnold, N. B., Brooklyn, N. Y.—Slikup cleaning specialties.

Asbestos & Rubber Works of America, Brooklyn, N. Y.—Motobestos and Ajax brake linings.

Ashley, James, New York City—Portable garages.

Automobile Supply Mfg. Co., Brooklyn, N. Y.—Newtone signals and Rubes horns.†

Badger Brass Mfg. Co., Kenosha, Wis.—Solar lamps.†

F. A. Baker, New York City—Motorcycle sundries.

Baker Rim Co., New York City—Baker rims.

Braender Rubber & Tire Co., Rutherford, N. J.—Braender tires.†

Briggs Magneto Co., Elkhart, Ind.—Briggs magnetos and lighting systems.†

Brown Co., Syracuse, N. Y.—B'Co. pumps and specialties.

Brown-Lipe Gear Co., Syracuse, N. Y.—Brown-Lipe gears and gearsets.†

Buda Co., Harvey, Ill.—Buda motors and gearsets.*†

Budd Mfg. Co., Edward G., Philadelphia, Pa.—Pressed steel bodies.

Buffalo Specialty Co., Buffalo, N. Y.—Puncture sealers.

Burke Valve Co., Cleveland, Ohio—Valves and fittings.*

Coes Wrench Co., Worcester, Mass.—Wrenches.†

Colorado Tire & Leather Co., Chicago, Ill.—Durable tire treads.

Columbia Lubricants Co., New York City—Monogram lubricants.

Columbia Nut & Bolt Co., Bridgeport, Conn.—Lock nuts and bolts.†

Connecticut Telephone & Electric Co., Meriden, Conn.—Connecticut shock absorbers, magnetos and ignition devices.†

Continental Rubber Works Co., Erie, Pa.—Continental tires.*

Cooks Sons, Adam, New York City—Albany grease and lubricating oils.†



ROYAL EQUIPMENT EXHIBIT IN GARDEN



HOW HARTFORD PRODUCTS ARE SHOWN

Baldwin Chain & Mfg. Co., Worcester, Byrne, Kingston & Co., Kokomo, Ind.— Cotta Transmission Co., Rockford, Ill.—



FISK TIRE DISPLAY ON ELEVATED PLATFORM IN GARDEN

Diamond Rubber Co., Akron, Ohio—Diamond tires.†

Dixon Crucible Co., Jos., Jersey City, N. J.—Graphite lubricants.†

Doehler Die Casting Co., Brooklyn, N. Y.—Die cast parts.

Double Fabric Tire Co., Auburn, Ind.—Tires and inner tubes.

Dover Stamping & Mfg. Co., Cambridge, Mass.—Drip pans, funnels and sheet metal goods.

Duplex Gasolene Motor Co., New York City—Twostroke motors.

Dykes Co., John L., Chicago, Ill.—Tire protectors.

Eavenson Sons., Inc., J., Camden, N. J.—Jesco soaps and polishes.*

Eclipse Machine Co., Elmira, N. Y.—Motorcycle fittings.*

Edelman & Co., E., Chicago, Ill.—Tire gauges, valves, etc.

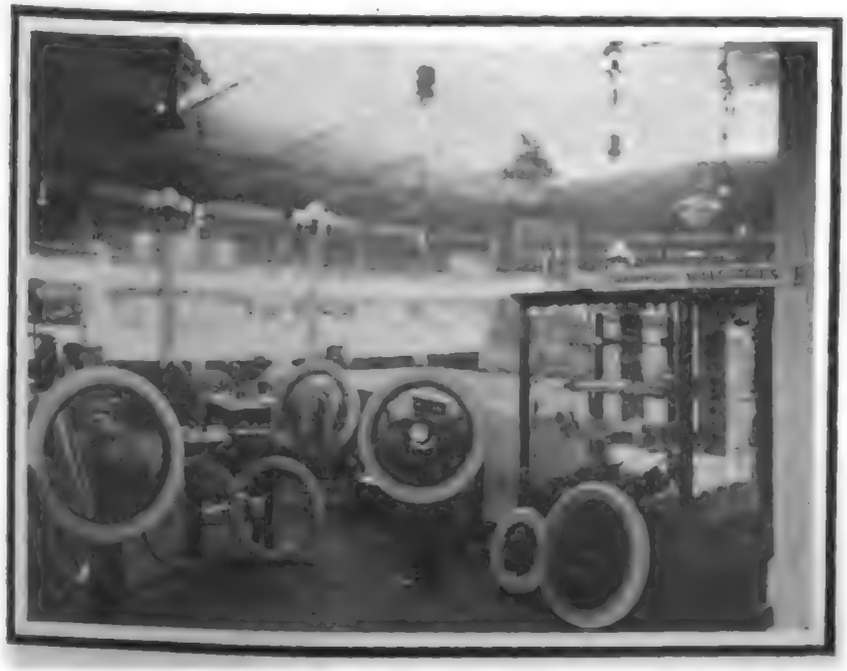
Electric Auto Lite Co., Toledo, Ohio—Auto Lite lighting and starting systems.

Elliot, H. A., Detroit, Mich.—Forged parts, Derihon and Bishoff steels.

Empire Tire Co., Trenton, N. J.—Empire tires.

Edmunds & Jones Mfg. Co., Detroit, Mich.—Lamps.†

Endurance Tire & Rubber Co., New York City—Endurance red inner tubes.



GOODYEAR EXHIBIT FEATURING WIRE WHEEL TIRES

English & Mersick Co., New Haven, Conn.—Metal trimmings.

Electric Storage Battery Co., Philadelphia, Pa.—Exide storage batteries.†

Englebert Tire Co., New York City—Tires.†

Essex Rubber Co., Trenton, N. J.—Rubber sundries.

Esterline Co., Lafayette, Ind.—Berdon electric lighting and starting system.*

Favary Tire & Cushion Co., New York City—Favary cushion tires.†

Faw, F. W., New York City—Gaskets, blowout patches, reliners and sundries.

Federal Rubber Mfg. Co., Milwaukee, Wis.—Federal tires.

Findeisen & Kropf Mfg. Co., Chicago, Ill.—Rayfield carburetters.†

Fischer Steel & Iron Works Co., Switzerland—Steels.†

Firestone Tire & Rubber Co., Akron, Ohio—Firestone tires.†

Fisk Rubber Co., Chicopee Falls, Mass.—Fisk tires.†

Flentje, Ernest, Cambridge, Mass.—Flentje recoil checks.*

Flechter & Co., L. V., New York City—American Locomotive carburetters.†

Flex-O-Fill Core Co., New York City—Tire fillers.

Four Wheel Auto Jack Co., Reading, Pa.—Four Wheel Jacks.

Franklin Mfg. Co., H. H., Syracuse, N. Y.—Die cast parts.

Frasse, Peter A., New York City—Fischer steel wheels and castings, Globe ball bearings.

Gabriel Horn Mfg. Co., Cleveland, Ohio—Gabriel horns and rebound snubbers.†

Garage Equipment Co., Milwaukee, Wis.—Universal bumpers, tire holders, windshields, vulcanizers, jacks and lamps.

Gasolene Filter Co., New York City—Perfect gasolene filters.†

Gemmer Mfg. Co., Detroit, Mich.—Gemmer steering gears.†

General Rim Co., New York City.—Rims.†

Gibney Rubber Co., J. L., Philadelphia, Pa.—Tires and vulcaniers.†

Gilmer, G. W., Jr., Philadelphia, Pa.—Gilmer tire repair patches and tools.

Globe Machine & Stamping Co., Cleveland, Ohio—Steel tool boxes, metal hampers, fenders and sheet metal parts.†

Golde Patent Mfg. Co., New York City—Golde tops.†

General Electric Co., Schenectady, N. Y.—Electric motors, rectifiers and apparatus and cloth pinions.*†

Goodrich Co., B. F., Akron, Ohio—Goodrich tires.†

Goodyear Tire & Rubber Co., Akron, Ohio—Goodyear tires.†

Gould Storage Battery Co., New York City—Gould batteries and Duplex lighting and ignition systems.*†

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Grant-Lees Mch. Co., Cleveland, Ohio—Gearsets.

Gray & Davis, Amesbury, Mass.—Lamps and electric starting and lighting systems.**†

Gray Specialty Co., Newark, N. J.—Sundries.*

Grossman Co., Emil, New York City—Redhead spark plugs, E-G bumpers and sundries.

Haedge & Richter, Hanover, Germany—Rivets and riveting machines.

Hagerstown Legging Co., Hagerstown, Pa.—Apparel.*

Harris Oil Co., A. W., Providence, R. I.—Lubricants.†

Hartford Machine Screw Co., Hartford, Conn.—Screw machine parts, spark plugs and tire pumps.

Hartford Suspension Co., Jersey City, N. J.—Truffault-Hartford shock absorbers, Hartford electric starting and lighting systems and jacks and bumpers.**†

Haws, George A., New York City—Panhard lubricants.

Hawthorne Mfg. Co., Bridgeport, Conn.—Old Sol lamps.*

Havoline Oil Co., New York City—Havoline lubricants.†

Hayes Mfg. Co., Detroit, Mich.—Metal bodies, tool boxes, running boards and sheet metal parts.

Herz & Co., New York City—Herz Magnetos, timers, spark plugs and ignition supplies.*

Hess Spring & Axle Co., Carthage, Ohio—Springs and axles.

Hess Steel Castings Co., Bridgeton, N. J.—Steel castings.†

Hess-Bright Mfg. Co., Philadelphia, Pa.—Hess-Bright ball bearings.†

Heinze Electric Co., Lowell, Mass.—Magnetos and coils.†

Hoffecker Co., Boston, Mass.—Hoffecker Steady Hand speedometers.

International Accessories Mfg. Co., New York City—A. B. C. carburetters.†

International Acheson Graphite Co., Niagara Falls, N. Y.—Oildag and Gredag lubricants.

International Metal Polish Co., New York City—Blue Ribbon polishes.

Janney-Steinmetz & Co., Philadelphia, Pa.—Cold drawn, seamless steel tanks.†

Jeffery-Dewitt Co., Detroit, Mich.—Reliance and J-D Visible spark plugs.*

J-M Shock Absorber Co., Philadelphia, Pa.—J-M shock absorbers.

Jones & Co., Phineas, Newark, N. J.—Wood wheels.†

Justice Co., A. R., Philadelphia, Pa.—U-Kan plating polish.

Kahnweiler Sons, David, New York City—Simplex fire extinguishers.†

Kent Mfg. Works, Atwater, Philadelphia, Pa.—Unisparker ignition systems and Monoplex horns.†

Kellogg Mfg. Co., Rochester, N. Y.—Hand and power pumps and air engine starters.

Kells Mfg. Co., W. J., New York City—Radiators.†

Kelly-Springfield Tire Co., New York City—Kelly-Springfield tires.†

Kokomo Electric Co., Kokomo, Ind.—Kingston magnetos, coils and timers.

K-W Ignition Co., Cleveland, Ohio—K-W magnetos and coils.†

Laidlaw, Jr., Wm. B., New York City—Top and cover fabrics.

Lavigne Gear Co., Corliss, Wis.—Steering gears.

Leather Tire Goods Co., Niagara Falls, N. Y.—Woodworth tire treads, Kant Skid tire bands, repair boots, etc.

Leeds & Northrup Co., Philadelphia, Pa.—Pyrometers and steel testing instruments.†

Lee Tire & Rubber Co., Conshohocken, Pa.—Lee and Leeland tires and Wayinaker

McCord Mfg. Co., Detroit, Mich.—Radiators, lubricants, fans and McKim gaskets.†

McCue Co., Buffalo, N. Y.—McCue axles and wire wheels.**

Merchant & Evans Co., Philadelphia, Pa.—Hele Shaw clutches, gearsets, Star tire cases.†

Metal Shelter Co., St. Paul, Minn.—Portable garages.

Metal Stamping Co., Long Island City, N. Y.—Stampings.

Mezger, C. A., New York City—Sootproof spark plugs.

Michaud, J. O., Fort Kent, Me.—Gearsets.*

Miller, Charles E., New York City—Brampton chains, Miller spark plugs and spring lubricators, Pan-American lubricants and sundries.**

Miller Rubber Co., Buffalo, N. Y.—Miller tires.

Model Gas Engine Works, Peru, Ind.—Model motors.†

Mosler & Co., A. R., Mount Vernon, N. Y.—Spitfire spark plugs and Umph timers.†

Mossberg, Frank, Attleboro, Mass.—Wrenches.

Motor Car Equipment Co., Akron, Ohio—Supplies.

Motsinger Devices Mfg. Co., Pendleton, Ind.—Motsinger autosparkers and carburetters.†

Motometer Co., New York City—Motometer temperature indicator.†

Motz Tire & Rubber Co., Akron, Ohio—Motz cushion tires.†

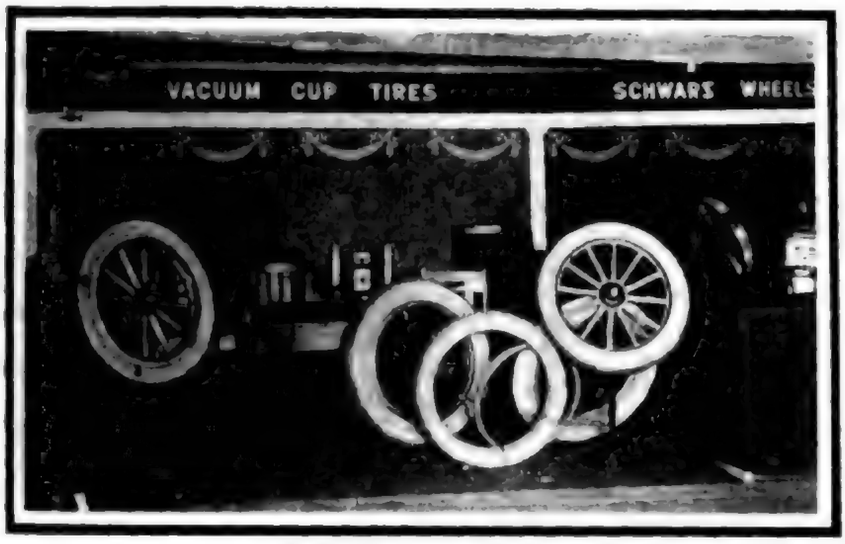
Muncie Gear Works, Muncie, Ind.—Gears, wheels and gearsets.†

Mutty Co., L. J., Boston, Mass.—Upholstery materials.

Nathan Novelty Mfg. Co., New York City—Leather sundries.

National Coil Co., Lansing, Mich.—Spark

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GARDEN EXHIBIT OF PENNSYLVANIA VACUUM CUP TIRES

Noera Mfg. Co., Waterbury, Conn.—Pumps and oil cans.

Nonpareil Horn Mfg. Co., New York City—Nonpareil bulb horns.

Norma Co. of America, New York City—systems.

North East Electric Co., Rochester, N. Y.—North East electric lighting and starting Norma ball bearings.*†

Northway Motor & Mfg. Co., Detroit, Mich.—Northway motors.

O. A. R. Motor Co., Plainfield, N. J.—O. A. R. motors.

Overman Tire Co., New York City—Overman tires.†

Pantasote Co., New York City—Pantasote top and seat coverings.†

Peacock Co., Clarence H., New York City—Ames shock absorbers.†

Pennsylvania Rubber Co., Jeannette, Pa.—Pennsylvania tires.†

Perfection Spring Co., Cleveland, Ohio—Krupp steel springs.†

Perfect Tire Sales Co., Philadelphia, Pa.—Tires.

Perfecto Wind Deflector Co.—Boston, Mass.—Windshields.

Philadelphia Storage Battery Co., Philadelphia, Pa.—Philadelphia batteries.*†

Piel Co., G., Long Island City, N. Y.—Long horns and G-P muffler cut-outs.

Polson Mfg. Co., Buffalo, N. Y.—Polson windshields.

Portage Rubber Co., Barberton, Ohio—Portage tires.

Presto Inter Rim Co., Boston, Mass.—Presto Q. D. rims.

Prosser & Son, Thos., New York City—Krupp steels.†

Pyrene Mfg. Co., New York City—Pyrene fire extinguishers.

Randall-Faichney Co., Boston, Mass.—Jericho and Jubilee exhaust horns, muffler cut-outs, B'Line grease guns, Jericho gas regulators, Webster tank gauges and other sundries.†

Remy Electric Co., Anderson, Ind.—Remy magnetos and lighting systems.†

Republic Rubber Co., Youngstown, Ohio—Republic tires.†

Reilly & Son, Newark, N. J.—Trimming leathers.

Rhineland Machine Works Co., New York City—Rhineland bearings.†

R. I. V. Co., New York City—R. I. V. ball bearings.**

Rich Tool Co., Chicago, Ill.—Tools and Tungsten valves.*†

Riley-Klotz Mfg. Co., Newark, N. J.—Bulb horns.

Rose Mfg. Co., Philadelphia, Pa.—Neverout lamps, license brackets, and heaters.†

Ross Gear & Tool Co., Lafayette, Ind.—Tools.**†

Royal Equipment Co., Bridgeport, Conn.—Duplex and Raymond brakes, Raybestos brake linings, Gyrex mixers.†

Roberts, H. T., Chicago, Ill.—Heitiger carburetters, Eclipse motorcycle fittings.

Rushmore Dynamo Works, Plainfield, N. J.—Rushmore electric lighting and starting systems.

Russian Tire Sales Co., New York City—Prowodnik tires.

Sager Co., J. H., Rochester, N. Y.—Sager bumpers and supplementary springs.

S. B. R. Specialty Co., East Orange, N. J.—Sundries.

Sarco Engineering Co., New York City—Coventry chains.†

Schendler, Charles A., Hoboken, N. J.—Signal gloves.

Schoen-Jackson Co., Media, Pa.—Feps carburetters and flexible metal hose.**

Schrader's Sons, Inc., A., New York City—Universal tire valves and pressure gauges.†

Schwartz Wheel Co., Philadelphia, Pa.—Wood wheels.†

Service Recorder Co., Chicago, Ill.—Truck recorders and hub odometers.†

Seamless Rubber Co., New Haven, Conn.—Seamless tires and inner tubes.†

Sewell Cushion Wheel Co., Detroit, Mich.—Cushion wheels.†

Shaler Co., C. A., Waupun, Wis.—Shaler vulcanizers.

Sheldon Axle Co., Wilkesbarre, Pa.—Axles and springs.†

Silvex Co., New York City—Polishes.

Simms Magneto Co., New York City—Simms magnetos.**†

S. K. F. Ball Bearing Co., New York City—S. K. F. ball bearings.

Smith Co., A. O., Milwaukee, Wis.—Parts.†

Sonneborn Sons, Inc., L., New York City—Lubricants.

Soss Mfg. Co., Brooklyn, N. Y.—Soss invisible hinges.*



EXHIBIT OF NEW DEPARTURE BEARINGS IN MADISON SQUARE GARDEN

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Spacke Machine Co., F. W., Indianapolis, Ind.—De Luxe motorcycle motors and parts.

Sparks-Withington Co., Jackson, Mich.—Fans and Sparton horns.

Spicer Mfg. Co., Plainfield, N. J.—Spicer universal joints.†

Splitdorf Electrical Co., Newark, N. J.—Splitdorf magnetos, coils, plugs and other ignition devices, also electric lighting system.*†

Standard Roller Bearing Co., Philadelphia, Pa.—Standard ball and roller bearings.†

Standard Welding Co., Cleveland, Ohio—Stanweld rims, electrically welded tubing and parts.**

Standard Woven Fabric Co., Worcester, Mass.—Brake linings.

Standard Thermometer Co., Boston, Mass.—Standard speedometers and Abell tire pumps.**

Stanley, J. T., New York City—Soaps and polishes.

Stewart & Clark Mfg. Co., Chicago, Ill.—Stewart speedometers.†

Stevens & Co., New York City—Sundries.

Stromberg Motor Devices Co., Chicago, Ill.—Stromberg carburetters.†

Sunderman Safety Carburetter Co.—Sunderman carburetters.

Suspension Roller Bearing Co., Sandusky, Ohio—Boyer suspension bearings.

Swinehart Tire & Rubber Co., Akron, Ohio—Swinehart tires.†

Taylor Co., H. D., Buffalo, N. Y.—Upholstery materials.*

Texas Co., New York City—Lubricants.*†

Thermoid Rubber Co., Trenton, N. J.—Thermoid tires.*

Timken-Detroit Axle Co., Detroit, Mich.—Timken hollow cast steel wheels and bevel and worm axles.*†

Timken Roller Bearing Co., Canton, Ohio—Timken taper roller bearings.*†

Tingley & Co., C. O., Rahway, N. J.—Vulcanizing outfits.

Tobey, Wm. L., Boston, Mass.—Q. D. rim removers and glare removers.

Tochenson Gear & Axle Co., Newark, N. J.

United States Gauge Co., New York City—Pressure gauges.

United States Light & Heating Co., New York City—U. S. L. starting and lighting systems and storage batteries.*†

U. S. Tire Co., New York City—United States tires.†

Vacuum Oil Co., New York City—Mobil oils and greases.†

Valentine & Co., New York City—Varnishes.†

Veeder Mfg. Co., Hartford, Conn.—Veeder tachometers, odometers and die cast parts.†

Vesta Accumulator Co., Chicago, Ill.—Vesta storage batteries and lighting systems.*†

Voorhees Rubber Mfg. Co., Jersey City, N. J.—Brown Scientific inner tubes.

V-Ray Co., Chicago, Ill.—V-Ray plugs.

Walpole Rubber Co., Boston, Mass.—Walpole tires.

Ward Leonard Electric Co., Bronxville, N. Y.—Ward Leonard electric lighting and starting systems.

Warner Gear Co., Muncie, Ind.—Gears and parts and Gardner engine starters.*†

Warner Mfg. Co., Toledo, Ohio.—Gearsets.*†

Warner Instrument Co., Beloit, Wis.—Warner autometers.*†

Wasson Piston Ring Co., Hoboken, N. J.—Wasson piston rings.

Wayne Oil Tank & Pump Co., Ft. Wayne, Ind.—Wayne tanks and storage systems.

Webster MacDonell Co., Haverhill, Mass.—Inner tubes.

Weed Chain Tire Grip Co., New York City—Weed chains.†

Wells Bros. Co., Greenfield, Mass.—Screw cutting tools.*†

Western Electric Pittsfield Co., Pittsfield, Mass.—Pittsfield magnetos, coils, etc.

Western Tool & Forge Co., Brackenridge, Pa.—Drop forgings.

West Side Y. M. C. A., New York City—Instruction.

Weston-Mott Co., Flint, Mich.—Axles and parts.†

Westinghouse Electric & Mfg. Co., Pitts-

Young, O. W., Newark, N. J.—Lubricants, tire repair outfits.†

Zip Co., Ltd., Toronto, Can.—Zip puncture sealer.

Summary of Motorcycles Displayed.

American Motor Co., Brockton, Mass.—Eagle, single, and M-M, twin, $235 to $275.

Aurora Automatic Machinery Co., Chicago, Ill.—Thor, single and twin, $200 to $240.

Baxter Side Car Co., Cambridge, Mass.—Baxter side cars, $60 to $80.

Consolidated Mfg. Co., Toledo, O.—Yale, single and twin, $225 to $275.

Davis Sewing Machine Co., Dayton, O.—Dayton, twin, $265 to $275.

Excelsior Motor Mfg. & Supply Co., Chicago, Ill.—Excelsior, single and twin, $200 to $250.

Emblem Mfg. Co., Angola, N. Y.—Emblem, single and twin, $175 to $300.

Greyhound Motor Co., Buffalo, N. Y.—Greyhound side cars.

Harley-Davidson Motor Co., Milwaukee, Wis.—Harley-Davidson, single and twin, $235 to $285.

Hendee Mfg. Co., Springfield, Mass.—Indian, single and twin, $200 to $325.

Henderson Motorcycle Co., Detroit, Mich.—Henderson, four, $325.

Ives Motorcycle Corp., Owego, N. Y.—Monarch, single and twin, $225 to $275.

Majestic Mfg. Co., Worcester, Mass.—Majestic side cars, $65 to $90.

Miami Cycle & Mfg. Co., Middletown, O.—Merkel, single and twin, $210 to $335.

Minneapolis Motor Co., Minneapolis, Minn.—Minneapolis, single and twin, $225 to $375.

Pierce Cycle Co., Buffalo, N. Y.—Pierce, single and four, $225 to $400.

Pope Mfg. Co., Hartford, Conn.—Pope, single and twin, $165 to $250.

Reading Standard Co., Reading, Pa.—R-S, single and twin, $200 to $275.

Schickel Motor Co., Stamford, Conn.—Schickel, single, $225 to $240.

Triumph Mfg. Co., Detroit, Mich.—Triumph, single and twin, $225 to $250.

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WELCOME THE TRUCK; SPEED THE PLEASURE CAR

Trucks Will Be Less Spectacular, but Will Not Lack Interest Because of the Fact—Comparisons, Which Are Not Odious, Show Strong Tendency Toward Standardization—Improvements That Will Be Disclosed.

It is possible—it is, in fact, extremely probable—that the crowds that will invade Madison Square Garden and Grand Central Palace next week will not be so large as those which have pressed the salesmen against their cars during the present week, and that there will be a smaller proportion of wearers of fashionable apparel—especially of the feminine variety. But—and it is a "but" of extremely large dimensions—it is likely to be the kind of a crowd the dealers like—an interested crowd—a "buying" crowd. For when Part I—pleasure cars—moves out on Saturday night, its place will be taken by Part II, which denomination covers the grimmer instruments of commerce that go under the general designation of commercial motor vehicles—delivery wagons (light and heavy), motor wagons, trucks, tractors, and all the various and multifarious members of the big family, and there are not many who go to see them as a mere spectacle. They are far less decorative than pleasure cars, and there is a total lack of the glamor that adds to the magnetism of the lighter, swifter and more ornate cars, and those who go to the truck show usually have some good reason for doing so—and the reasons usually can be traced to a financial root

And while the dealers are only too delighted to welcome those who are possible future purchasers—to say nothing of those who are merely interested—it may be said with entire sincerity that the dealers are prepared to treat purchasers better than at any previous shows. There has been little or no tendency during the past year to go shooting off at a tangent with fantastic designs; rather, the more conservative and familiar things have been adhered to and improved, and at the same time manufacturing methods have been refined and made less expensive, so that in many cases—in fact, in most cases—the buyers of trucks get more actual value for their money than has been possible heretofore.

For those who are genuinely interested, either as users or from a mechanical point of view only, there will be a good deal that will be well worth inspecting, notwithstanding the fact that commercial vehicles are gradually approaching a more or less uniform set of types, so to speak, and exhibit fewer radical differences than in the past. For instance, there will be several worm-driven machines covering a wide range of capacities, from the Smith-Milwaukee six-tonner and the Pierce-Arrow five-tonner down to the light types, which will include a brand new, popularly priced Gramm. Rowe, Universal, Blair and Schacht will show worm driving systems worked out for commercial service. The La France, with the Manly hydraulic drive, will be a center of interest, even though it is not exactly brand new.

The number of trucks that have settled down to a standard of construction and do not vary it appreciably is distinctly on the increase. White, Alco, Garford, Peerless, Packard, Pierce, Reo, Buick, Velie, Mack, Saurer, Hewitt, Knox and all the noble army of electrics are in the forms in which they have already been made familiar, though it goes without saying that there are numerous changes and improvements that experience has suggested. Even new machines, appearing for the first time, step at once into some one of the standard classes, for the time has passed when every man dreamed himself a fearful and wonderful machine, built it—and then started on the thorny—under the circumstances—path to the knowledge of how a truck ought to be constructed.

It goes without saying that there will be a few unexpected things brought out at the double show; there never was a show that did not develop something of the kind, whether good, bad or indifferent. But it is pretty safe to venture the guess that they will be practicalities and not of "the stuff that dreams are made on." It is just possible that there may be a few surprises in the way of motor starters; there seems no good reason why commercial vehicles should not be equipped with these conveniences, and the mere fact that manufacturers have been rather reticent on the subject may presage the appearance of a few at the show. It is a certainty, however, that there will be a great many left-steered machines with center control or without, and also that the good work that already has been done by governors will be reflected in the fitting of these money-savers to a large proportion of the cars exhibited.

Of the electric squad, it may be said that they long ago ceased to make changes in anything except details. All are of standardized designs and the principles involved have been tried out and tested in every possible way—and this applies as well to the old timers and to the new comer, the Atlantic. Better motors, better batteries and better bearings and moving parts generally have brought about better service in every way. The reliability of the electric is one of its strongest points.

A truck that is so young that it really has not been born to commercial existence is the Croce, for the manufacture of which a factory is in process of construction at Asbury Park, N. Y. The first machine was built in a machine shop and was the seed from which first a company and then a factory grew. The car is expected to show some feature of more than usual interest.

In the heavy truck field the possibilities that lie in the tractor principle have been given no little consideration, and there will be special machines designed as tractors or semi-tractors, in which class the new Baker

IN MADISON SQUARE GARDEN

Alco	Mack
Autocar	Packard
Buick	Peerless
Federal	Pierce-Arrow
Garford	Pope
G M C	Reo
Gramm	Saurer
Hewitt	Selden
Hupp	Speedwell
Kelly-Springfield	Velie
Kissel	Walter
Knox	White

Locomobile

IN GRAND CENTRAL PALACE

Atlantic	Lansden
Atterbury	Maccarr
Baker	Mais
Bessemer	Modern
Blair	Randolph
Brown	Rowe
Chase	Sanford
Croce	Schacht
Dart	Service
Driggs-Seabury	Smith-Milwaukee
Flint	Standard
General Vehicle	Sternberg
B. A. Gramm	Stewart
Decatur	Studebaker
I H C	Sullivan
Koehler	Universal
Krebs	Ward
LaFrance	Waverley
Lauth-Juergens	Webb

Lippard-Stewart

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electric is prominent—a short, stocky, powerful machine intended for hauling.

There will be several exhibitors in the accessories class who were not in evidence at the pleasure car shows. These are as follows: American Kushion Kore Tire Co., New York City, tire filler; Wm. H. Brown, Cleveland, Ohio; Eureka Non-Skid Mfg. Co., Brooklyn, N. Y., anti-skidding devices; Federal Chain & Mfg. Co., Springfield, Mass., Federal and Gaylor non-skidding devices; Never Skid Mfg. Co., New York City, anti-skidding devices; Pioneer Steel & Block Tire Co., St. Louis, Mo., Pioneer tires; Polack Tire Co., New York City, Polack tires.

Summary of Trucks To Be Displayed.

* Denotes Exhibit in Grand Central Palace; Without Such Notation in Madison Square Garden.

Atlantic Vehicle Co., New York. Atlantic. Electrics, 1 to 5 tons; prices $2,000 to $4,000.*

Atterbury Motor Car Co., Buffalo, N. Y. Atterbury. Gasolene, 1,500 pounds to 3 tons; prices $1,250 to $3,600.*

American Locomotive Co., New York. Alco. Gasolene, 2 to 6½ tons; prices, $2,950 to $5,200.

Autocar Co., Ardmore, Pa. Autocar. Gasolene, 3,000 pounds; price, $2,150.

Baker Motor Vehicle Co., Cleveland, O. Baker. Electric, 500 pounds to 4 tons; prices, $1,800 to $3,500.*

Bessemer Motor Truck Co., Grove City, Pa. Bessemer. Gasolene, 1,000 to 3,000 pounds; prices, $1,200 to $2,700.*

Blair Mfg. Co., Newark, N. J. Blair. Gasolene, 1½ to 3½ tons; prices, $3,000 to $3,750.*

Bowling Green Motor Car Co., Bowling Garford Co., Elyria, O. Garford. Gasolene, 1½ to 5 tons.

General Motors Truck Co., Pontiac, Mich. G M C. Electric and gasolene, electric 1,000 pounds to 6 tons and gasolene 1¼ to 5 tons.

General Vehicle Co., Long Island City, N. Y. General Vehicle. Electric, 750 pounds to 5 tons.*

Gramm Motor Truck Co., Lima, O. Gramm. Gasolene.

Gramm-Bernstein Co., Lima, O. B. A. Gramm. Gasolene. 2 to 3½ tons; prices, $2,750 to $3,600.*

Grand Rapids Motor Truck Co., Grand Rapids, Mich. Decatur. Gasolene, 1½ tons.*

Hydraulic Truck Sales Co., New York. La France. Gasolene, 3 tons.*

Hewitt Motor Co., New York. Hewitt. Gasolene, 1 to 10 tons, prices $1,800 to $5,500.

Hupp Motor Car Co., Detroit, Mich. Hupmobile. Gasolene, 800 pounds; price $950.

International Harvester Co., Chicago. I. H. C. Gasolene, 1,000 pounds.*

Kelly Motor Truck Co., Springfield, O. Kelly. Gasolene, 1 to 3 tons; prices $2,000 and up.

Kissel Motor Car Co., Hartford, Wis. Kissel. Gasolene, 1,500 pounds to 5 tons; prices $1,500 to $4,350.

Knox Automobile Co., Springfield, Mass. Knox. Gasolene, 2 to 6 tons; prices $2,750 to $5,000.

Koehler S. G. Co., H. J., New York. Koehler. Gasolene, 1,600 pounds; price $750.*

Krebs Commercial Car Co., Clyde, O. Krebs. Gasolene, 1,500 pounds; price $1,375.*

Lauth-Juergens Motor Car Co., Fremont, Pierce-Arrow Motor Car Co., Buffalo, N. Y. Pierce-Arrow. Gasolene, 5 tons; price $4,500.

Pope Mfg. Co., Hartford, Conn. Pope-Hartford. Gasolene, 3 to 5 tons; prices $3,350 to $4,475.

Randolph Motor Truck Co., Chicago, Ill. Randolph. Gasolene.*

Reo Motor Car Co., Lansing, Mich. Reo. Gasolene, 1,500 pounds to 2 tons; prices $760 to $1,800.

Rowe Motor Mfg. Co., Coatesville, Pa. Rowe. Gasolene.*

Sanford Motor Truck Co., Syracuse, N. Y. Sanford. Gasolene, 1 ton; price, $1,600.*

Saurer Motor Co., New York. Saurer. Gasolene, 4½ to 6 tons.

Schacht Motor Car Co., Cincinnati, O. Schacht. Gasolene, 1,500 pounds to 4 tons; prices $1,600 to $3,300.*

Selden Motor Vehicle Co., Rochester, N. Y. Selden. Gasolene, 1 ton; price $2,000.

Service Motor Car Co., Wabash, Ind. Service. Gasolene, 1,500 pounds to 1½ tons; prices $1,350 to $1,675.*

Smith Co., A. O., Milwaukee, Wis. Smith-Milwaukee. Gasolene, 3½ to 6 tons.*

Speedwell Motor Car Co., Dayton, O. Speedwell. Gasolene, 2 to 6 tons; prices $3,750 to $4,400.

Standard Motor Truck Co., Detroit, Mich. Standard. Gasolene, 3 tons; price $2,750.*

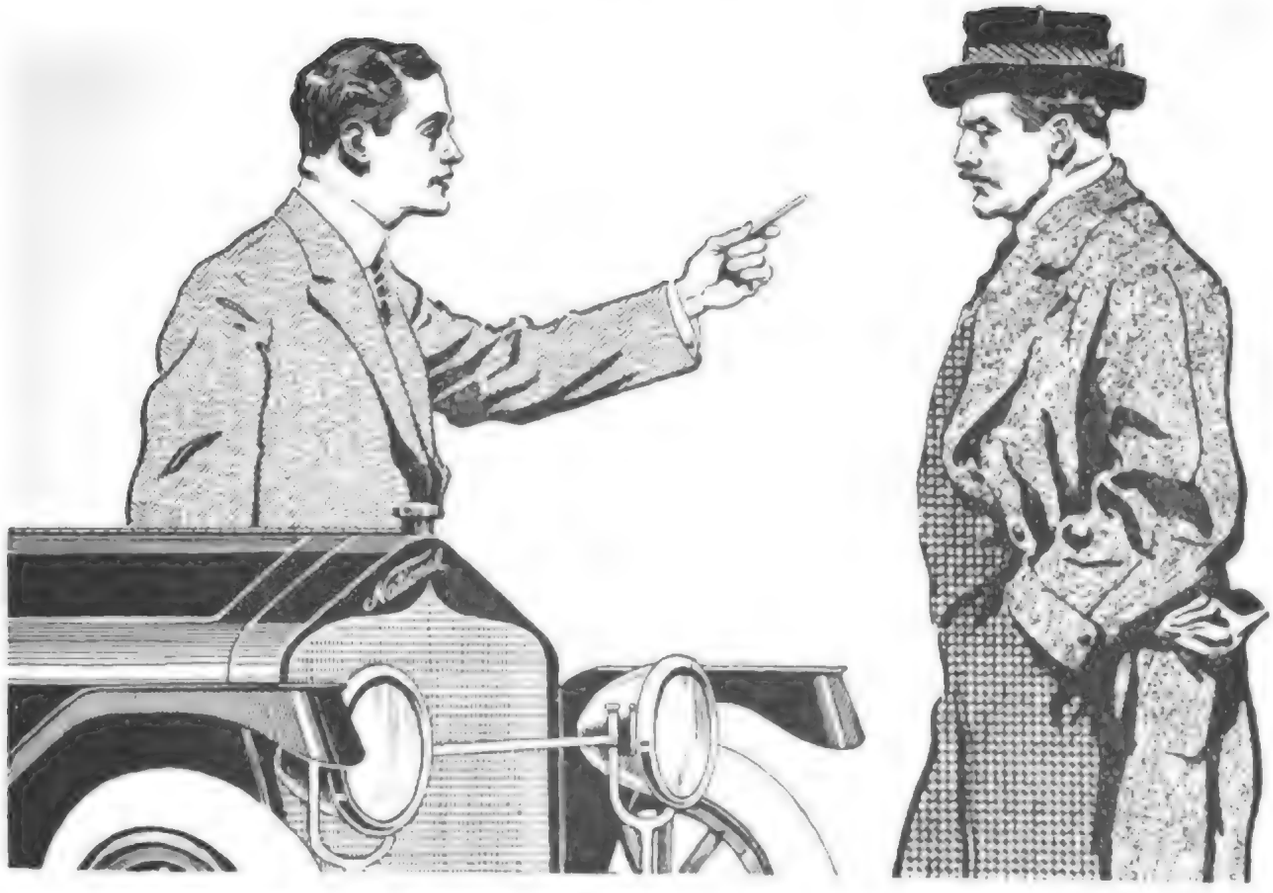
Stegeman Motor Car Co., Milwaukee, Wis. Stegeman. Gasolene.

Sternberg Mfg. Co., Milwaukee, Wis. Sternberg. Gasolene, 2 to 5 tons; prices $2,800 to $4,500.*

Stewart Motor Corp., Buffalo, N. Y. Stewart. Gasolene, 1,500 pounds; price $1,650.*

Studebaker Corp., Detroit, Mich. Studebaker. Electric and gasolene, electric 500 pounds to 5 tons; gasolene, light deliv-

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You Can Look a Man in the Eye When You Sell the National

You don't have to exaggerate

It is the path of least resistance to sell National cars because of their apparent and demonstrated qualities. Glance at these few features—can you beat them on any other cars, for the price?

Long stroke (4⅛ x 6) flexible and noiseless Motor with enclosed valves.
Left side drive.
Center control.
Gray & Davis Electric Starter.
Gray & Davis Dynamo Electric Lighting System.
Bosch double dual Magneto.
12-inch Turkish Upholstery.
Full heavy nickel Trimmings.
Multiple jet Carburetor.
Electric Horn.
Adequate baggage carrying Compartment concealed in body but easily accessible.
Powerful and reliable Brakes.
Tire Pump, integral part of the motor.
128-inch wheel base.
Adjustable ventilating and rain vision Wind Shield.
Hoffecker Speedometer.
Tire Carrier in rear.
Silk Mohair Top, Cover and Curtains.
Full floating Rear Axle.
Resilient Springs, ¾ elliptic in rear.
Large gasoline pressure-feed Tank in rear with Gauge.
Plain, continuous, enclosed Metal Guards.
The only perfect Oiling System.
Truffault-Hartford Shock Absorbers on rear.
One extra Firestone demountable rim.

If We Can Prove This, Are You Interested?

We say that the National is superior to any other car in actual worth that sells for the same price—we go further and say that we give you as much service and quality as any $5000 car.

We say that money can not buy better materials than used in the National—that the National has the most flexible motor—the most perfect oiling system—the greatest degree of luxurious upholstery and comfort—and we say that the National is a money-making car for dealers because of its merits and reputation. Don't you think you should at least investigate our claims?

Improved Series V. Five Models
$2750 to $3400

National Motor Vehicle Co.
INDIANAPOLIS, IND.

Maker of
Stock Champion and International Champion

MAIL THIS COUPON TODAY

NATIONAL MOTOR VEHICLE CO., Indianapolis, Ind.
Please send at once complete information on Improved Series V National cars.

Name.....

Address.....

LEGISLATION PLANNED TO REDUCE DRIVING HAZARDS

Connecticut Association to Present Three Traffic Regulations to Legislature—Nearly All Old Officers Re-elected.

That the Connecticut Automobile Association is nothing if not alive to the interests of its members was evidenced at the last meeting of the Executive Board, which was held at the headquarters of the Hartford Automobile Club on Monday, when no less than three bills, calculated to reduce the hazard of driving, were drawn up for presentation in the General Assembly under the sponsorship of the association. At the same time, a vote was passed recommending that a single State tax be substituted for the triple taxation now imposed by the State, the county and the borough or city.

The first of the bills provides that all vehicles must carry lights; the second provides that the drivers of horse-drawn vehicles must not have their view to the back and the sides obstructed by their loads; and the third provides for the trimming of trees and shrubs at intersections of roads and at curves where thick foliage prevents a clear view of traffic.

At the election which preceded the transaction of business, the old board of officers was re-elected, with scarcely a change, the list being as follows: F. T. Staples (Bridgeport), president; John N. Brooks (Torrington), vice-president; C. N. Robinson (New Haven), secretary; Fred C. Howe (New Haven), treasurer. In the board of directors, R. P. Lewis takes the place of E. J. Daly in the Waterbury district; in the Hartford district, Arthur Fifoot and F. Spencer Goodwin were added, and in New Haven the new representation consists of Philip Bond, Adolph Mendall, Frank Mason and George Coan; the Danbury district this year is represented by E. N. Bailey and the New London district by R. H. Bonds, Jr.; Norwalk and Rockville are represented by Dr. D. W. McFarlane and W. H. Robinson, respectively.

More "Outrages" by Contest Board.

At its meeting in New York on Friday last, 10th inst., the A. A. A. contest board committed more of those "outrages" which caused 20-odd Los Angeles men to hurl defiance and constitute themselves the Western Automobile Association, which is to say that Teddy Tetzlaff, who participated in an unsanctioned racemeet held in San Fernando, Cal., on November 28th last, was given an opportunity to cool his heels until May 28th next. Tetzlaff's suspension was automatic, of course, but the A. A. A. action makes it cover a definite period. The ban has been made to cover E. E. Hewlett, whose Fiat car Tetzlaff drove; Hewlett's suspension is for a similar period. Ralph C. Hamlin, who drove the winning Franklin in the 1912 Los Angeles-Phoenix desert race, was disqualified and suspended until April 1st for advertising the car as a "regular stock car," despite the fact that the race was run as a non-stock free-for-all event.

Roman Wins $100 for Anti-Bulb Letter.

The first prize of $100, which was offered by the Lovell-McConnell Mfg. Co., of Newark, N. J., for the best letter telling why the bulb horn should be discontinued as the "customary" signal in the equipment of the modern automobile, has been awarded to F. A. Sears of Rome, N. Y., whose letter, in the opinion of the board of judges, was the best of the 700 received and considered. The second prize of $50 was awarded to Dr. A. C. Smith of Elberton, Ga., and the 10 prizes of $10 each for the 10 next best letters have been sent to Wm. E. Joyce, of Detroit, Mich.; James A. Burke, of Bridgeport, Conn.; C. M. Siever, of Holton, Kan.; Elmer Eby, of Lititz, Pa.; D. D. Truesdale, of Bunker Hill, Ill.; A. Reis Meyer, of Cincinnati, O.; G. W. Putnam, of Yorkeville, Ill.; Connover & Robinson, of New York City; Harold A. Barber, of Detroit, Mich.; and Herbert V. Burland, of New York City. Not all of the letters received for consideration were penned by motorists or those connected with the trade, and as a result the reasons given why the bulb horn should be retired in favor of a more adequate signal were many and varied.

A. A. A. Denies Reinstatement of Staver.

Although it was hoped that the suspension of the Staver Carriage Co., of Chicago, Ill., would be lifted at the last meeting of the Contest Board of the American Automobile Association, the hope came to naught, for the company's application was considered and denied. The Staver company was disqualified and suspended until June 1st, 1913, on October 21st last, for advertising the Staver-Chicago car driven in the "Around Lake Michigan" tour as a stock car in violation of Rule 75 of the A. A. A.; the tour was a Grade III non-stock run.

At the annual election of the Yonkers (N. Y.) Automobile Club, John J. Walsh was elected president, William A. Allen vice-president, Ernest N. Cokefair secretary, Charles F. May treasurer. The board of governers comprises the officers and Dr. G. Byron Brown, William E. Miller, Dr. A. Newell Benedict, William E. Yerkes.

UNSANCTIONED MEET MAKES OLDFIELD AN OUTLAW AGAIN

Forgets Promise to "Be Good" and Competes at "Local Interpreters'" First Meet—Teddy Tetzlaff Also Goes Over.

Despite his promise to "be good" when reinstated last year by the contest board of the A. A. A. on May 1st last, Barney Oldfield is again in the "outlaw" class, having participated in a two-day race meet—unsanctioned by the A. A. A. but run under auspices of the "outlaw" Western Automobile Association—which was run on the Los Angeles Motordrome track Saturday and Sunday last, January 11th and 12th. Tetzlaff, who was already under the ban of the A. A. A. for participating in an unsanctioned meet, also participated, as did George Hill, who won the recent San Diego road race and who, with Kincaid and Du Casse and several lesser lights, share the fate of Oldfield. To the latter, however, who has recently entered the liquor business in Los Angeles and announced his intention to withdraw from the ranks of the profession racing drivers, the suspension is a matter of slight import.

Saturday's program comprised the first heat of a three-heat match race between Oldfield (Christie) and Tetzlaff (Fiat), which went for a single mile and was won by the former in 36⅕ seconds; a five-mile match race between George Joermann (Maxwell) and Kincaide (Studebaker), which was won by Joermann; a five-mile free-for-all, which went to Magaun (Fiat), and a five-mile free-for-all handicap, won by George Hill (Fiat). On the second day Tetzlaff reciprocated and took the final two heats from Oldfield. The remainder of the program comprised a five-mile race for light cars, won by F. Goode (Studebaker), a five-mile contest for heavy cars, won by Magaun (Fiat), and a five-mile free-for-all, which went to Joermann (Maxwell).

Savannah Sets Dates for "Classics."

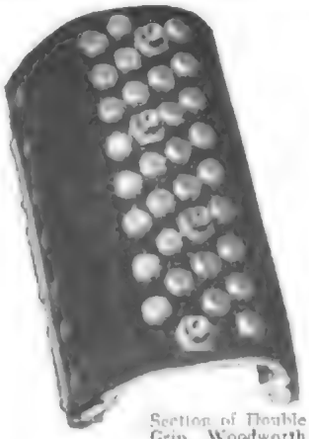
If things go according to the program as laid out by the Savannah Automobile Club but two days will intervene between the running of the Vanderbilt and the Grand Prize road races, November 25th and 27th having been chosen as tentative dates. The Grand Prize race will be run first, carrying out the idea of making it a curtain raiser for the Vanderbilt contest, as was to have been done at Milwaukee last year, had not bad weather and a worse course caused a reversal in the order of things. Naturally the carrying out of the schedule depends upon the action of the two contest boards

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DON'T DO IT



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Section of Double Grip Woodworth Treads, showing hardened high rivets.

Don't Throw Away This Added Business!

Do you realize that tire troubles are keeping many of your possible customers from buying cars? That many present customers—doctors, business men, and women drivers—are using their cars less than they would if it were not for the puncture bugbear?

Punctures—blowouts due to fabric rotting and the tedious fussing to keep tubes and casings in repair—these things are spoiling good business for you every day in the year. Eliminate them, and you will not only make a profit on the immediate sales, but will secure a large increase in general business as well.

Woodworth Treads

absolutely prevent punctures an droad damage to tires. They are a perfect non-skid in mud, snow, or ice. They save the time spent in patching cuts and blisters. They are readily applied or removed, yet **they cannot loosen or chafe the tires.**

Woodworth Treads Are Different

from other tire coverings. They are held tight by stiff patented-coil springs running around each side. They are thin, light and flexible—like a glove—because it is not necessary to make them excessively thick to resist stretching, as with rim-fastened coverings. Any stretch is taken up by the springs. The Tread hugs the tire like an elastic band, and simply stays on the job till it wears out.

We Guarantee Woodworth Treads

in the broadest manner as to service and freedom from damage to tires, and we will make good liberally on any failure in either respect. We support dealers in selling on 30-day trial, and we allow full credit on goods ordered but not sold.

To prove our statement, we will send any rated dealer a pair of Treads for his emergency or rental car on 30-day trial. Send no money! If on thorough trial you do not like the Treads well enough to use them for their time-saving value to you, return them and we will cancel the bill.

We have a bunch of dealer helps, too:—a full-sized lithographed metal reproduction of the Tread, sample sections showing the construction, and all needed literature. But a trial is the best proof! Write today: send your rear tire sizes and say "Show me!"

Leather Tire Goods Company

Niagara Falls, N. Y.

New York Store, 1608 Broadway



"Double Grip" Woodworth Tread, for use on snow and ice. The high rivets are cupped and hardened, and can be renewed.

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Eliminate the
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Tread for no
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e renewed.

Elyria-Dean



Elyria-Dean Magneto--A Better Kind Than You Have Known

The new Elyria-Dean ignition system gives a kind of service to the car owner unknown with any other system. The Elyria-Dean magneto employs high frequency, high tension, electrical discharges, instead of the ordinary high tension discharges used in other ignition systems.

This high frequency spark gives a new life and energy to the ignition, a feature much sought after by the intelligent car purchaser or owner.

It ignites the gas instantly, even with poor mixtures and gives complete and rapid combustion of large volumes. This means more power from your motor; it means quicker and more reliable power and a satisfaction that comes only with the best kind of ignition.

With the Elyria-Dean ignition system, wider spark plug gaps are permissible than with other systems and the disruptive action of the spark prevents fouling of the plugs. Ordinarily, plugs never have to be removed, except for mechanical breakage.

High cylinder pressures have less effect on this spark than on other ignition sparks.

"Self starters" are made successful on magneto ignition as effective sparks are obtained at very low speeds, below 50 R. P. M.

No missing of the motor with the Elyria-Dean, even at the lowest speeds. All wiring carries low voltage currents, as the little resonator coils at the plugs step-up the pressure just where it is used. This obviates leakages and the maintaining of high insulation in the magneto, switch and connecting wiring.

The exclusive manufacturing license has been granted us under the Seeley patents and pending applications, giving us the legal rights and only practical methods of applying high frequency currents to automobile ignition.

Manufactured only by

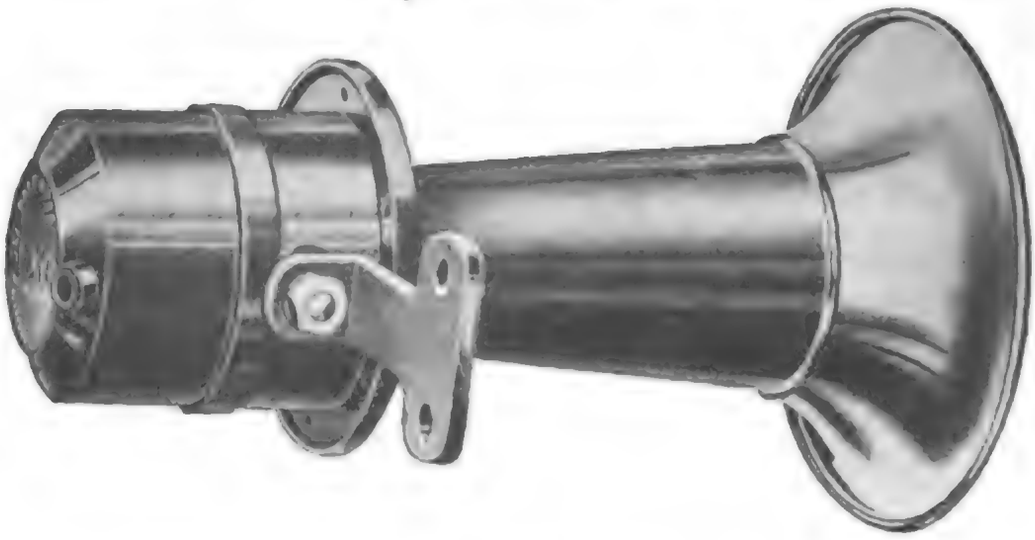
The Dean Electric Company

Electrical Apparatus

San Francisco — Elyria, Ohio, U. S. A. — Kansas City, Mo.

"Look for Elyria-Dean where quality's seen"

Elyria-Dean



REXO HORN
Electric Warning Signal

A "Standard Equipment Horn"

We have already sold over 65,000 Rexo Horns for 1913 cars. When you see a REXO on a car it means that the maker of that car is willing to hitch up his car's reputation with REXO reputation and take our word for it.

45,000 REXO Electric Horns of special design are specified by one car maker, the largest electric horn order ever placed.

The Electric Warning Signal will be standard equipment on practically every automobile marketed in 1913, and most of the earlier models will be brought up to date by the installation of an efficient electric horn by the car owners. We know this to be a fact for our mammoth sales of the Rexo, Tuto and Tuto-Ette Electric Horns to automobile manufacturers and jobbers is the most conclusive evidence.

Rexo Features

The sound of the REXO is loud, abrupt, clear and unlike the motor driven horn; it is instantly responsive.

The standard REXO horn is designed to operate from any 6-volt battery and the current required is never over 1.8 amperes. The REXO does not contain any moving parts which require tri-weekly lubrication, monthly overhauling, washing in gasoline, greasing, etc., nor is there any danger in clogging from dust or moisture. The operation is equally as positive in winter as in summer, as there is no oil or grease to congeal, etc.

The REXO requires no care or attention during the full season of running and only a very slight adjustment is necessary to overcome a full season's wear, and this can be done in a few minutes and with an ordinary screw driver, as there are no delicate parts which can be damaged.

Rexo Horn—complete with button and cord, $8.

At the New York Shows

REXO Horns and other Elyria-Dean products will be exhibited in space 305, Concert Hall, Madison Square Garden, and in Space 225, Balcony, Grand Central Palace.

Manufactured only by

The Dean Electric Company

Electrical Apparatus

San Francisco Elyria, Ohio, U. S.A. Kansas City, Mo.

"Look for Elyria-Dean where quality's seen"

Elyria-Dean



Elyria-Dean Speedometer

Simple and Always Accurate

The Elyria-Dean Speedometer has the most modern features of any speed measuring device on the market.

It has real speedometer value, easy reading, steady hand, permanent accuracy, lasting strength, neat design and handsome finish.

The dial is black with white markings; the case is beautifully finished in baked black enamel with nickel trimmings.

The hand is steady and shows the speed at a glance by its position. No need of laboriously deciphering the figures or markings as in other speedometers.

The cup is shaped so that a long scale of uniform division is obtained direct. No need to guess at the reading or doctor the scale.

The Odometer—Geneva type—is exceptionally reliable. Trip scale reset to the tenth mile, which facilitates following guide book markings.

It always adds mileage whether the car goes forward or backward, or whether shaft is driven from right or left hand wheel.

The Elyria-Dean Speedometer operates on the unvarying principle of direct centrifugal force. No compensating gears, springs or other parts to hamper or reduce accuracy.

The accuracy is unaffected by weather conditions. It registers the same in winter and in summer, in rain or in shine. No regulation or compensation required.

This elegant instrument is the proper equipment for the highest-priced and most luxurious motor cars. See it and other Elyria-Dean Products at the New York Shows.

Manufactured only by

The Dean Electric Company

Electrical Apparatus

San Francisco — Elyria, Ohio, U. S. A. — Kansas City, Mo.

"Look for Elyria-Dean where quality's seen"



The Driver's Hands Are Cosy — And the Other Fellow's Stiff

The Warm Hand Wheel is an appeal to reason, good judgment and common sense and every Dealer who reads this can realize its practical worth without extended argument.

The Warm Hand Wheel robs winter driving of half its unpleasantness by giving a rich, warm glow to hands that grow cold and numb even in heavy gloves. Think what this would mean to car owners in your territory if you would simply demonstrate it.

Now, don't get the idea that it is impractical or complicated. Quite the reverse. It is just as simple as the electric iron, cook stove or the hundreds of devices that are heated by the current.

The Warm Hand Wheel is an economical consumer of electricity. It operates equally well from lighting systems or storage batteries. Ford owners will get splendid results from the current from the "built in" fly wheel magneto. In brief, the Warm Hand Wheel is adapted to any modern car.

You, Mr. Dealer, can install it in a short time without interfering with any working parts of the car. Its installation is as simple as its function.

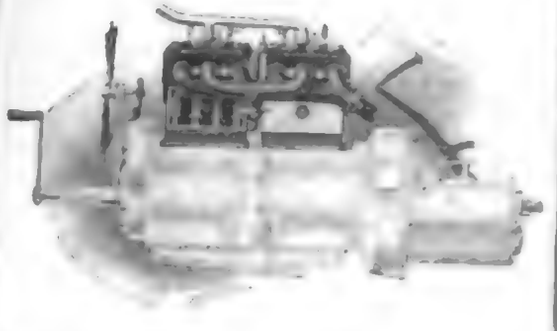
The Warm Hand Wheel sells at retail for $15. Write and let us tell you how well you will fare in the transaction.

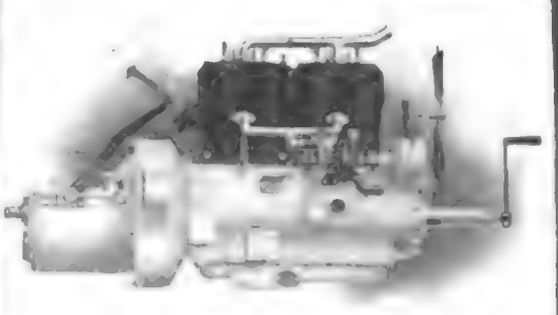


Driver Can Connect and Disconnect Current in an Instant

THE WARM HAND STEERING WHEEL COMPANY

527 Fifth Avenue **NEW YORK**





ERGON MOTORS

These Are Motors of Class in the Broadest Sense of the Word

We stand ready to convince you that, judged from any standpoint you choose, Ergon Motors are possessed of as much "class" as any motor built.

Powerful, durable, simple, accessible—and each of these attributes in degree seldom present, all in one plant.

Remember, too, that we are counting upon your making us convince you that these are not mere platitudes. We are counting upon your forcing us to show more real development and value in Ergon Motors than you can find elsewhere.

Just by way of opening the investigation we beg to say that Ergon Motors are of the unit power plant type, with Brown-Lipe dry plate clutch, and three speed selective transmission.

Four cylinder, four cycle, long stroke, 4⅜ by 6, water cooled, L-head, with cylinders cast in pairs. Valve side carries simply the gas manifold, which is a combination one-piece inlet and exhaust. Water pump and magneto on opposite side.

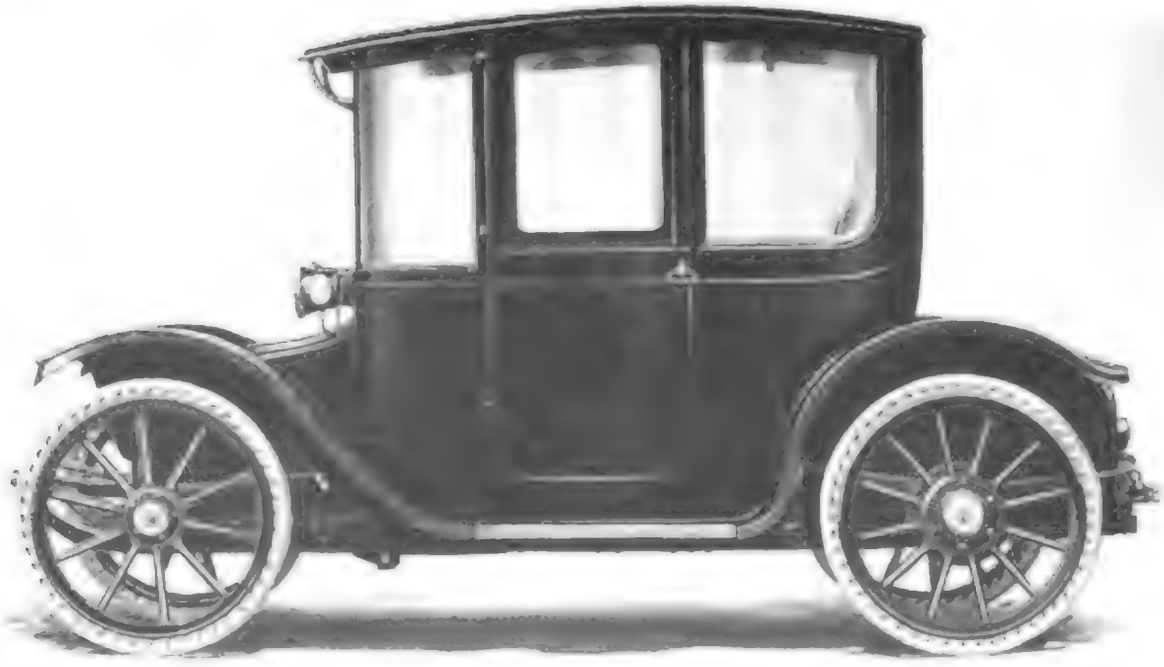
Renold silent chain drive replaces timing gears, and provision has been made for several electric or pneumatic starters. Timken bearings in the transmission; clutch supported on F. & S. bearings.

Just give us the opportunity to "sell" you on these motors. Give us a chance to show how great a factor of safety is present in every phase of construction and material.

And after we have sold you, we'll more than make good not only on the motors but on service and deliveries as well.

ROCHESTER HAZARD MOTOR MANUFACTURING CO NEW YORK

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The electric is distinctly the family car. The car for constant every day use—by every member of the family—under all sorts of weather conditions and for all occasions.

It is always ready—It is as easy to drive as a pony cart—And it has about it an atmosphere of luxury and comfort that is embodied in no other vehicle.

Century ELECTRIC

is an electric car among electrics—A car of distinguished personality—A car of superb proportions and simple elegance—

Its underslung body, scientifically suspended on long, flexible springs, makes it peculiarly an easy riding car.

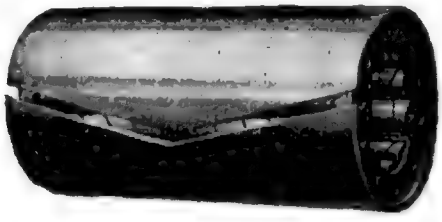
This car will be exhibited at the Chicago Show. We have not closed any Western territory and should like to get into touch with dealers capable of selling this high grade automobile.

If you can not see the Century at Chicago write directly to our Sales Department for detailed information.

Google



Hyatt Quiet Bearings



The Standard Type of the Hyatt Roller Bearing is designed with generous bearing length. This permits the rollers to operate directly on a steel shaft, thereby simplifying the construction.

The flexibility of the Hyatt Roller affords full line contact, hence an equal distribution of the load along the entire length of the bearing. Overloading at any particular point, causing excessive wear, is thus avoided.

The rollers of the standard type are now made of Chrome Nickel Steel, resulting in a greatly increased carrying capacity. Lubrication is positive—the rollers forming oil reservoirs. The right and left spirals distribute oil to every part of the bearing. Grit and dirt work through into the center of the hollow rollers, thus preventing grinding which would result in wear.

These are exclusive features of the Hyatt Roller Bearing.

HYATT ROLLER BEARING CO.
DETROIT, MICHIGAN

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KEETON
DETROIT, U.S.A.

The Six "48" Keeton Compares With the Best Foreign Cars!

This car is in a class by itself—simply because it is a combination of American and European ideas in engineering and designing, and is made in the economical American way. That's why the price is so low. That's why you get luxury and quality which would cost you nearly three times as much if you bought from an importer.

Here is a car that you are proud to drive anywhere. You have the utmost luxury and comfort—the distinctive appearance. And every detail of construction is of such high quality that the Keeton will give service second to no car in the world.

Compare this car with the best foreign makes—look them over carefully yourself. Go over them point by point and you'll readily see why the Keeton is the **real sensation** of 1913. Perhaps you say that such a car cannot be produced, even in America, for such a remarkably low price, but again we say, compare.

In fact the Keeton is a car of true foreign type, built to stand American road and touring conditions. It is unusually light for a car which will accommodate seven passengers, weighing only 3,350 pounds, a construction which enables it to stand the hardest driving over the most unsatisfactory roads.

You'll notice several features of the Keeton which are entirely new for American built cars. But when you consider them carefully their superiority is obvious. The radiator at the rear of the motor means perfect cooling, without drawing dirt and dust into the hood, and also eliminates the fan equipment. Then, too, the radiator is protected. The transmission and axle bearings throughout are imported annular.

Again we ask you to compare the Keeton—for it is only by comparison that you can realize the great value we are offering. We will make only a limited number this year, and, of course, your order should be in early. Let us send you booklet describing the different models.

Keeton Motor Co.

Detroit, U. S. A.

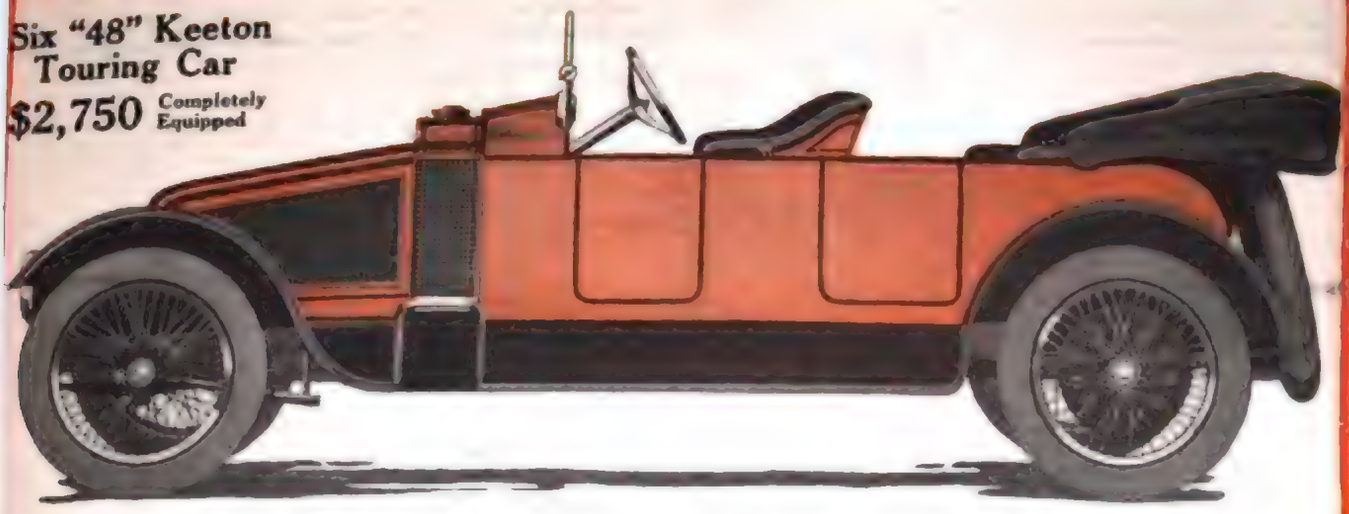
Six "48" Keeton Roadster

$2,750 Completely Equipped



Six "48" Keeton Touring Car

$2,750 Completely Equipped



An European Type---At An American Price!

Few people will deny that they consider foreign cars better in many ways than those made in this country.

They are distinctive and more attractive in design, and have several features of construction which mean more efficient service. But the only fault found is in the price, which is very exorbitant to most buyers, because of the methods employed by the European builders and the high tariff.

Now in the Keeton you have a car that combines the very best ideas both in construction and designing, that have been produced on both continents.

And you buy the Keeton, with these advantages, at the American price.

The Keeton car answers every requirement of those people who want a car of foreign design, yet who feel that they do not want to pay the high prices.

Electric Starting.

Full Electric Light Equipment.

Transmission—four speeds forward.

Wire Wheels—with option of Wood Wheels.

Chrome Vanadium Gears and Shafts on imported Annular Ball Bearings.

Extra Detachable Wire Wheel, or Extra Demountable Rim.

Long easy riding Springs—long wheel base.

Left Hand Drive—Center Control.

Small bore—long stroke motor of exceptional power and flexibility.

Radiator at rear of motor—in proper and protected position.

The only true French type of car built in America.

Best of foreign practice adapted to American road and touring conditions.

Complete Equipment

Electric starting and lighting system, with 12½-inch head lights; tail lamp with license holder; 80-mile Speedometer and eight-day clock combined with electric light; Lamp for changing tires at night, with extension cord; Dynamo electric Horn; Robe and Foot Rails; Silk Mohair Top, with self-contained folding curtains and slip cover; Double acting rain vision Windshield; Option of Wire Wheels with extra detachable Wire Wheel, or Wood Wheel with extra demountable rim; Wheel or Tire Carrying Irons; Full Set of Tools; Pump; Jack and Tire Repair Outfit, and all Touring Bodies will take Auxiliary Seats.

Three Excellent Models

Riverside Touring Car, 5-passenger, Completely Equipped	$2,750
Two extra folding seats for above	25
Meadowbrook Roadster, Completely Equipped	2,750
Tuxedo Coupe, Completely Equipped	3,000
Chassis without tires or rear guards	2,250

All Prices f. o. b. Factory. Booklet on Request.

TO DEALERS: It is needless for us to say that these cars are selling fast. Nearly two-thirds of our 1913 output has already been sold. And when we say sold we mean contracted and paid for.

This is the one distinct car—the one car that has a demand all its own. It is the one car that has no competition from American cars, because of the style and design, and none from the foreign cars because of the price. The Keeton car appeals to the buyer who is accustomed to the best—but who will appreciate a fair price.

The Keeton is selling fast wherever we are showing it. We already have dealers in many localities, and are considering applications from others. It would be well for you to write us about your local territory. We may already have a dealer lined up, but will be glad to hear from you anyway.

Keeton Motor Co. **Detroit, U. S. A.**

"How I Got Him Coming"

Being the words and language by which a Franklin dealer started a customer with the ENTZ STARTER

"Mr. B. W. Smith of my home city owns cars, both high priced, one a four and one a six. He has not bought a new car since May, 1911. I have seen him regularly, once a month, about five minutes per call and never did he show the slightest interest. When I received the Dealers' Bulletin announcing the ENTZ STARTER, Mr. Smith was one of the first men I called on. When I talked the starter he was interested, though I saw at once he knew but little about them. This is the conversation, after I got under his skin with the starter proposition, as nearly as I remember it:"

Myself—"Your big car you know has an air starter."

Mr. Smith—"That's heavy, isn't it?"

Myself—"Oh, not so heavy, but any air starter is quite a bunch of stuff. Electric starters are the only thing now. The ——— has the Delco; you have heard about their switchboard on the steering——"

Mr. Smith (interrupting—"What has the ———?"

Myself—"Acetylene; probably will have an electric. The Entz is just three things—starter, battery and switch. The switch controls both the starter and magneto. That——"

Mr. Smith (interrupting again)—"The battery fires the motor?"

Myself—"No. Could, I guess. But you don't want to go back to battery ignition. The magneto is separate but connected with the starter switch. You throw on the switch we have and leave it on until you want to stop the engine. The engine won't stall. Any magneto is always ready to perform its function as long as the switch is on, and so is our starter."

Mr. Smith—"I like our big car; it is——"

Myself (interrupting)—"I know, but you won't buy a car now without an electric starter."

Mr. Smith—"How does the starter make the lights?"

Myself—"Simplest thing you ever saw; you throw on the switch, that connects the battery, and the current from the battery runs the starter, the starter runs engine, the engine speeds up and runs the starter; when the engine runs the starter the starter becomes a generator and charges the battery, the battery furnishing the current for the lighting and starting."

Mr. Smith—"But your engine heats up; I have been told that it gets hot in the summer."

Myself—"I can believe that you heard that. But your own motor is cooled by air. The water goes through the engine jackets and back to the radiator where the air cools it."

Here Mrs. Smith, who was listening, interrupted and said: "The water boils, too."

world, who will get into his car in the morning and take a party to a city 350 miles away for dinner that evening."

Mr. Smith—"I guess you're right."

Myself—"And I know from my own experience that he could drive back again the next day and not be tired. You positively can not get comfortable riding without resiliency and flexibility. Both of your cars are built on a rigid plan; they are braced and made stiff. We drive through the springs."

Mr. Smith—"Drive through the springs?"

Myself—"Yes; and there are good engineers yet who say that driving through the springs is not practical. But foreigners are coming to this type of construction. The Peugeot, the fastest long distance racing car France has ever produced and which won the Sarthe Grand Prix last September, drives through the springs, and like our car has no radius or torsion rods. The motor of this French car develops 175 horsepower and its maximum speed is 120 miles per hour. Your cars are braced and made rigid in every way."

Mr. Smith—"Do your cars rattle?"

Mrs. Smith—"Our cars rattle something terrible now, and really, I don't think the springs act at all. There is no give. They bump terribly."

I was surprised to hear Mrs. Smith use the word "give." I had not used it, and decided Mr. Smith had told her that the cars had no "give," which caused bumping.

Mr. Smith—"The springs are rusty."

Myself—"Our front springs are the same as the rear; the whole car is easy."

Mr. Smith—"What power is that car out there?"

Myself—"Thirty-eight."

Mr. Smith—"I want more power."

Myself—"No, what you want is ability; you want to figure ability rating not power rating."

Mr. Smith—"What do you mean?"

Myself—"I mean get the ability of the car not just the horsepower."

Myself—"Yes. And you have no way to cool it except with air."

Mr. Smith—"But I have heard that your motor burns up."

Myself—"Those statements, I suppose, come originally from competitors. The best answer I can make you is that if they were true the Franklin Company would have been out of business long ago. In cars selling at $2,000 and up only two makers are selling as many cars as the Franklin Company."

Mr. Smith—"What's that?"

Myself—"That's right; only two high priced cars are selling better than the Franklin, and I don't think they are selling very many more."

Mr. Smith—"Is that so? You are third in cars over $2,000?"

Myself—"Yes. As for heating, I am ready at any time and so is any Franklin agent, to go into a cooling contest with any water cooled dealer, either fast or slow work."

Mr. Smith—"But it is when I run fast that my engine gets hot."

Myself—"I will take you out and run you any distance as fast as you want to ride; I will stop and lift the hood and you can lay your hand on any cylinder."

Mrs. Smith—"Does the heat from the engine spoil the paint on the hood?"

Myself—"That may happen, but it is not when you are running. It is when you stop and the heat from the engine radiates. But big cars now have special ventilators which you can raise and let the hot air out. This heat when standing still after running hard is the same on any engine."

Mr. Smith—"I am not as interested in long rides as I used to be."

Mrs. Smith—"It is tiresome to ride far."

Myself (to Mr. Smith)—"You have never had a real automobile ride; you don't know what it is to drive and ride in an easy car. My car out there has a reversible steering gear (I briefly explained the different types). Mr. Franklin, president of the Franklin Company, drives his car himself 300 to 400 miles a day. (I told him about Mr. Franklin's one-day trips the past summer as stated in the Bulletin.) I can say to you that there is not another automobile manufacturer in this country, and probably not in the

Mr. Smith—"How?"

Myself—"Horsepower times gear ratio divided by weight times wheel diameter; that will give you the ability of the car. I can show you very high-powered cars where the ability rating figures out only 68 per cent. as efficient as our little six thirty, because of their weight."

Mr. Smith—"What is your gear ratio?"

Myself—"Three and seven-tenths to one, but you have to take them all into consideration. Why, my car out there with Silvertown cord tires will play with either of your cars anywhere."

Mr. Smith—"You get good tire mileage?"

Myself—"The Silvertown cord tires are very efficient. They give you 20 per cent. more ability on hills. But——"

Mr. Smith—"They do? How?"

Myself—"Resiliency. (Explained in some detail about the Silvertown cord tires and that they cost more.) But you are glad to pay the difference."

Mr. Smith—"I would use up three sets of those tires going one hundred miles."

Myself—"I expect you would, but not on our car. Our 1911 owners reported an average of about ten thousand miles."

Mr. Smith—"Your springs help the tires."

Myself—"Yes, and so does the resiliency of the whole car."

Mr. Smith—"How much mileage do you get on gasoline?"

Myself—"With the thirty-eight our owners report fourteen to eighteen miles. Some owners even report as high as twenty with our seven-passenger car."

Mr. Smith—"What! If I get five miles with my ——— car, especially in hot weather, I am doing well."

Myself—"I know; our car is not a hard car to handle nor hard to ride in nor is it hard on gasoline or tires."

Mr. Smith—"Tell you what you do, let me take your car for two or three days; demonstrations don't interest me. I want to use a car long enough to see how I really like it. If you have a car that's being used I'd like to take it."

Myself—"I'll do that. I'll have a little six with starter before long and I'll turn it over to you. Good night."

I GOT HIS ORDER

"I got his order. When the little six with starter came, I drove out with him and then left the car and my man for him to use. I left them entirely at his service for two days. I instructed the man to let Mr. Smith drive whenever he would. The best part of the story is that I lost the car, for I had purchased it for a demonstrator and Mr. Smith wouldn't give it up. He found that 30 horse-power was ample in an ability car. But I'll sell him a '38' later just the same."

NOTE---The dealer who gave us the above was at the factory and told us the story and we had a stenographer take it down. Other dealers have given us accounts of some of their interesting experiences which we shall also print.

FRANKLIN AUTOMOBILE CO.
Syracuse, N. Y.
Without obligation on my part send me the Franklin Dealer Proposition.
Name .....
Address .....

FRANKLIN AUTOMOBILE COMPANY, Syracuse, N. Y.

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The SPARTON



Dimensions:
Length, 12 inches
Flare, 7¼ inches
6 Volts
Runson Dry Cells or Storage
Black enamel and brass or nickel bell

The First Electric Horn of Quality and Efficiency—At a Quantity Price

Big in Size—Big in Tone—Big in Value

To establish Sparton Value in your mind, compare it in tone, compare it in mechanical quality and efficiency; compare it from the standpoint of current consumption, appearance, size and finish, with the highest priced motor-driven horns. Then **compare prices.** The "Sparton" equals the best in quality, excels them all in durability and **its price is just about one-third.**

Quantity production alone makes possible "Sparton" Quality at "Sparton" prices. We have a capacity for producing 700 to 1,000 horns a day.

Two Styles Ready

Dash Type—In Black Enamel and Nickel or in Black Enamel and Brass.

Under-the-hood Type—In Black Enamel.

To Car Manufacturers

We are after "standard equipment" orders and can give immediate deliveries. We are setting a new pace for electric horn values. Write at once for sample horn and prices.

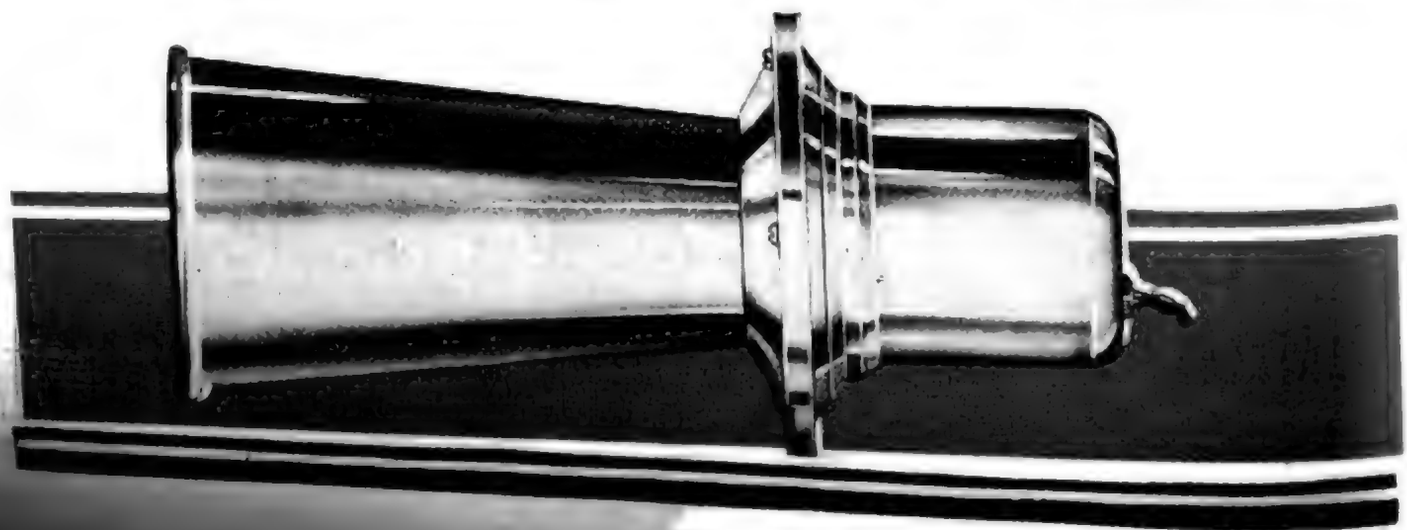
At Every Turn We Save You Profits That Every Other Manufacturer Must Pay.

We build our motors complete, manufacturing shafts and high speed bearings on high speed automatic machines; we stamp the laminations; wind both armatures and field coils; build a specially designed commutator; do all our own electrical work.

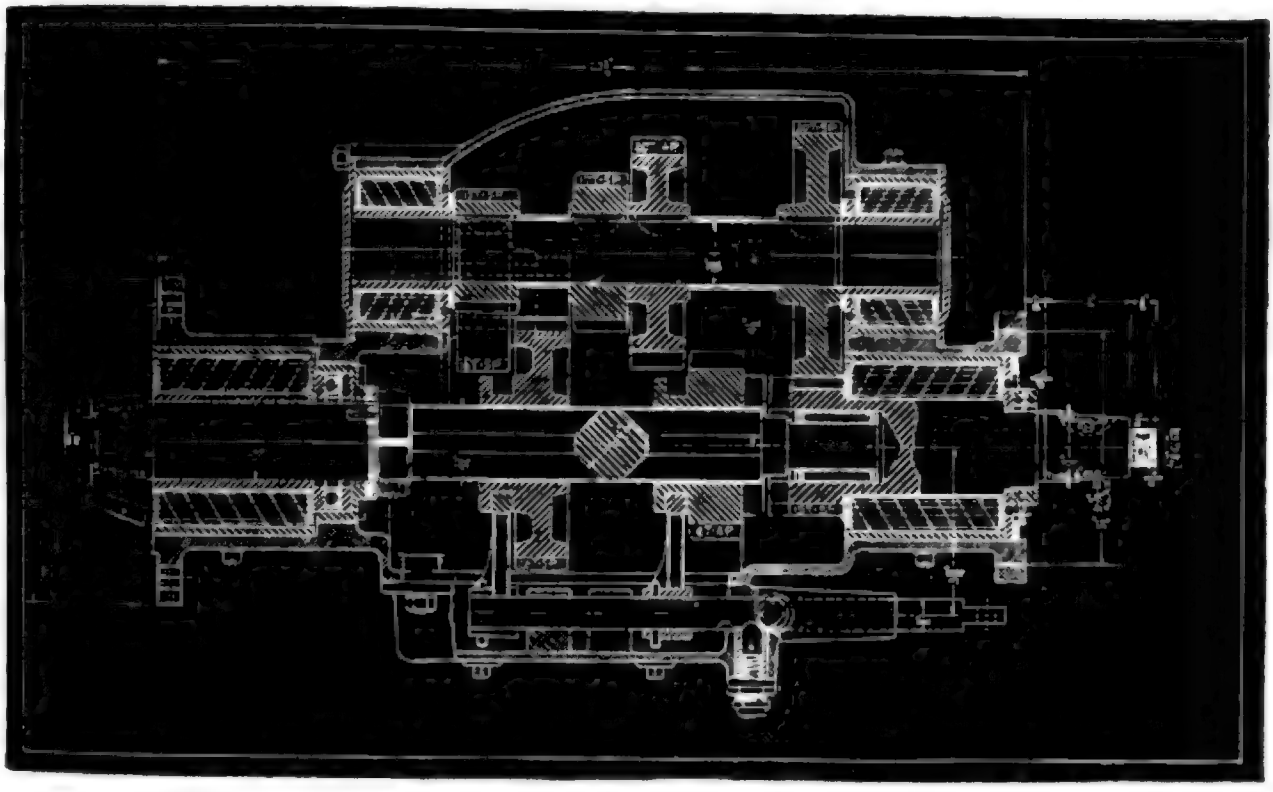
We stamp the bell, diaphragm holders, front and rear, diaphragms, diaphragm actuators, motor covers, push button springs and casings.

For all these operations other horn makers pay a profit to someone else.

The Sparks-Withington Co., Jackson, Mich.



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Covert Commercial Transmissions

FOR

1000 lbs.	Wagons
1 Ton	Trucks
2 Ton	Trucks
3 Ton	Trucks
4 Ton	Trucks
5 Ton	Trucks
6 Ton	Trucks
7 Ton	Trucks

We are Transmission Specialists---Jackshafts for the above models are supplied by the leading manufacturers

Covert Motor Vehicle Company

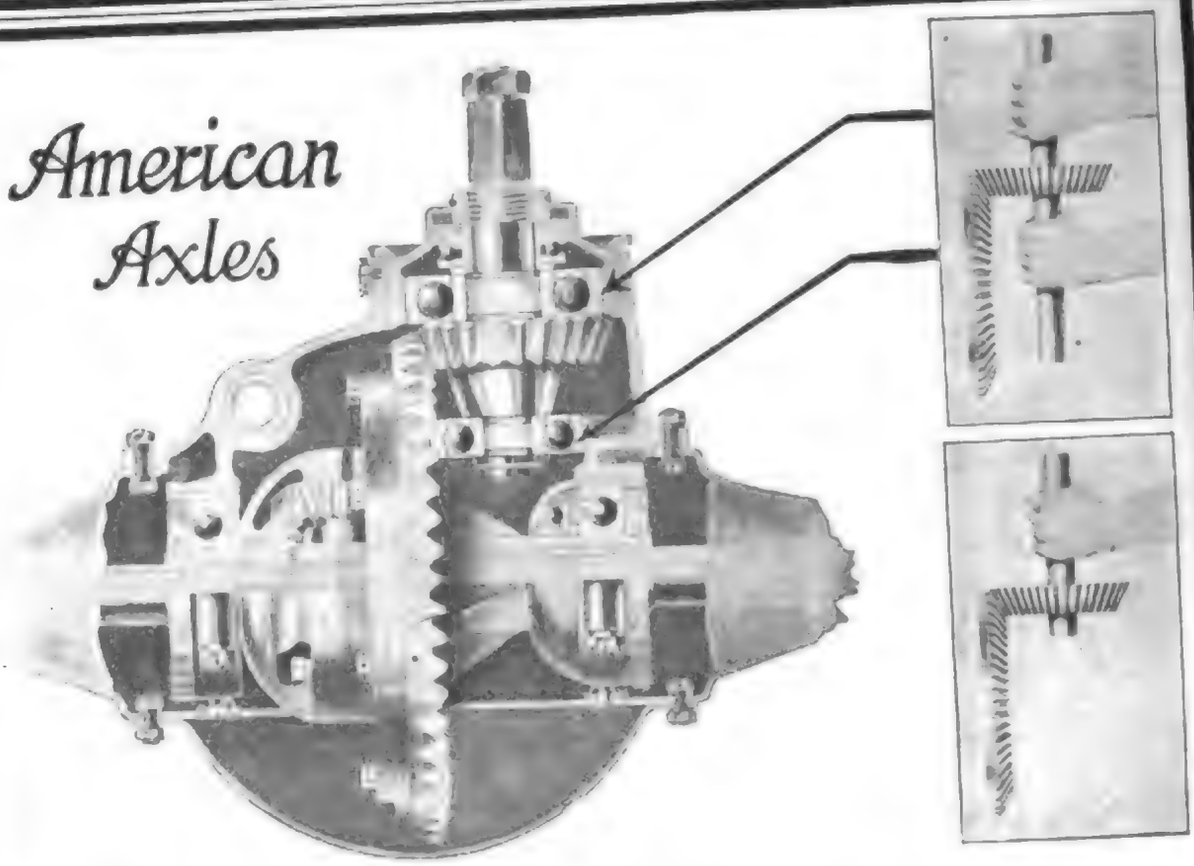
Factory: Lockport, N. Y.

Sales Office: 1422 Ford Building, Detroit, Mich.

COVERT COVERT

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American Axles



This High Class and Costly Construction Is To Be Found Only in American Axles

In *American Axles* of the bevel type, the pinion shaft has bearings on either side of the pinion.

The shaft has, therefore, the strength and security typified by the two strong hands in the small, upper illustration.

Cheaper construction omits the inboard bearing and endeavors to support the shaft in a one-handed fashion which proclaims its own weakness.

To add the inboard bearing, with its support an integral part of the housing, is much too costly practice for cars sold at the lower prices.

But for cars that must have the best of construction, the cost is more than justified in the continued maintenance of its originally perfect adjustment and the entire absence of noisy vibration.

American Axles equipment instantly establishes in your mind a sense of highest class: it supplies a basis by which you can unerringly judge a car.

NEW DEPARTURE BALL BEARINGS

American Made for American Trade

Gasoline Is Going Up----

and the users of motor vehicles are paying the bills. Abroad, where gasoline costs half-a-dollar a gallon, builders of automobiles use only ball bearings.

Why?

Because ball bearings are more thoroughly anti-friction than any other type. Friction scarcely exists in ball bearings, hence less power and less fuel are required to drive mechanism mounted on such bearings.

Other advantages are:

Minimum wear;

Maximum efficiency, endurance and dependability;

Ease of replacement;

Freedom from necessity of frequent adjustment—ball bearings are fool-proof.

The prospective automobile buyer will favor the car that will cost him the least to operate and maintain. This means he will favor the car that is equipped with ball bearings.

The American made New Departure ball bearings have no superior—are strongly guaranteed and perferred by the majority of American automobile manufacturers.

One such manufacturer says: "More real bearing value than I can get out of any other bearing."

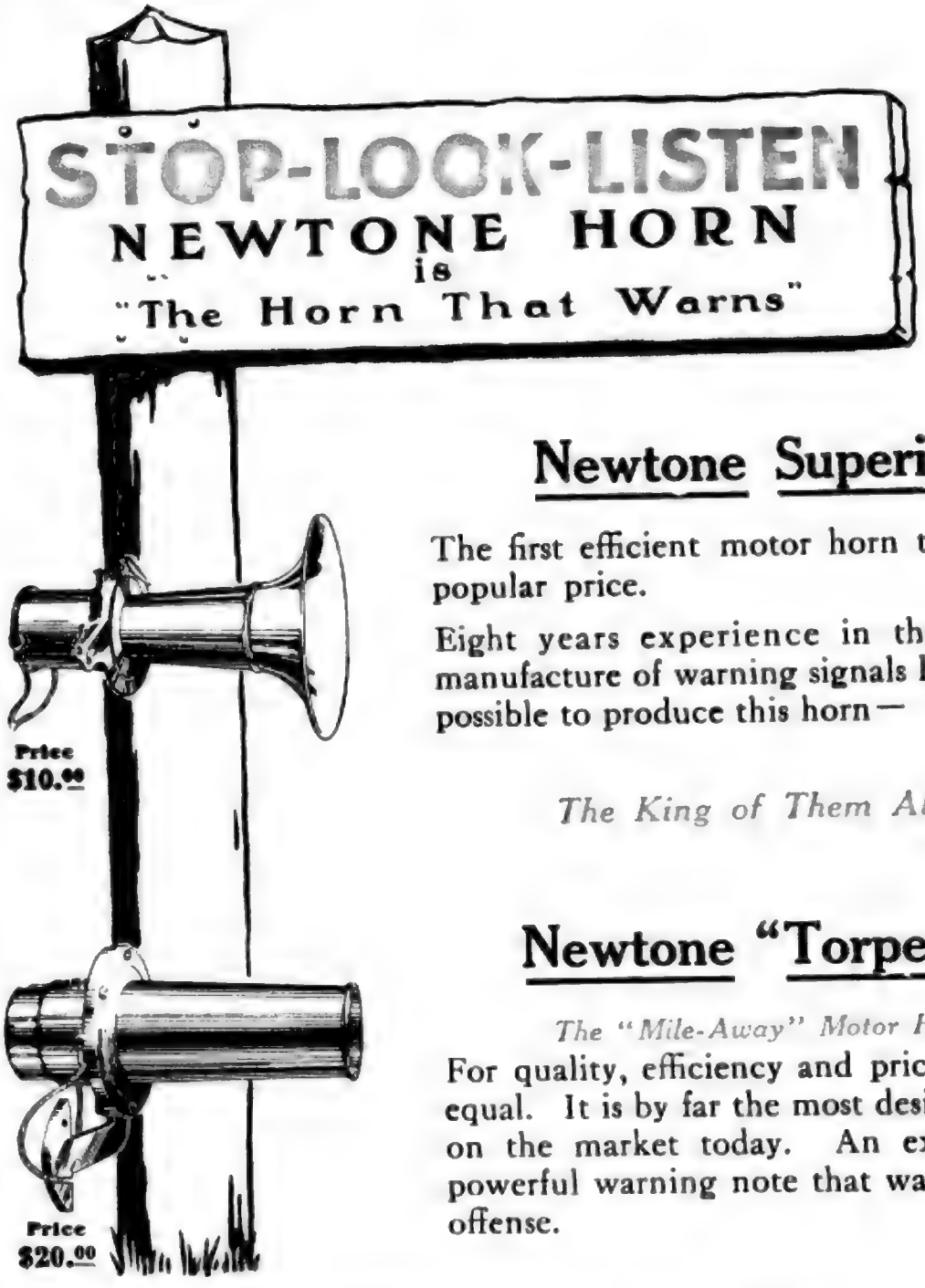
You are invited to visit our exhibit, Space No. 204, Balcony, Madison Square Garden

New Departure Manufacturing Company

Bristol, Connecticut

Double Row
Single Row
"Radax"

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Newtone Superior

The first efficient motor horn to sell at a popular price.

Eight years experience in the exclusive manufacture of warning signals has made it possible to produce this horn—

The King of Them All!

Newtone "Torpedo"

The "Mile-Away" Motor Horn

For quality, efficiency and price it has no equal. It is by far the most desirable signal on the market today. An exceptionally powerful warning note that warns without offense.

Manufactured and Guaranteed by the Largest Auto Horn Maker in the World

SEND FOR OUR CATALOGUE

Automobile Supply Mfg. Company, Brooklyn, N.Y.

This trade-mark of quality is HAYES MFG. CO. HAYES DETROIT, MICH. *on more than 250,000 boxes*

The Line of Beauty

Leads to HAYES Bodies



THE looks of a car have a lot to do with the sales. Looks are in the body—in the clear, clean-cut horizontal, the swelling curve of the rear seat back, the correct proportioning of shroud and hood, the graceful sweep of the fenders. The eye of the buyer notes these points before it goes deeper to motor and transmission.

Why Not Make the Most of It?

The Hayes organization has spent its entire career in the building of handsome automobile bodies and sheet metal parts. To your needs it can bring an unexcelled experience. Its engineers know bodies as your engineers know motors. They are at your service and the results of their experience is yours when you want it.

Let our engineers go over your blue prints. They will show you the short cuts and offer suggestions worth money to you. They will make you fenders, hoods, shrouds—anything in sheet metal that you want—that will prove a revelation.

You will save time, trouble and money. The Hayes organization will "speed up" your production; will stop your worry; will do the work quicker and cheaper than you can do it yourself.

Certainly this is worth investigating.



HAYES MANUFACTURING COMPANY
DETROIT MICHIGAN

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The First and Only Soot Proof Plug on the Market

MEZGER Soot Proof



Spark Plugs

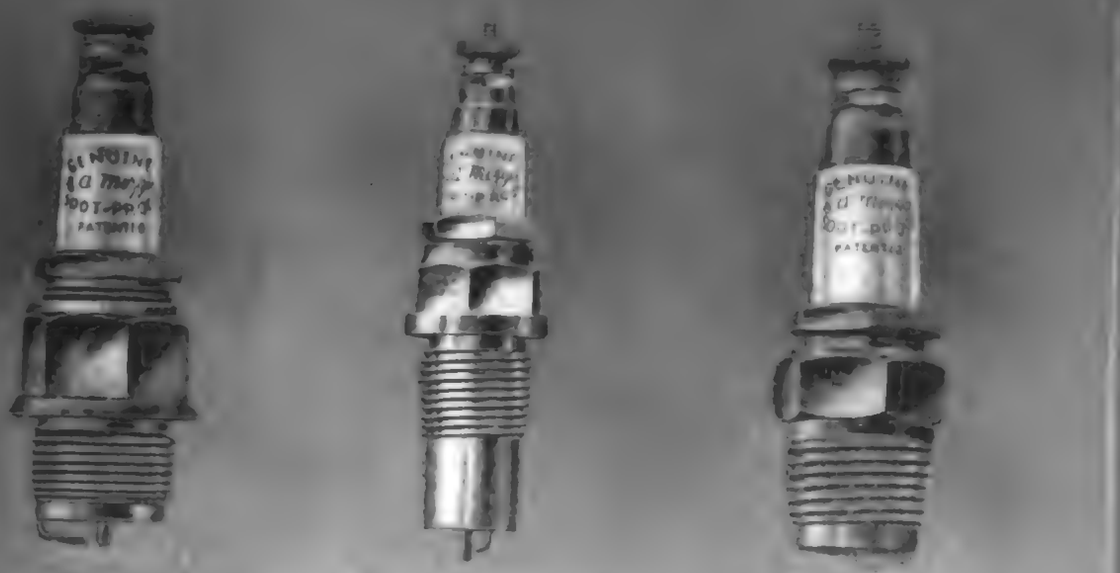
Can't Soot
Can't Short Circuit
Can't Leak
Can't Break Down

Over Two Million in Use

All Standard Sizes

And It Is The Plug You Mr Dealer, can Sell With Satisfaction To Yourself and your Trade

All
Stand
Size



The Spark Is the Life of the Engine

¶ On its vitality depends freedom from engine disorder—a partial short circuit gives the engine a weak heart— a complete short circuit stops its beating.

¶ Carbon or "soot" offers medium resistance to current. If the space where it collects in the plug is limited, then a leak or complete short circuit must follow.

¶ The greater the length of the carbon collecting space, the higher the resistance. Consequently, the spark jumps the air gap—as it ought to.

Send for Our Booklet

¶ It will prove through plain statement of facts that the Mezger Soot Proof Spark Plug has a much greater porcelain area—(in two annular chambers) than has any other spark plug. Therefore, carbon resistance is great enough to send the current across the gap as a healthy constant spark.

¶ You will also be shown why this plug is actually self cleaning—why it is gas tight and why it will prove an all round, permanent, healthy part of the ignition system.

¶ DEALERS—get the big message—it's well worth reading.

C. A. MEZGER, Inc.

15 Canal Place New York Bronx Borough

The UNITED STATES DUNLOP (Straight side) TIRE

is the premier automobile tire of the world



Easiest Tire on the market to put on or take off.

Fits any Q. D. rim.

See this tire at the Garden Show, Space 124

Cannot Rim-cut, of Course

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IT'S KNOWN BY ITS 4 BIG FEATURES

Model B
$50

Our magnificent new 1913 instrument is an example of highest development in the construction of a

Magnetic Speedometer

The magnetic principle is the only scientific principle of speedometer construction. It is—by far—the most costly construction. The magnetic principle—alone—permits the use of a frictionless indicating means and of low speed, non-vibrating drive.

THE NEW 1913
Stewart Speedometer
Has Four Splendid Features

The New 1913 Stewart Speedometer has the new "reversed" revolving Speed Dial with Zero Stop mounted on full jeweled bearings and operated by Tungsten steel magnet, Stewart "closed ring" type. Steady and accurate at all speeds. Read at a glance

It has a big, sturdy 100,000-mile Season Register, operated by "direct drive" gears and controlled by "Geneva Stop" mechanism.

It has a 100-mile Trip Register that can be rapidly reset to any tenth of a mile and without disturbing the record of the Season Register. This is an excellent feature for motorists when following instructions of route book while touring.

It has the Grade Indicator with revolving dial mounted on polished bearings and operated by gravity. Shows the various percentages of grades from zero up to 30 degrees.

IF YOU DESIRE PERMANENT SATISFACTION SEE THAT THE MAGNIFICENT NEW 1913 STEWART SPEEDOMETER IS INSTALLED ON THE CAR YOU BUY

We Threw It Away!

Our Old Centrifugal Type Speedometer

The first speedometer we made was of the centrifugal type—but long ago we cast it upon the scrap heap of the obsolete—

—because the governor of a centrifugal instrument must revolve at a high speed of over ***two thousand five hundred revolutions*** to the mile, causing vibration and bearing friction that no instrument can stand.

—because the centrifugal type ***will not indicate*** any speed under 7 miles an hour!

—because continued accuracy with a centrifugal type of speedometer is utterly impossible. It is necessary to multiply the movement of the indicating means ***sixteen times*** in order to get a movement of the pointer hand sufficient to permit the use of a scale large enough to be readable. ***Therefore, any error in accuracy is multiplied sixteen times!***

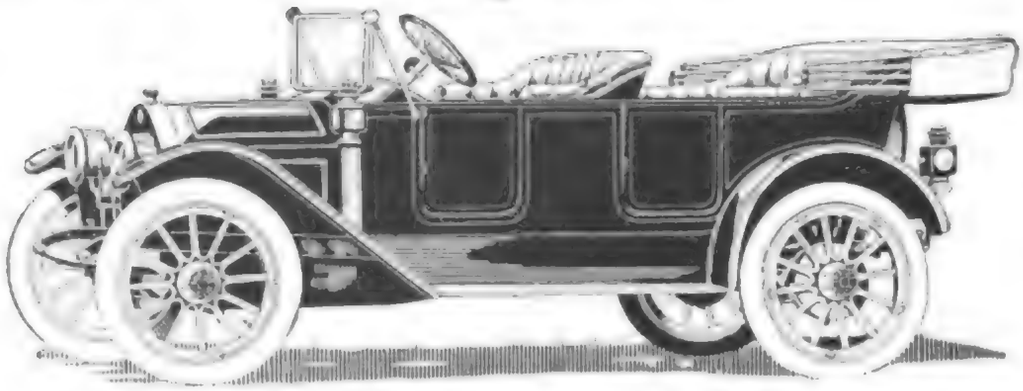
—because our new and perfected type of MAGNETIC speedometer has rendered all types of centrifugal speedometers crude and obsolete!

Stewart-Warner Speedometer Corporation

Factories at Chicago and Beloit
General Offices: 1928 Diversey Blvd., Chicago

New York Philadelphia Denver Los Angeles Indianapolis Pittsburgh Chicago Cleveland Portland Minneapolis Boston Seattle Kansas City St. Louis Toronto Atlanta San Francisco Buffalo London Detroit Cincinnati Paris

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EMPIRE

"The Little Aristocrat"

Model 31

Style, Distinction and Character in every line. Power, Speed and Strength to match the Design.

Completely Equipped $950

108 in. Wheel Base	Demountable Rims	Double Tire Irons	Speedometer
Mohair Top	Windshield	Prest-O-Lite Tank	Extra Rim
Top Envelope	Robe and Foot Rail	Head, Side and	Jack and Tool Kit
Storm Curtains	Oversize Tires	Tail Lamps	Eisemann Magneto

THE $950.00 completely equipped EMPIRE Five Passenger Touring Car meets the demand of those who know car values. Everywhere it is winning its way with expert motorists who demand a car of moderate size and price, and insist on having a real car, built of quality materials and honestly constructed.

WE knew that in time "The Little Aristocrat" would come into its own kingdom. We foresaw increased demand. But it was gratifying to have been compelled to establish a second factory.

We want you to know the EMPIRE. Examine "The Little Aristocrat." Learn why it has won, why it satisfies.

See the Empire

Special Chicago Show, February 1st to 8th

RALPH TEMPLE AUTO COMPANY

1221 Michigan Avenue Chicago, Illinois

Write for New Descriptive Catalog

Empire Automobile Company, Indianapolis, U.S.A.

SWINEHART TIRES

Show You How to Save Over 30 Per Cent. of Your Tire Cost

This Non-Skid tire (Depression Type) is one that actually makes skidding *impossible*. The real skidless tire.

This then saves the cost of chains which average 20 per cent. of the cost of a casing—in addition to eliminating the chafing and tearing away of 20 per cent. of the life of the casing.

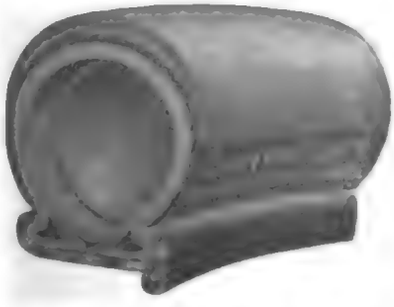


All made by the two cure, wrapped tread process—the most approved method.

Types — Clincher, Q. D. Clincher, Straight Side.

A TOTAL SAVING AVERAGING FROM 30% TO 50%

Thousands in use. Approved and adopted on cabs of seven leading taxicab companies in New York City.



Swinehart Smooth Tread Tires, made by wrapped tread, two cure process, the most approved method.

In Clincher, Q. D. Clincher and Straight Side Types.

They are made of the best materials throughout, which an examination will show, and a test will prove.

They never skid and they never wear chains.

Four times more wearing surface than any other non-skid. No buttons or projections to cause fabric trouble and their non-skid efficiency is good for two to three thousand miles, two to three times more than you get from others.

It pays to use **non-skids—good non-skid tires. Swinehart Non-Skids.**

Exhibit, Elevated Platform, Space 170, Madison Square Garden

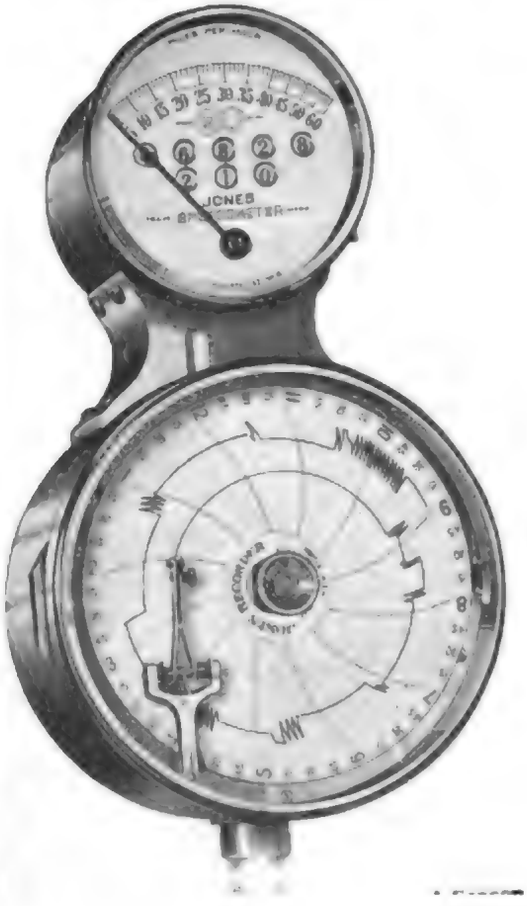
The SWINEHART TIRE & RUBBER COMPANY, Akron, Ohio

New York, 1924 Broadway
Boston, 727 Boylston Street

Chicago, 1720 Michigan Avenue
Philadelphia, 320 N. Broad Street

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Jones Spe



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Jones Spe

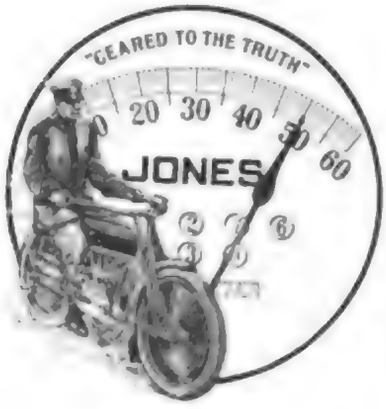
will be privately exhibited during Show Week at the Prince George Hotel, 27th Street between Madison and Fifth Avenues, as we have been unable to secure adequate space at the Madison Square Garden.

Any dealer in automobile supplies will be glad to show you his complete line of Jones Speedometers.

Googl

Speedometer

mplete Line of Speedometers



THE JONES—Centrifugal—SPEEDOMETER employing the same principal as the steam engine governor, is not affected by changes of temperature, or by the powerful magnetic influence of the electric system of lighting and starting now so generally used.

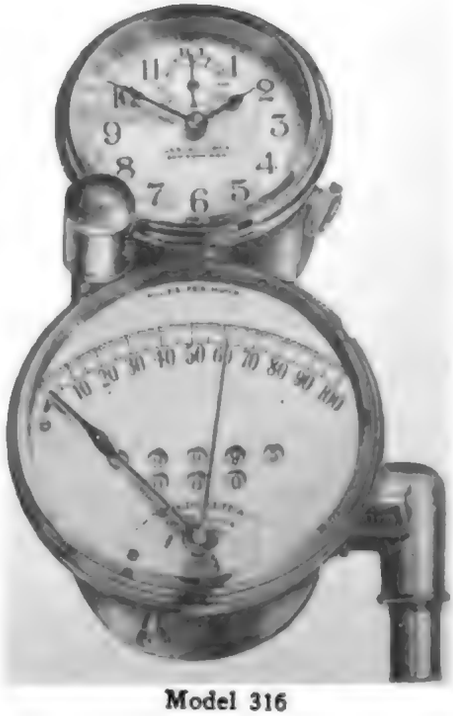
The Jones Speedometer, Bush Terminal, N. Y. B'way and 76th St., N.Y. City



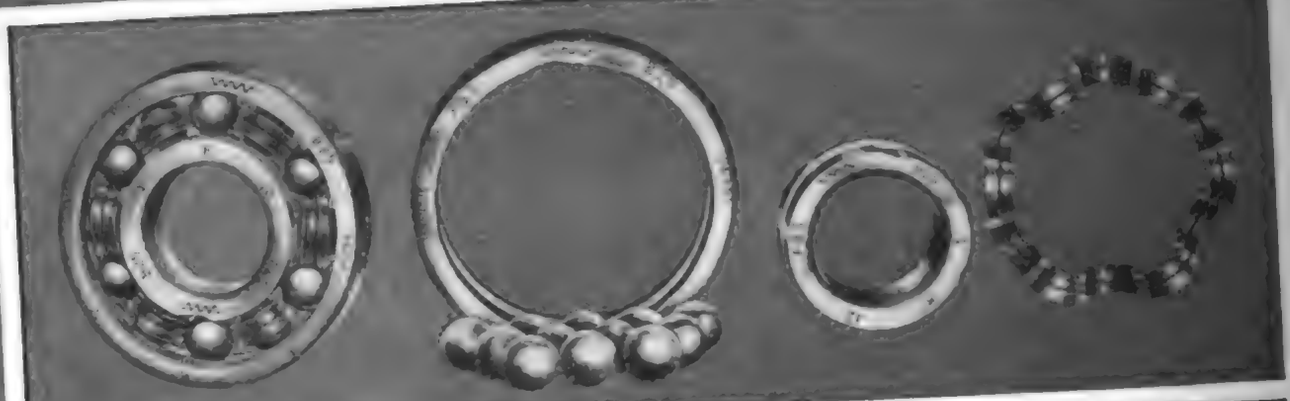
Model 29
$25



Model 40
$50



Model 316
$105



"ALL THAT WILL BE MENTIONED, therefore, are the requirements which a good ball-bearing cage must meet:

(a) As small a space as possible between the balls, so that the maximum number may be put in; (b) To guide them well and safely; (c) To eliminate parts which may get loose, i. e., to make the cage if possible of one piece; (d) To use material which is not too soft, so that the cage will not wear out quickly;

(e) To avoid excess weight; (f) Solid elastic material to sustain shocks without breaking;

(g) Construction such that no parts can get between or under the balls and wedge them in case the cage breaks; (h) Or, should the cage break, the work of the bearing will not be disturbed;

(i) Quickly putting into or taking cage out of bearing; (j) Ready access for the lubricant to the balls and raceways;

(k) To eliminate pockets in which foreign substances can become lodged and act as a brake on the balls; (l) To expose the balls so that the bearing can be cleaned and examined without taking it apart."—FRANZ J. JAROSCH, M.E., MEMBER OF S.A.E.

BRETZ COMPANY

SOLE IMPORTERS

250 West Fifty-fourth
New York City

1913 F&S Blue Ribbon Retainer is "Sui Generis"

Meaning "the only one of its kind"



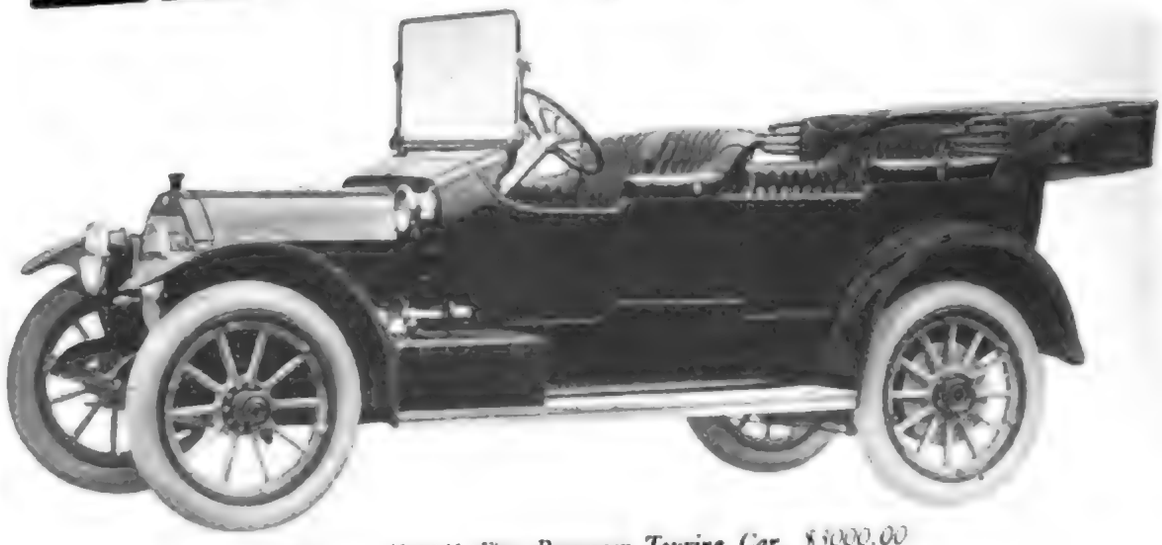
"IF ALL THE DIFFERENT KINDS of ball-bearing cages used are examined with reference to the qualities mentioned, the conclusion is reached that these qualities are best combined in a construction as shown."

"If the frictional relations and the distribution of the load are observed, the sum of the main factors of the permissible load—the number of balls times the size of the balls—is compared in the various ball bearings on the market, the qualities of the ball cage necessary are looked into, and if finally these ball bearings are examined with reference to material, precision in their manufacture and durability, it will soon be discovered that the ball bearing shown, made by FICHTEL & SACHS, Germany, possesses the best qualities in every respect and must be put at the head of all other radial ball bearings."—ADDENDA BY FRANZ J. JAROSCH, M.E.

F & S Ball Bearings

"The Easiest Riding Car In The World"

THE MARMON



Marmon "32" Five Passenger Touring Car, $3000.00

The Man Who Knows

Have you noticed the **change** in the automobile business?

A short time ago it was a question of selling a car to a man who knew nothing of automobiles—of their construction—of the **true** meaning of service.

Price was the first great question—or perhaps a car sold on its **appearance** alone—or because of its **equipment**—or because of one or two features that struck the fancy of **the beginner.**

Today the greatest proportion of buyers **know** the **real, vital propositions** that go to make automobile value. **One half** the buyers of automobiles have already owned a car.

You are selling to **"The Man Who Knows."**

The greatest percentage of today's buyers **know** how to size up a car—**know** how to judge its design, its construction— **know** it from the **actual** service it has given.

There lies the unequaled **advantage** of the Marmon. It is backed by the **prestige** of the Marmon name. The **superiority** of its design and construction is acknowledged everywhere by experts. Its records in the world's greatest contests have **proven** its unequaled durability. Its records of service in the hands of owners have **strengthened** and **added to** its reputation

The more a man **knows** about automobiles the more he will be **impressed** by the Marmon in every feature.

Such a car **cannot be assembled** even from the best products of several manufacturers. It must be designed and constructed **complete** by one organization with extraordinary care and thoroughness **in every step** of its manufacture from the skilled engineer's drawing and the raw material to the completed car.

Nor can such a car be turned out **by the thousands** to meet the low initial price required by the **inexperienced** buyer.

Sixty years of experience in the manufacture of high class machinery, sold in every part of the world, have taught us that there is but **one** way to construct a machine to give **constant** service. The fruit of this experience is the **high standard** of Marmon construction.

You, who buy cars, know as well as we, who **make** them, that there is but **one** way to give satisfaction in an automobile—and that way is to make it, with every care, for years of service.

You wise buyers—"The Men Who Know"—are looking forward into the future. The day of the car with Marmon reputation behind it and Marmon service in front of it is just **dawning.**

The Marmon "32"

32-40 h.p., 120-inch wheelbase, dependable electric starting and lighting system, left-hand drive, center control, nickel trimmings, with newest body types to meet every requirement and corresponding equipment—

$2,850 to $4,100

The Marmon Six

48-80 h.p., 145-inch wheelbase, dependable electric starting and lighting system, left-hand drive, center control, nickel trimmings, with body types to meet every requirement and corresponding equipment—

$5,000 to $6,350

Detailed Information on Request

Nordyke & Marmon Company

Indianapolis **(Established 1851)** **Indiana**

Sixty Years of Successful Manufacturing

NATIONAL AUTOMOBILE LOCK WASHERS

STANDARDIZED QUALITY THAT COUNTS



SECTIONS AND PATTERNS SHOWN IN PANEL HAVE BEEN ADOPTED BY THE SOCIETY OF AMERICAN ENGINEERS

The lock washer is a small car part with a mighty big mission. It is evident that this is not realized by the purchasing departments of car factories, for in this item the order usually goes down—"[illegible]"

The lock washer is the bond of the units. If it lacks design, proper resiliency, and resistance to fatigue, then it can destroy alignment of bearings and create small and grave troubles in various parts—and the loose nut with the inefficient lock washer is usually eliminated from trouble possibilities when it should be traced to this obscure but most important part of the car.

The responsible purchasing head (the one we want to reach) will order lock washers that will insure security of parts—and he won't hesitate on a few-cents-per-car-difference.

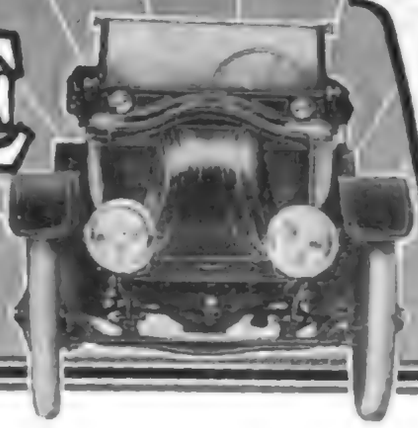
To such we demonstrate the positive superiority of National Lock Washers. They will give 100% service in security and length of life.

THE NATIONAL LOCK WASHER CO.

Chicago, Ill. **Newark, N. J.**

McCUE WIRE WHEELS





New York newspapers, in a forecast of the automobile shows, lay great stress on wire wheels as a coming refinement for 1913—**notably** the **only radical departure** from established practice in the whole group of changes, which reflect mainly body design and starting devices.

WIRE WHEELS ARE HERE TO STAY. They are just as certain as was the four cylinder motor in days of one and two cylinder design.

McCue Wire Wheels are slowly but surely cutting into the tire industry and this is but logical and right, because your customers, Mr. Dealer, have every right to have their pocket books protected by **you**—and by ourselves **They** are not interested in rubber stock and dividends.

McCUE WIRE WHEELS

Increase Tire Life From 50 to 70%

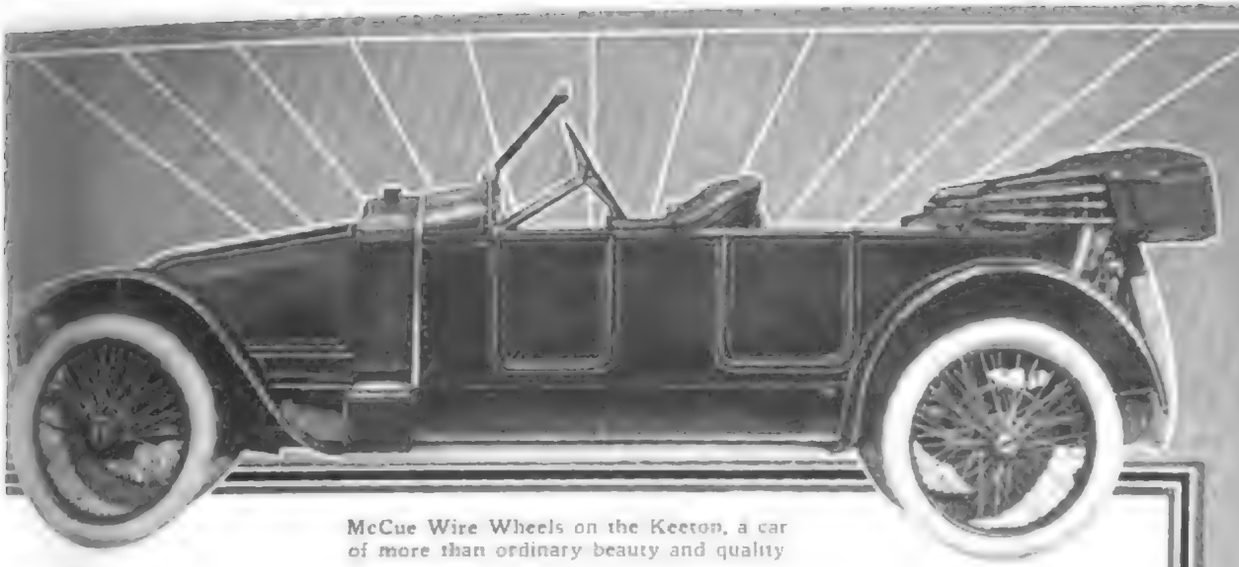
a fact so plain that tests to prove it were scarcely necessary—although we have made many of them.

McCue Wire Wheels reduce the terrific pounding at point of tire contact, to a "tack hammer" blow, as it were, because the greatest weight of the wheel is at the hub—the lightest at the periphery or point of road contact.

You can strike a terrific blow with a ten pound hammer if you grasp it by the handle—but you can't do execution if you grasp it by the head and use the end of the handle as the striking point. The "hammer head" of the McCue Wire Wheel is the hub—the light end of the "handle" is the rim.

And it's this pounding that drives the life out of the tire, and takes away hundreds of miles of usefulness. Then the car owner "digs" for more tires—or sells his car in disgust.

On high speed, McCue Wire Wheels again conserve tire life by metallic radiation of frictional heat as fast as it develops—another dollar saving feature.



McCue Wire Wheels on the Keeton, a car of more than ordinary beauty and quality

We discard the demountable rim as radically wrong, because it increases weight at the point where weight must be held at a minimum. This is why McCue Wheels are detachable. It's as easy to carry this wheel as it is to carry a rim—and it's even easier to attach.

Where do you stand in this matter, Mr Dealer? Are you going to continue to accept and sell cars with wooden wheels, long after the public knows of their awful appetites for tires—are you going to let competition invade your territory "wire wheel equipped"?

Or are you going to use your influence with your manufacturer—and get there first?

McCue Axles

represent the best in axle making, material, design and workmanship. All combine to give maximum service under all conditions of road shock, side thrust and load.

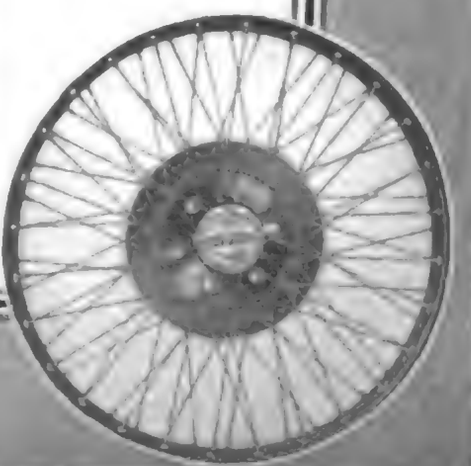
If your customers want wire wheels, you write the manufacturer for inner hubs and wire wheels to go on the particular model to be so equipped. We are situated so that we can meet this demand for the manufacturer.

THE McCUE COMPANY, Buffalo, New York

The (S) brand of steel wire automobile spokes is used in McCue Wire Wheels. Both spokes and nipples are made by The Standard Company of Torrington, Conn.

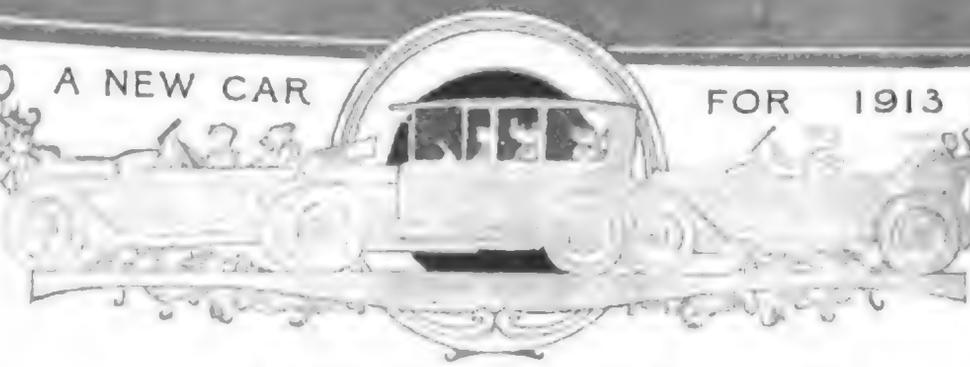
The (S) spokes are made from special drawn carbon stock of exceptional tensile and torsional strength combined with extreme bending qualities.

The Standard Company as an allied company of the Coventry Swaging concern is able to secure wire of standard set by the English concern.



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A NEW CAR FOR 1913



EDWARDS KNIGHT

A Great Achievement!

A NEW domestic car which in material, equipment and design equals the best cars on the market regardless of price.
This is the achievement of C. G. Stoddard and H. J. Edwards—men of long and successful experience in the automobile industry—who offer the Edwards-Knight as a car in which no detail of perfection is lacking, a car which is "up to the minute" of motor car excellence.

Edwards-Knight Engine—Silent, powerful, flexible, economical. Shaft Drive with Worm Gear. Electric Lighting and Starting Device. Unit Clutch and Transmission. Power Tire Pump. Bodies of most graceful lines and perfect finish. Cantilever Springs and Wire Wheels make it the easiest riding car in the world.

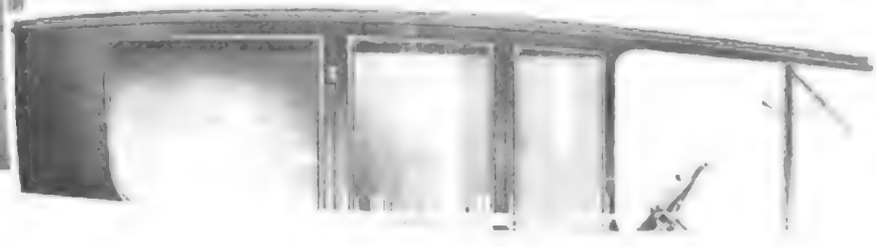
Touring Car	**$3500**	**Roadster**	**$3500**
Torpedo 4 Pass. . . .	**3500**	**Speedster**	**3500**

Every Car is Fully Equipped

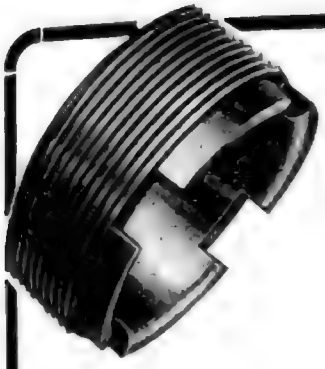
The Edwards-Knight is unique! It commands careful consideration. Booklet containing fuller particulars sent on request.

EDWARDS MOTOR CAR CO., 1790 Broadway, New York City

Show Room Entire 4th Floor — Telephone Columbus 1732



Limousin $4600 Fully Equipped

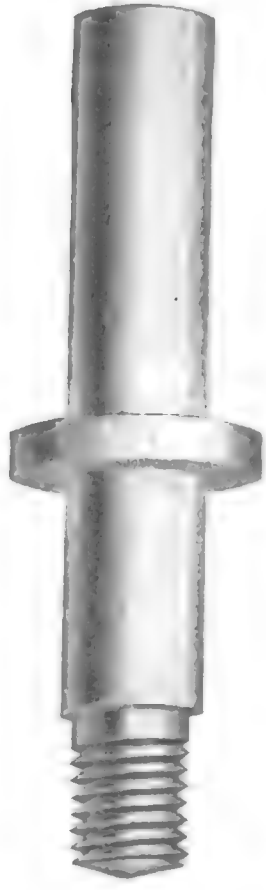


LOWER COST
ON MOTOR TRUCK PARTS



UNIFORM accuracy in large screw machine parts saves time in your assembling, and increases the value of your car.

Driving shaft, radius and connecting rod parts, axles, brakes, etc., for motor trucks are just a few of the NAMCO parts now being used by many builders of trucks. The number of machines in our factory running continuously on work of this character has doubled in the past year. This shows that more manufacturers are realizing the value of accurate product coupled with a service made efficient by a splendid equipment and a thorough knowledge of trade requirements.



Let us have your samples. Our quotations are based on practical knowledge and will be right. Ask for "Special Milled Products" book, it shows many truck parts made in our factory.

THE NATIONAL-ACME MANUFACTURING CO.
AUTOMATIC SCREW MACHINES AND THEIR PRODUCTS

SIXTH CLEVELAND CITY

NEW YORK 77 White St. | CHICAGO 23 So. Jefferson St. | BOSTON 141 Milk St. | DETROIT 1222 Majestic Bldg. | MONTREAL In St. Henri at G. T. R. | ATLANTA 3rd Natl. Bank Bldg.

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STANWELD Rim No. 30 is designed for those who require a demountable rim of minimum weight and extreme simplicity.

It has both the quick detachable and demountable features and is made in two styles, one for straight side tires and one for clincher.

This rim is split circumferentially, the two sections having corresponding lugs that are locked together by two semi-circular rings. One end of each ring is securely rivited to the wider portion of the rim base. The free ends of these rings are secured by a swinging latch which is in turn locked by a cam latch.

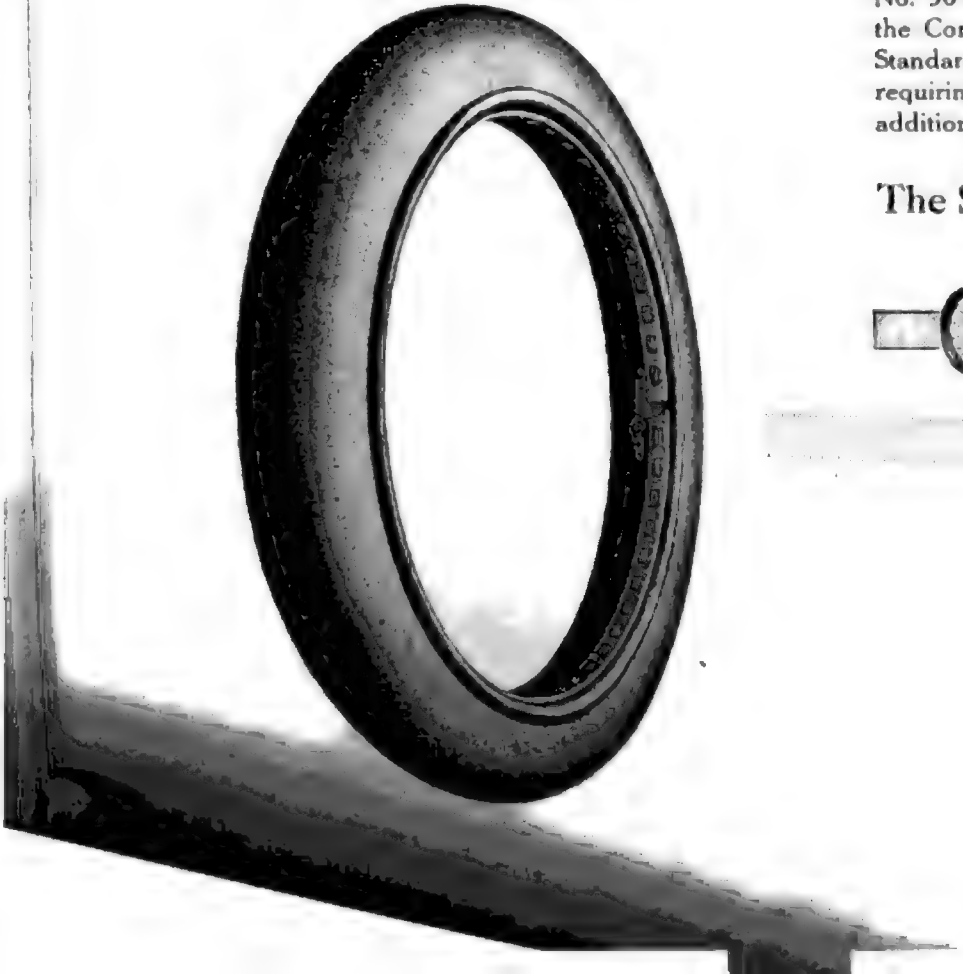
No special tools are required to operate this rim and no circumferential movement of either section is necessary to disengage the two parts of the rim base.

The rim base of **STANWELD** Rim No. 30 will fit the felloe band of either the Continental Gilbert type rim or the Standard Universal No. 3 rim, without requiring any special wheel work or additional equipment.

The Standard Welding Co.

Cleveland, Ohio





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STANWELD demountable rims, series No. 40, stand alone in their pre-eminent efficiency.

Universal in their acceptance of tires, automatic in their mechanical operation, combining both a quick detaching and demounting feature which operate independently, and positively preventing wobbling of tires, they surmount all the defects of former types of demountable rims.

STANWELD rims, No. 40 series have an entirely new feature for the securing of the rim base to the wheel —The adjusting ring. This device is an intermediary band that lies under the entire rim base and supports it at all points of the front and rear circumference.

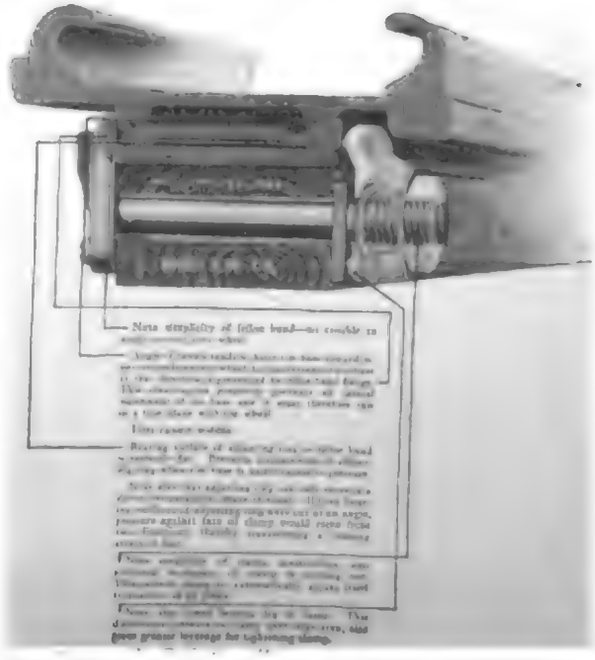
The rim base has the felloe band flange as a guage for its lateral position and must always lie in the same perfect position on the wheel no matter how the clamping devices are tightened. This is the preventive of tire wobbling, one of the prime reasons for excessive tire expense.

Number 40 STANWELD rims are the wheel equipment on all leading makes of cars.

The Standard Welding Co.

Cleveland, Ohio





Advertising that is 100% Efficient-

HOFFECKER SPEEDOMETERS



The wife of John Wesley, founder of Methodism, once asked him why he preached a certain sermon so often.

He answered, "Because, Susanna, once telling is not enough"

We are again emphasizing the value of sane, rational, telling advertising as it makes for quality of Hoffecker-Waltham products and for demand that strikes home to the manufacturer and gives force to the dealers' recommendations.

Hoffecker Speedometers and Waltham Time-pieces are master works of master minds. They are made from designs and built of materials that insure the car owner absolute accuracy and many years of service without the loss of one iota of reliability.

Cost of production is higher than that of any other similar combination —but we put cost of production **above** cost of selling—in other words, we give the car manufacturer the best speedometers and time-pieces that can be built and at prices within reason.



The money usually spent in this line for "one shot-in-a-hundred" advertising is spent by us in salaries, equipment and material.

This is a repeated message of square dealing with the car maker, the dealer and the car owning public. **We want it to sink in**

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What it means to you and your Trade



WALTHAM TIME PIECES

You, Mr. Dealer, serve your own best interests when you use judgment in the recommendation of accessories. In these days the man who buys a car, buys much more than chassis, wheels and body. He **wants** to buy **quality** in **all** of the smaller necessities and luxuries. He looks to **you** as the expert to help him out.

Dealers are the final arbiters of demand. Manufacturers look largely to them as the men with fingers on the pulse of demand.

We are advertising Hoffecker-Waltham quality to several hundred thousands of readers of the Automobile, Motor Age and Motor, (double page spread shown here), all publications that go to those who are directly and vitally interested as car owners and prospective car owners. It's Simon-pure, strong advertising that is the final link connecting up the man who makes, the man who sells and the man who buys cars.



We are putting the best speeedometers and time-pieces in the world before the trade and public in an inexpensive but telling way. If you want specific details to back your arguments, write to either factory and you will receive positive proof that these instruments of permanent precision well justify you in recommending them to your trade and in specifying them on the cars you sell.

What Shows Don't Show

By R. E. Olds, Designer

You'll see the new model of Reo the Fifth at your local Automobile Show.

It will strike you as beautiful, luxurious, roomy—having every final touch.

But here are things you can't see. And they mean, in the end, more than all that shows.

Tire Mileage

Tires on a car form the chief item in upkeep. Tire-saving means more than all other savings together. Every old motorist knows this.

So this year I add 30 per cent to my tire cost, to add 65 per cent to the average tire mileage. I give you tires 34 x 4. Compare them with rival cars.

The usual tires on this type of car would more than double your tire cost, so tire makers say.

No Possible Flaws

The steel in this car is twice analyzed, to make sure it accords with my costly requirements.

The gears are tested in a crushing machine, to prove that each tooth will stand 75,000 pounds. This test is usually made with light hammers.

The springs are tested in another machine, to stand 100,000 vibrations.

I use in this car 190 drop forgings. The average cost is twice that of steel castings.

But they give me lightness and strength. And hidden flaws can't occur in drop forgings.

The various parts of this car get a thousand inspections. Thus all the uncertainties are completely eradicated in building this Reo the Fifth.

No Broken Bearings

I use in this car 15 roller bearings, 11 of them Timken, 4 Hyatt High Duty.

They cost five times as much as the usual ball bearings. But good roller bearings don't break under strain.

No Overtax

It's the sudden shock which shows up a car's weakness, not the ordinary tests. And sudden shocks will come.

To withstand them, I give to axles and driving parts 50 per cent over-capacity. I have made them all ample for a 45-horsepower car.

To prove them out, I ran one of these cars for 10,000 miles, at top speed on rough roads. I met at its worst every possible road shock, and not one important part gave out.

I use 14-inch brake drums. I use 2-inch, 7-leaf springs. I use costly steels—chrome nickel, vanadium, manganese—all to ward off an overtax. I place cost below safety in this Reo the Fifth.

No Troubles

That isn't quite true. All machines have their little troubles. But I've gone to the limit to save trouble with this car.

Each engine is tested 20 hours on the blocks, and 28 hours in the chassis. There are five long-continued tests.

My carburetor is doubly heated—with hot air and hot water—to save the troubles with low-grade gasoline.

I use a $75 magneto to save ignition troubles. I use a centrifugal pump, instead of a syphon, to insure the water circulation. That costs about $10 extra.

Cars are built slowly and carefully, parts ground over and over. I limit my output to 50 cars daily, so nothing shall be slighted.

No Skimping

To make the car show my infinite pains, I give equal care to the finish.

The body has 17 coats. The luxurious upholstering is of genuine leather, filled with the best curled hair.

There are three electric lights, and the dashboard lights are flush. And the whole car, even under the hood is fully nickel-trimmed.

Center Control

Our center control is exclusive to this car. All the gear shifting is done by one small handle, completely out of the way. It is done by moving this handle only three inches in each of four directions.

Both brakes are operated by foot pedals. So no levers at all clog the way of the driver. And this permits of the left side drive.

No other center control will please a man who once discovers this.

Add $200 to My Cost

These extremes, I figure, add $200 to the necessary cost of this car.

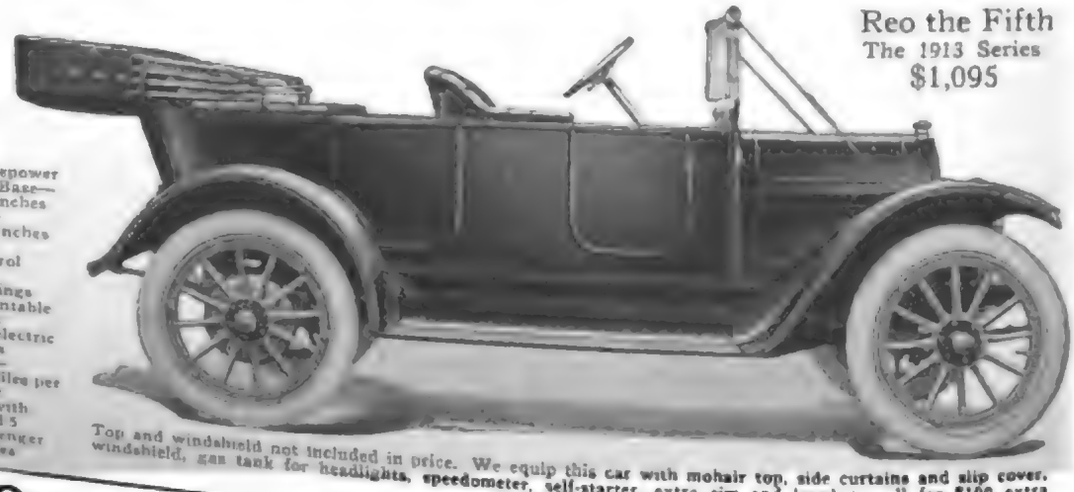
They cut down our profits. They force us to factory efficiency. They compel us to build every part ourselves. And, to minimize cost, we build only one chassis.

But these things save users from three to ten times what it costs me to give them to you.

They insure to you safety, economy, comfort. They insure to me that reputation I have spent 26 years in acquiring.

I find that car users, more and more, are coming to look for this class of car. Our output is always much oversold. And this year, with 60,000 excellent cars to my credit, the demand will be greater than ever.

A thousand dealers are now ready to show this new model of Reo the Fifth. Our 1913 catalog is also ready. Write us for it now.



Reo the Fifth
The 1913 Series
$1,095

30-35 Horsepower
Wheel Base—112 Inches
Tires—34 x 4 Inches
Center Control
Roller Bearings
Demountable Rims
Three electric lights
Speed—45 Miles per Hour
Made with 2 and 5 Passenger Bodies

Top and windshield not included in price. We equip this car with mohair top, side curtains and slip cover, windshield, gas tank for headlights, speedometer, self-starter, extra rim and brackets—all for $100 extra (list price $170).

R. M. Owen & Co. General Sales Agent for **Reo Motor Car Co., Lansing, Mich.**

Canadian Factory, St. Catharines, Ont.



We Want Dealers to Sell Kushion Kore on the Same Basis and in the Same Way They Sell Tire Chains or Electric Horns or Any Other Automobile Accessory.

THERE'S real merit in Kushion Kore—and there's a real demand for such a product. Consequently Kushion Kore is a profitable accessory for every live dealer to handle—on the same basis and in the same way any other legitimate accessory is handled.

WE ARE NOT TRYING TO ROB YOU BY ANY TERRITORY SELLING DEAL

We want honest, energetic representation for an honest, meritorious product—upon which we both can make an honest profit.

We ask you to buy only the actual goods you sell—goods that we will stand back of and guarantee to the absolute limit. And if we can't satisfy you absolutely as to our responsibility and fairness not only legally but morally as well—if we can't convince you that a year's business relations will be not only profitable but enjoyable and satisfactory in every way—then don't start to do business with us.

As we stated in our announcement we're in business to stay—we can only make good by having you gentlemen satisfied and pleased to co-operate with us. This fact is your best guarantee of our business methods.

In many respects Kushion Kore is superior to air in tires. Blowouts and punctures and attendant delays are avoided. In many instances a car absolutely rides easier on Kushion Kore than upon air. Neither extreme heat or cold will affect Kushion Kore. It will always retain its shape and consistency regardless of temperature, weather or road conditions. We don't know how many casings it will outlast—we've only worn out a few. But we believe that Kushion Kore will last so much longer than you dream it will that you'll be glad to buy new when needed. Kushion Kore is free from glycerine, glue, gelatin or any other solvent in water. It is not poured into the tube. As a matter of fact the tube is dispensed with, as Kushion Kore is placed in the casing of the tire enclosed in a knitted cover in its original form. Kushion Kore is 10 to 20 per cent. lighter than any other filler and unsurpassed in any way.

Are you the live dealer we want to represent us in your city? If you are we can show you how to get a lot of satisfied customers to say nothing of your profits while getting them. Write us today.

AMERICAN KUSHION KORE TIRE COMPANY

65-67 Main Street BUFFALO, N. Y.

We will exhibit at New York, Grand Central Palace, January 20-25, Space 414B; Boston, March 8-15, Space 225.

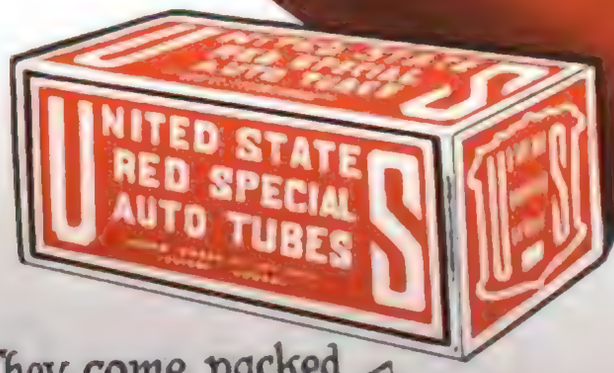
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Here is a Winner in a

No tub
ever sold on th
American market ha
ever approached this on
either in appearance or durabilit

United States

As every dealer well knows, there is an established demand in eve
part of the country for a really first class, extra tough, extra lon
lived red tube. Motorists everywhere—particularly the owners
high-grade cars, are willing to pay an extra price for a spe
red tube if they can be assured of getting extra tube val
for their money. And that is precisely what they get
a UNITED STATES RED SPECIAL TUB
The Red Special is decidedly the highest gra
tube that has ever been sold on the Amer
ican market. It is a tube that is



They come packed in a red carton like this

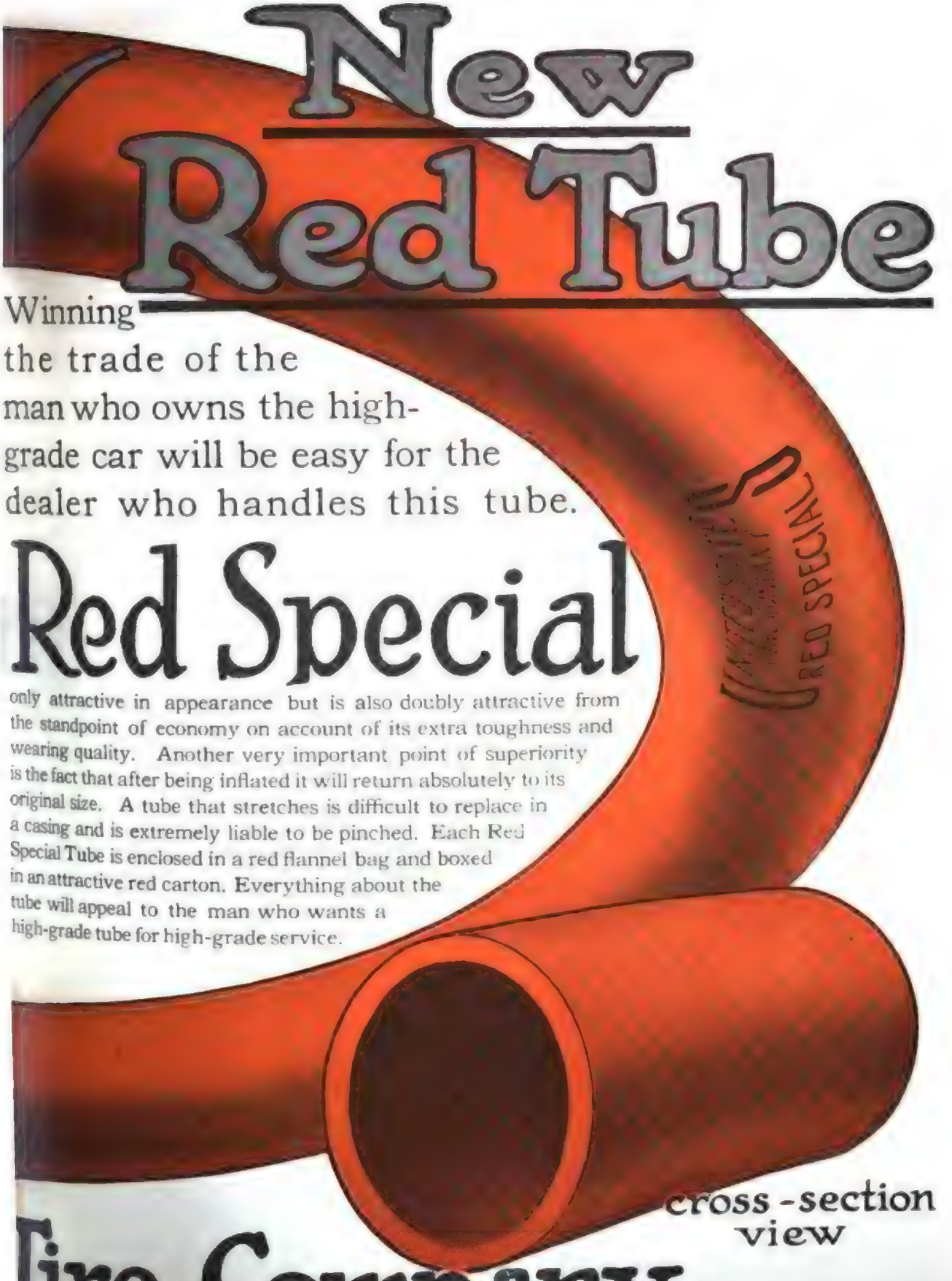
United State

New Red Tube

Winning the trade of the man who owns the high-grade car will be easy for the dealer who handles this tube.

Red Special

only attractive in appearance but is also doubly attractive from the standpoint of economy on account of its extra toughness and wearing quality. Another very important point of superiority is the fact that after being inflated it will return absolutely to its original size. A tube that stretches is difficult to replace in a casing and is extremely liable to be pinched. Each Red Special Tube is enclosed in a red flannel bag and boxed in an attractive red carton. Everything about the tube will appeal to the man who wants a high-grade tube for high-grade service.



cross-section view

Tire Company

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Lesser Forties Can't Compete With This

Hundreds of dealers, on both sides the Atlantic, have conceded the Michigan "40" this year the topmost place at its price.

And millions of dollars have been staked on this fixed conclusion.

You may be sure that motor car buyers won't differ with this verdict.

Buyers of "40's"

This year will demand this up-to-date-ness.

They'll demand four forward speeds.

They'll want big tires, big brakes and springs, wide seats and ample room.

They'll want electric lights, center control, left side drive. A 22-coated, nickel-trimmed body.

They'll want big over-capacity

And we are leading them to expect these things at $1,585—the new Michigan price.

In a Cameron Car

We are giving these things in a car built by Cameron, who has seen 100,000 of his cars make good.

We are giving a body built by John A Campbell, who has designed for kings.

We are giving a car in which, in four years, we have worked out 300 improvements. And 6,000 cars have already proved them out.

We give all this, plus all the features named below, for $1,585.

There are 72 Forties on the market this year. But does any that you know make an offer like this?

Told to Millions

The Michigan features are being told to the millions, in the greatest advertising campaign of the season.

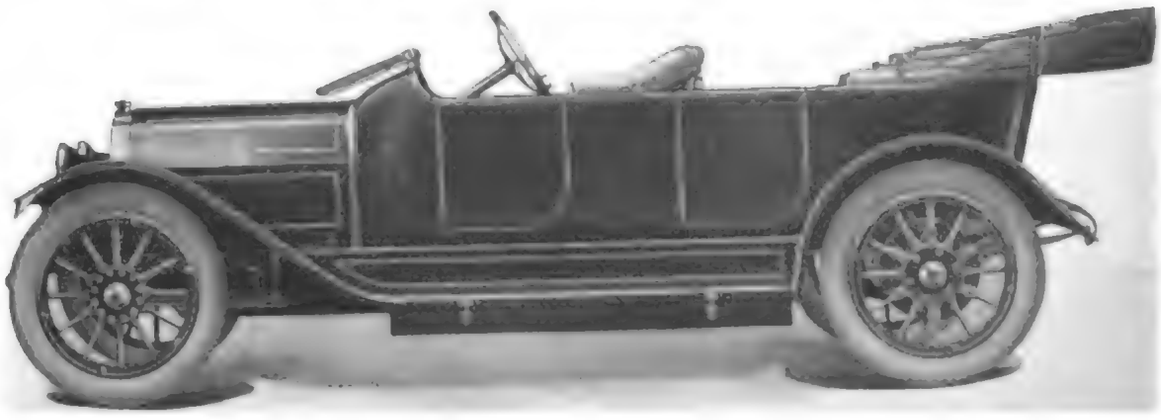
All men will know them. And the "40" buyers this year will look for cars like this. But such a car at such a price will not be found outside Michigan salesrooms.

These facts have been proved to hundreds of experts, in Europe and America. They can be proved to you.

We invite dealers and users to send for our catalog, and the facts which they wish to know.

MICHIGAN MOTOR CAR COMPANY, Kalamazoo, Michigan

Owned by the Owners of the Michigan Buggy Company



SOME OF THE MICHIGAN FEATURES

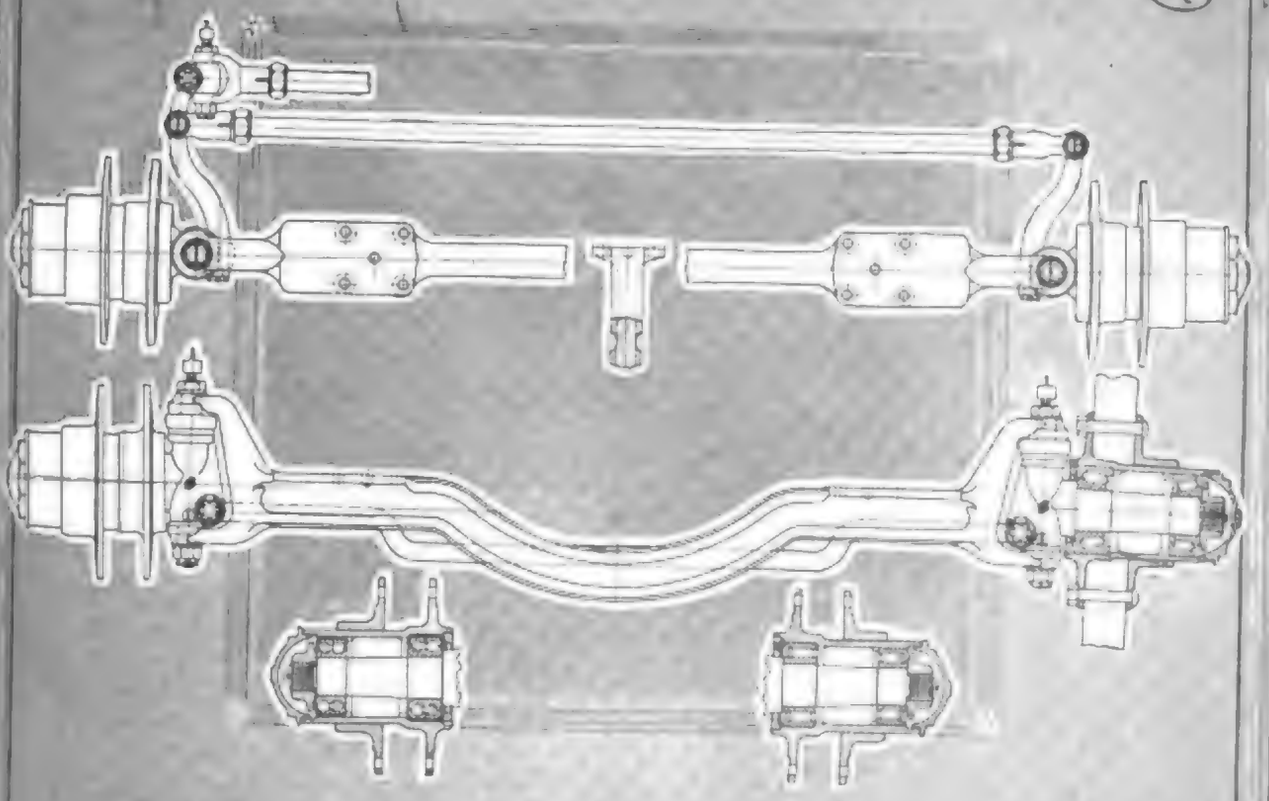
Four-forward-speed transmission
Oversize tires—35 x 4½
Electric lights and dynamo
Center control—left-side drive
Motor- 4¼ x 5¼
Extra effective brakes—16 x 2¼ ins.
Big, comfortable springs
Adjustable steering post
Adjustable pedals
Firestone Q. D. demountable rims—extra rim

14-inch Turkish cushions
Rear cushions 50 inches long
Hand-buffed leather upholstering
Best curled-hair filling
Wheel base, 118 inches
Nickel mountings
Large over-capacity, giving big factors of safety
Pressed steel, full-floating rear axle
Axles sufficient for an 80-horse-power car

Genuine cellular-type radiator
Best mohair top, side curtains and envelope
Windshield built in as part of body
Electric horn
$50 speedometer, 4-inch dial
Special foot rail
Swing robe rail
Rear tire irons
Complete tool equipment
Tool chests under running boards

There is such a difference of opinion about the various types of self-starters that we have not adopted any one type as regular equipment. We prefer to leave this selection to the buyer. We equip with either the gas or a positively efficient electric starter at moderate extra price.

One of the SHELDON FRONT AXLES for Heavy Service



Another member of the famous Sheldon line, even more perfect than its predecessors—this is one of the Sheldon Front Axles for heavy service.

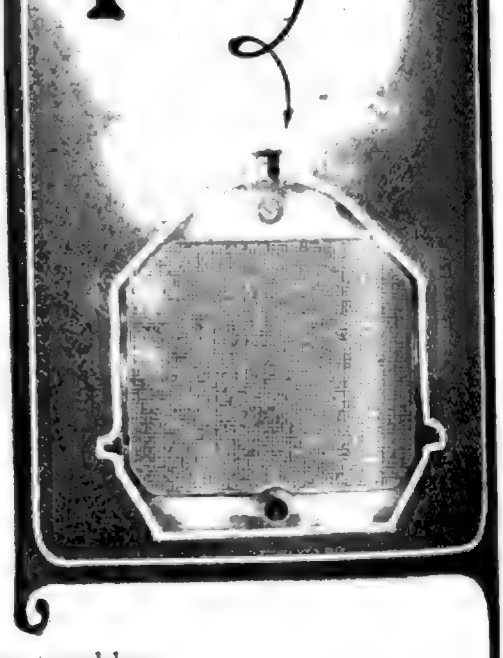
No better forging has ever been turned out in any plant. The spring pads are ample in area and are forged integral with the axle. This axle is not welded in the middle. The steering knuckles are reinforced to ensure greatest strength and safety, and perfect lubrication has been attained by efficient oil cups. We offer this axle to manufacturers with their choice of the following bearing equipment:

New Departure Double Row Annular
Standard Taper Roller
Bower Straight Roller
Rhineland Double Row Annular
Any standard double or single row annular bearing is interchangeable with these axles and hubs.

SHELDON AXLE COMPANY, Wilkes-Barre, Pa.

CHICAGO OFFICE, 68 East 12th St. DETROIT OFFICE, 1215 Woodward Ave.

Skalout will prevent This



For Skalout will guard against an overheated motor and all its attendant troubles.

An overheated motor means serious loss of power and frequently, absolute breakage. If your overheating grows serious enough, it is liable to cause pistons to stick and fracture or cause the connecting rods to break or maybe injure the cylinder itself.

Overheating of the motor always injures the bearings or does some damage that means short life for your motor. Most car owners do not realize that their motors are overheating when they actually are. It is practically impossible to operate the motor without having scale deposited upon the inside of the radiator. This scale not only actually eats out the radiator but it retards the flow of water through the tube and being practically a non-conductor of heat, it renders the cooling system entirely inefficient.

Skalout is a very cheap, certain remedy for all these troubles.

Skalout has been proved by actual tests extending over years.

Skalout is quickly and totally dissolved in warm water and will not pass off in steam.

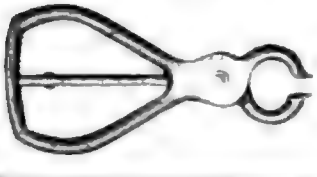
Skalout is not in any way injurious to your radiator, motor or any part of your car. It is absolutely deadly in its removal of scale and yet it is totally harmless in every other respect.

Your customers will appreciate your educating them along these lines.

Skalout is put up in packages to retail for $1.00. There is a good dealer's proposition in this for you.

HOW IS YOUR STOCK OF GILMER REPAIR PLIERS?

The demand for these pliers has been greatly increased by their exhibit at the shows



G. Walker Gilmer, Jr.

52 No. 7th St., Philadelphia, Pa.

GILMER TIRE-REPAIR PLIERS

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MOTOR WORLD

EISEMANN

EISEMANN products have always led because of their general all-round efficiency and durability.

Not because of any spectacular occasional performance, but because of steady performance, of the work for which they are designed, with greatest economy and highest efficiency.

Owing to the fact that a hot fat spark is possible with Eisemann products at an extremely low rate of speed, it is very easy for motors to be started on the magneto if that magneto be an Eisemann.

The Eisemann patented pole pieces are largely responsible for the extreme efficiency of the magneto for they insure the greatest possible volume and intensity of the induced current.

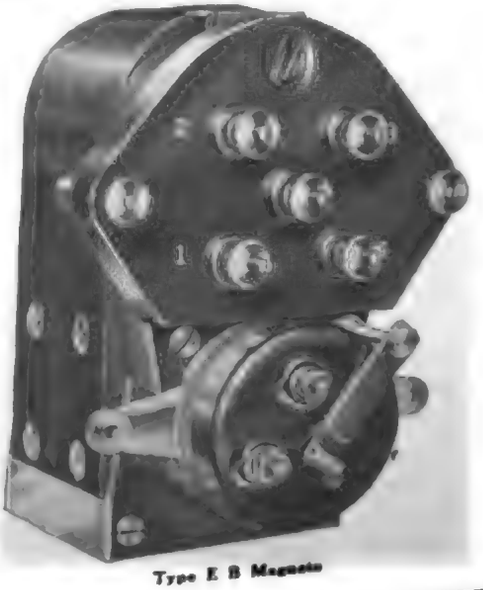
These patented pole pieces also provide for the greatest range of advance and retard. Throughout the entire instrument the most exacting tests are enforced both as to workmanship and quality of material used.

The Eisemann Magneto Co.

General and Sales Office
225-227 West 57th Street, NEW YORK

INDIANAPOLIS, IND.
514 North Capitol Avenue

DETROIT, MICH.
802 Woodward Avenue



Type E B Magneto

THE LONG HORN

$18.00



As Effective As the Lion's Roar

And Below is The JUNIOR LONG HORN $11.00

THE GREATEST AUTOMOBILE HORN VALUE EVER OFFERED

UNBREAKABLE

INSISTENT

LOUD

THE Junior Long Horn retailing for $11.00 is the biggest signal value ever offered the car owning public.

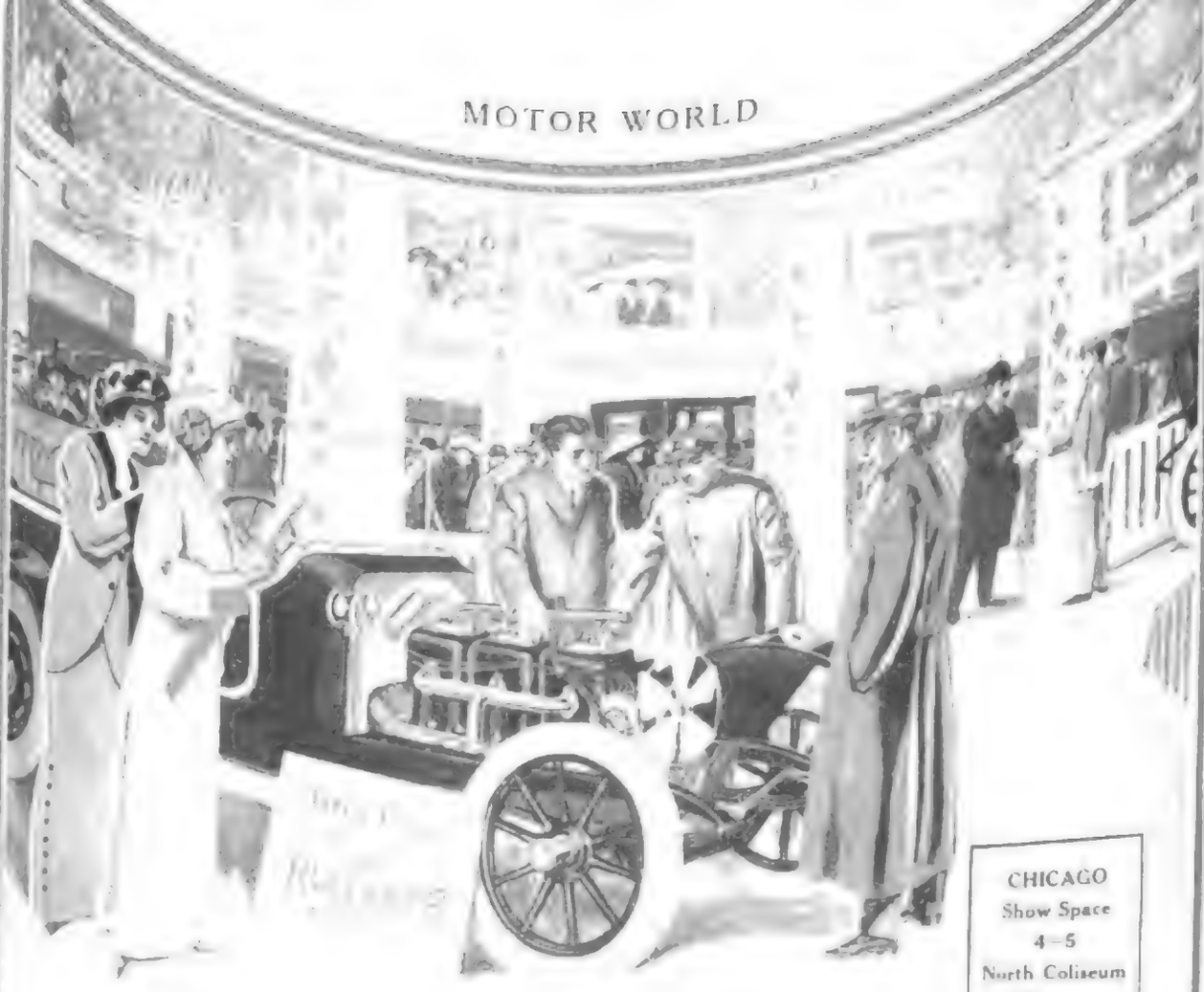
It is just a smaller edition of the well known regular Long Horn, shown at the top of this page, differing in size only and embodying all of the well known mechanical features of the larger type — same materials — same care in construction.

You, Mr. Dealer, can assure your prospective customer that the first cost of a Long Horn of any type, is the last cost, for this signal is mechanically operated on a high

The addition of the Junior Long Horn makes this the most complete line of signals manufactured, ranging from the Junior down to the smaller motorcycle type.

Dealers, investigate our proposition. Let us show you how immediately profitable the Long Horn line can be made to you and let us demonstrate through you to the trade its powerful, characteristic warning sound.

The G. Piel Company



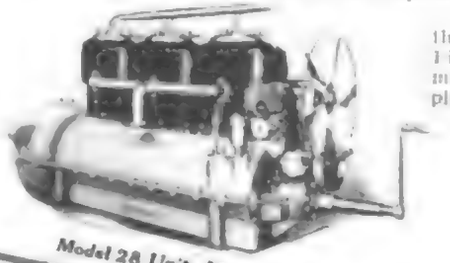
CHICAGO
Show Space
4–5
North Coliseum
Gallery

The Argument that Makes the Sale

THE consideration that determines which car your customer will ultimately select is no longer the superficial appearance of the cars he views. Showy bodies have sold many cars in the past but the cars that find readiest sale today are those which give in largest measure the assurance of motor satisfaction.

THE RUTENBER MOTOR

under the hood of any car, commercial or pleasure, is a guarantee of automobile efficiency. It has demonstrated by years of consistent performance that it will outlive the staunchest of bodies. It has a record unsurpassed for endurance, silent, uncomplaining service and economy of upkeep. It has made motor history and has built the reputation of many a car.



Model 28 Unit, Magneto Side.

The Rutenber Motor will be found in more than fifty of the leading cars during the coming year. Trucks, Ambulances, Fire Engines, Doctors' Cars, Touring Cars and all types of motor driven vehicles requiring the assurance of dependability place their reliance on Rutenber Motors.

Visit our exhibit, North Balcony (Coliseum) at the Automobile Show and talk with the representative of those manufacturers whose cars are Rutenber equipped.

Write for the Rutenber Book.

RUTENBER MOTOR COMPANY,
MARION INDIANA

Warner AUTO-METER



The WARNER AUTO-METER
(Magnetic Type)

Is the *"Dominant Speedometer"* with both the makers and the owners of high priced American motor cars. Nearly all of the makers of high priced automobiles are now installing the Warner as "regular equipment" on their cars. In their catalogs and in their newspaper, periodical and magazine advertising you will find the name "Warner" displayed prominently in bold type. They want that name to catch the eye of the prospective car buyer. Makers of the highest priced cars specify the Warner in their advertising and install it on their product because they know that the class which purchases their cars—keen, well-posted, fastidious buyers—insist on the highest quality of equipment and will have none other than the Warner Auto-Meter. Owners of high priced cars are proud of the Warner Auto-Meter equipment because it has a reputation for highest excellence and in keeping with their standard of exacting requirement.

SPECIAL

We have arranged to place the splendid facilities of our Beloit factory at the disposal of automobile engineers for the purpose of designing new models of speedometers, with special installations and driving equipment adapted to meet the individual requirements of each special make of motor car.

For sale by leading dealers all over the world and at our branches listed below. The prices are never changed — never cut. They never vary. You pay the same price in one state as you would in another. Priced from $50 to $145, according to size and style.

The Warner instrument is *made like a fine watch.* It is a thoroughly jeweled instrument. The jewels used are *select first quality Sapphires,* accurate to 1-2000th of an inch and polished like a diamond. These sapphires insure absolute precision — for life.



Handsome Catalog on Request

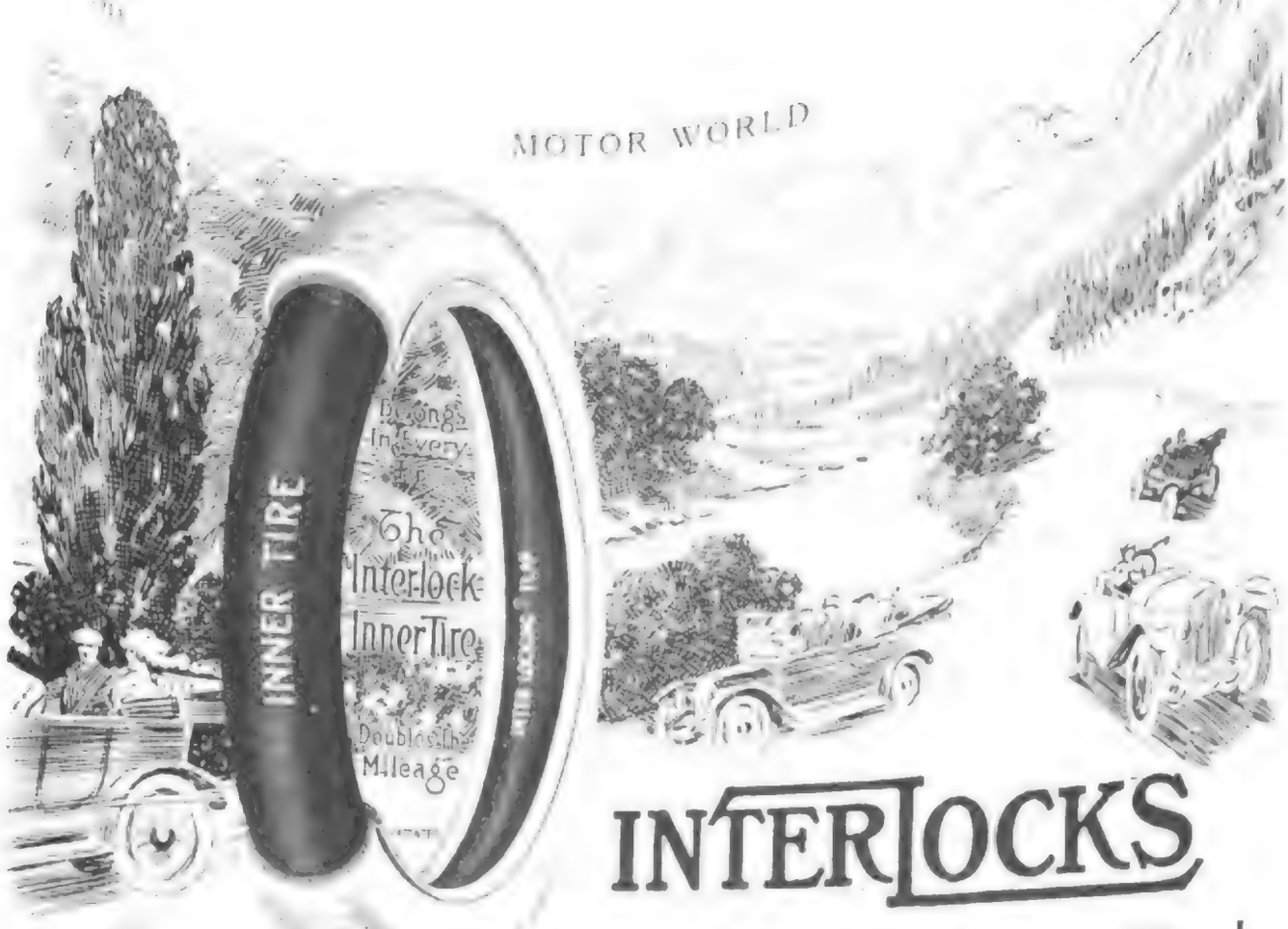
Stewart-Warner Speedometer Corporation

Factories: Chicago and Beloit

General Offices: 1928 Diversey Blvd., Chicago

New York Los Angeles Chicago Minneapolis Kansas City San Francisco
Detroit Philadelphia Indianapolis Cleveland Boston St. Louis Atlanta Buffalo
Cincinnati Denver Pittsburgh Portland Seattle Toronto London Paris

Model K2
Price $75



INTERLOCKS

Prevent Blow-Outs, Punctures and

Double Your Tire Mileage

If you really believed this you would order a set of Interlocks for your car at once. We can prove our statements if you will give us the opportunity. Thousands of car owners are using Interlock Inner Tires with the most satisfactory results. A set of Interlocks will carry most any car one or two seasons (according to use) without tire trouble.

What Interlocks Are

[illegible] tires (not inner tubes) quickly and easily placed between the outer casing and the inner tube. They strengthen the casing and protect the inner tube from punctures. The patented Interlock Flap-lock the Interlock securely, making it an integral part of the whole tire that flexes perfectly and cannot chafe, creep or bunch. Interlock Inner tires will hold even if the outer casing is broken, and can be used in old or new tires. They double the mileage of new tires and add 1,000 to 5,000 extra miles to old ones. Interlocks have a fine gray rubber finish, are smooth on the side and inside and have no troublesome ends, joints or [illegible] to cement. Interlocks do not affect the resilience of your tires, are easy to insert and can easily be removed from one tire and placed in another.

Proved best by Road Tests

[illegible] Interlocks stood the test of hard fast road work under the critical observation of tire experts, without tire trouble. These and other hard public tests have proved the efficiency of Interlock Inner Tires beyond question.

90% of All Tires are Scrapped Before the Rubber Tread is Half Worn Out

because the fabric is not strong enough to resist hard road work, [illegible] rim cuts, etc. The liberal excess fabric strength of tires equipped with Interlocks prevents blow outs, punctures, etc., gives extreme long mileage, safety, and that freedom from tire trouble which every car owner desires.

Write for Our Booklet Send us your address and let us mail you our booklets, data and testimonials of users which are very convincing. Interlocks are sold by the best dealers everywhere. Ask your dealer about them.

To Dealers and Agents Any dealer can [illegible] a large business by telling our customers about Interlocks. We [illegible] proposition. Write for booklet and our dealers' proposition.

See our Exhibits at New York, Chicago and Boston Shows

DOUBLE FABRIC TIRE CO.
600 9th St., Auburn, Ind.

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The Atwater Kent Ignition System

has been silently advertised from coast to coast by the best advertisement any product can have—the personal endorsement of over 100,000 satisfied motorists.

During the period of the magneto craze, we could have taken advantage of this fad and manufactured magnetos. Due to our facilities and prestige, we could undoubtedly have produced and sold large quantities of them. We knew, however, that the Atwater Kent System was fundamentally correct in principle and that it was better than any other ignition device. This opinion was also shared by thousands of our friends who discarded the magnetos on their new cars and installed the Atwater Kent, claiming they got much better results with much less trouble.

You can't equip your car with a more reliable ignition system than the Atwater Kent—no matter what amount of money you are willing or expect to pay for it. Why then take chances by investing in other equipment when by installing the Atwater Kent System you close every avenue to future regret?

Just a few of the many good features of the Atwater Kent System and its advantages over the magneto:

The spark is of constant heat quality irrespective of the speed of the engine, thereby enabling the engine to be run at a very much lower speed if desired.

The simplicity and accessibility of the different parts of the Uni-Sparker are much greater than in the case of the magneto.

The adjustment of the platinum contacts does not affect the timing of the spark.

Easy adjustment to lengthen or shorten the spark, thereby insuring the maximum economy of battery current.

Low maintenance cost and repair expense. Will start engine on spark. Duplicate ignition system not necessary. Light weight. No magnets to become demagnetized. Unlimited range of spark advance or retard. Low initial cost.

In connection with the standard Type F System, we are furnishing a new model—Silent Type K with automatic spark advance and insulated primary circuit, especially designed for use in connection with lighting and starting equipment.

PRICES OF THE TYPE F SYSTEM

	Standard Coil	Kick Switch Coil
1-cylinder	$17.00	
2-cylinder opposed	18.00	
2-cylinder distributor type	22.00	$24.00
3-cylinder distributor type	25.00	27.00
4-cylinder distributor type	25.00	27.00
6-cylinder distributor type	27.00	29.00

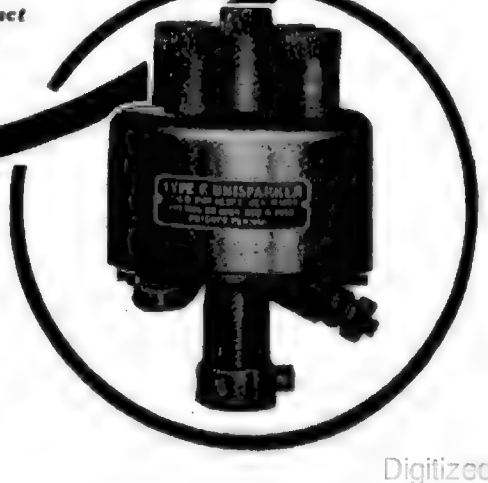
PRICES OF THE TYPE K SYSTEM

	Standard Coil	Kick Switch Coil
2-cylinder	$32.00	$35.00
3-cylinder	35.00	38.00
4-cylinder	35.00	38.00
6-cylinder	37.00	40.00

If you have an unsatisfactory magneto, or if your engine has no timer shaft, you can use the Atwater Kent System by means of a special "magneto gear mounting," the cost of which is $5.00 in addition to the above prices.

Possibly all that car of yours needs to give perfect service is an Atwater Kent Ignition System. Our booklet, " B ," is as interesting as it's free—yours for the asking.

1508

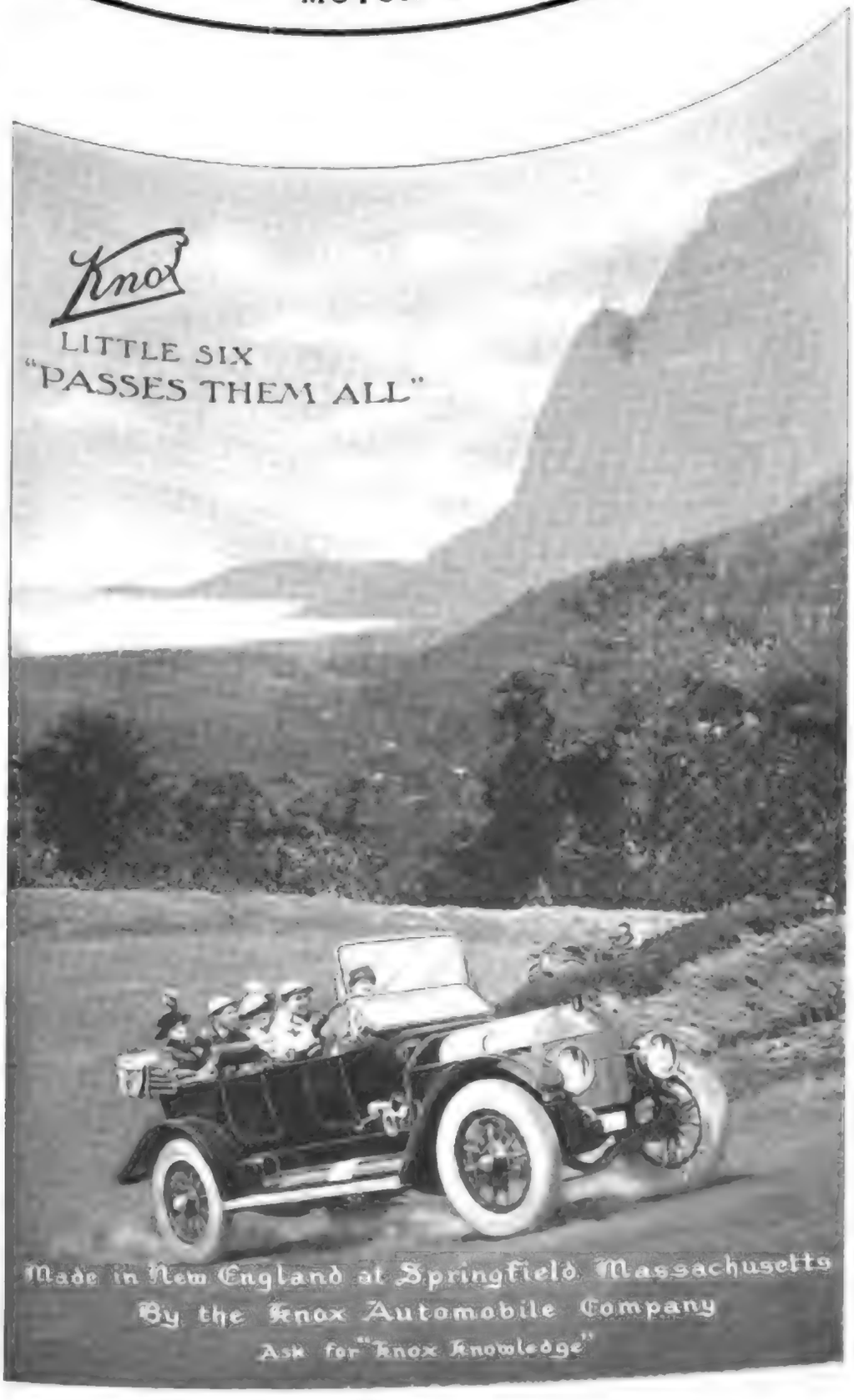


See our Exhibits
Space 140 Madison Square New York
Space 8, Coliseum, Chicago

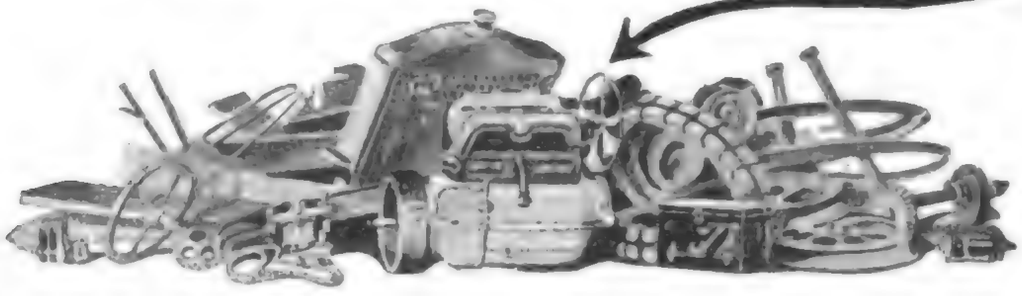
ATWATER KENT MFG. WORKS

4938 Stenton Avenue, Philadelphia

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Knox
LITTLE SIX
"PASSES THEM ALL"
Made in New England at Springfield Massachusetts
By the Knox Automobile Company
Ask for "Knox Knowledge"

Unscramble Your Truck
and what have you got but this?



Mr. Careful Buyer—select your truck the way the sharp trader bought his horse in those bygone days of Horse Trading—in the "knocked-down" fashion—*a combination* of so much sound legs+healthy teeth+sound stomach+unimpaired wind+style, etc.

Buy your Truck as an "assembly of accessories"—a reliable chassis and springs+an efficient motor+a flexible carburetor+a dependable magneto+a pleasing appearance, etc.

And remember that as a "horse is no stronger than his stomach" so A ***TRUCK IS NO BETTER THAN ITS MOTOR.*** *(There's only one moral—Get a* ***BUDA****!)*

Many a Truck is being sold today because the ***Salesman*** appreciates the *Selling Power* and the ***Buyer*** appreciates the *Service Value* of having a

BUDA MOTOR

Beneath the Hood

That prominent manufacturers look at the Buda (with its special oiling device, and exclusive "get-at-ableness") not as *a part of the Truck to Sell* but *The Part that helps to Sell the Truck,* is evident by the following partial list of manufacturers to whom we have sold motors.

Pleasure Cars:

Hudson Motor Car Co.
Michigan Motor Car Co.
Henderson Motor Car Co.
Lenox Motor Car Co.
Schacht Motor Car Co.
Spaulding Mfg. Co.
Croxton Motor Co.
Nova Scotia Carriage and Motor Car Co.
Miller Motor Car Co.
and others

Trucks:

Service Motor Car Co.
Bowling Green Motor Car Co.
Durant-Dort Carriage Co.
Hewitt Ludlow Auto Co.
Tiffin Wagon Co.
Brantford Motor Truck Co.
W. Landshaft & Sons
Harvey Motor Truck Co.
Hurlburt Motor Truck Co.
Schacht Motor Car Co.
Chicago Pneumatic Tool Co.
Lord Baltimore Motor Car Co.
U. S. Government and others.

The Buda "Little Six"

will be ready for delivery by April first and is a product worthy of the Company which was the Pioneer of the "Cast-in-Block" method in U. S.

SHOW NOTICE:

We have spaces at all three of the 13th Annual Automobile Shows as follows:
Grand Central Palace, New York, January 11th to January 25th. Space No. 304, located in the Balcony.
Madison Square Garden, New York, January 11th to January 25th. Space No. 326, located in the Concert Hall.
Coliseum, Chicago, February 1st to February 15th. Spaces Nos. 102, 103, 104, located in Coliseum Annex, 2nd floor.

1913 Specifications
for Hyduty Commercial Motors:

Model "M" Motor, 3¾ x 4½
Model "Q" Motor, 3¾ x 5½

Long Stroke, Enclosed Valves, Noiseless Timing Gears, Self-contained Oiling System. Extra large Valves and Bearings. Ample water jacket.

Send for Special Bulletin to

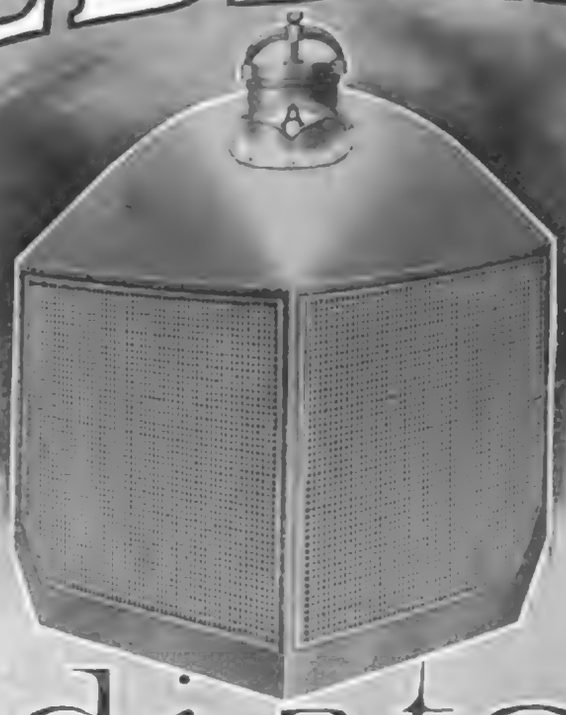
BRANDENBURG & COMPANY

1108 So. Michigan Ave. Chicago
57th and Broadway New York City
Ford Building Detroit

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FEDDERS

Square Tube



Radiators

Water All Around

Repaired At Home

The water channels in Fedders Square Tube Radiators are vertical and horizontal, open on all four sides, guaranteed to give maximum cooling surface.

This form of construction is right and logical—a fact admitted and acted upon by engineers of many of America's best known cars—and in these days the wise manufacturer takes no chances of endangering the popularity of his car by gambling on parts of problematical value—more especially radiators.

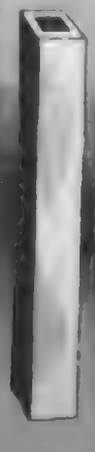
Dealers who sell cars equipped with Fedders Radiators can repair broken tubes with a pair of tinner's irons. No expensive delays in returning to the factory.

Highest cooling efficiency, long life, easy repairs—this is the whole story of Fedders supremacy.

Note that while we specialize on Square Tube Radiators, we are also equipped to produce radiators of any type and in any quantity over specifications furnished. Get in touch with our engineering department.

FEDDERS MANUFACTURING CO.
Buffalo, New York





Highest Efficiency-Longest Life

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The Triplex Ford Engine Starter



How Are Your Ford Cars Started?

DO YOUR OWNERS STILL STRADDLE THE BUMPER AND CHURN THE CRANK?

You will give them this message if you appreciate the unequaled advantages of starting the Ford car with the TRIPLEX ENGINE STARTER.

The TRIPLEX FORD ENGINE STARTER is a mechanical starter, which, of all types—compressed air, acetylene gas, electric and spring—is the only one on the market which at all times proves absolutely RELIABLE. In no respect is it a "Hit-or-Miss" proposition—working one minute and short circuiting or blowing out a cylinder head the next. It gives 100 per cent. uninterrupted service from the time it is attached. It comprises so few parts and is so simple and direct in application that it cannot get out of order, and it is as safe and durable as it is simple and effective.

You do not have to leave your seat to start the Ford Motor, WHEN EQUIPPED WITH THE TRIPLEX STARTER.

All that is necessary is to pull the lever. Will absolutely start the Ford 1,000 times out of 1,000.

Can be easily attached in one hour's time. Absolutely no holes to drill or mechanical work necessary to install same. Absolutely guaranteed to outlast the motor.



DEALERS: It doesn't require SALESMANSHIP to sell an ARTICLE for which every FORD OWNER is clamoring. Bring the TRIPLEX FORD ENGINE STARTER AND THE FORD OWNER together and a sale results.

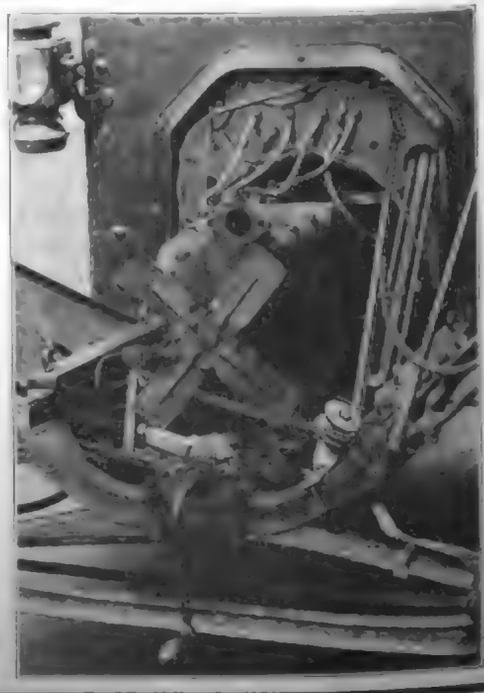
Price $11.50

Your Commissions Are Liberal

BREMER-WILSON MANUFACTURING CO.

1256 Michigan Ave., Chicago, Ills.

Western Representative,
AUSTERMELL & HANSON,
560 Phelan Bldg.,
San Francisco, Cal.





The Triplex GUARANTEE

The Triplex finishes the work the carburetor leaves half done.
The Triplex makes imperfect carburetion a mechanical impossibility.

Sixty Day Trial Proposition.

The Triplex is guaranteed to decrease fuel consumption 25%, increase power, prevent carbonization, prevent Back Firing, effect easy starting.

The Triplex will increase mileage, promote flexibility.

The Triplex will equalize the most uneven mixture that leaves the carburetor—make it uniform throughout.

The Triplex utilizes every drop of gasoline to its full capacity, making a saving of over 25% per gallon. It gives you five gallons of fuel at a cost of four. It makes high-grade gasoline out of low.

INSURE YOUR CAR Against Fire By Using a Triplex.

A back fire is impossible with a TRIPLEX, due to the fact that any flame is cut off before it reaches the raw fuel in the carburetor. Fire cannot pass through a TRIPLEX. The principle is the same as the non-explosive feature of the miner's gauze lamp.

The Triplex makes starting easier regardless of temperature or atmospheric conditions, and stops suction of live gasoline when the motor is cold.

The Triplex increases power proportionately. The full cylinder charge is ignited every time—the maximum power delivered at the point of highest efficiency. Because there is no fuel waste, there is no power waste. A TRIPLEX is a double economy—it INCREASES power at the same time it DECREASES fuel consumption.

The Triplex can be readily attached by anyone in one-half hour's time.

The Triplex is sold with the understanding that if it does not do as we claim we will gladly refund your money at the end of sixty days.

90 %
OF THE AUTOMOBILES DESTROYED BY FIRE ARE CAUSED BY A BACK FIRE IGNITING THE RAW GASOLINE IN THE CARBURETOR

PRICES

1	in., $3.50	1¾	in., $5.00
1¼	in., 4.00	2	in., 5.50
1½	in., 4.50	2½	in., 6.00

In ordering Give MODEL, H. P., and Make of Car.

To be had at all dealers, or direct on receipt of price.

DEALERS—Here is one of the fastest selling devices on the market. Every motorist has got to have one. **Big sales spell big profit. Write or Wire Today for our Sales Proposition.**



WRITE DEPT. 10.

BREMER-WILSON MANUFACTURING CO.
1256 MICHIGAN BLVD. CHICAGO, ILL.

WESTERN REPRESENTATIVES
AUSTERMELL AND HANSON
860 PHELAN BLDG. SAN FRANCISCO, CAL.

Triplex

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The Gas Tank Patent Has Expired

The U. S. Circuit Court of Appeals, for the 7th Circuit, has just decided that the patent of the Commercial Acetylene Company has expired.

This leaves anyone free to manufacture and sell gas tanks of their own make.

But it does not give anyone permission to refill OUR Tanks. We have easily stopped this in many parts of the country, by order of the U. S. Courts. We shall now proceed to stop this practice everywhere.

Other companies are now free to get all the business they can legitimately on tanks of their own make, and free to re-fill their own tanks.

As to the future, it is evident that the whole gas tank industry settles down to the plain proposition of service.

You already know what Prest-O-Lite Service is.

Watch! Wait! Listen!

The Prest-O-Lite Co.

Indianapolis, Indiana

Canadian Factory and Branch Office, Merritton, Ont.

SERVICE STATIONS IN THESE CITIES: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Memphis, Tenn., Milwaukee, Minneapolis, New Orleans, New York, Omaha, Philadelphia, Pittsburgh, Portland, Ore., Providence, St. Louis, St. Paul, Minn., San Antonio, San Francisco, Seattle, Syracuse.

SERVICE STATIONS IN CANADA: Merritton, Ontario; Toronto, Ontario; Winnipeg, Manitoba.

Exchange Agencies Everywhere

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CHICAGO ELECTRIC



The Chicago Electric

This luxurious equipage, without a peer in point of engineering excellence and classic beauty, answers a nation-wide demand.

¶ Here is an electric pleasure vehicle that commands the attention of every dealer in the United States, because of its superlative and distinctive qualities. It answers absolutely a nation-wide demand for an electric of the highest constructional efficiency and incomparable grace of body design.

¶ This Electric is the crowning achievement in the life of Frederick J. Newman, overshadowing all his past triumphs in electric car building.

¶ Behind this car stands an organization of noted Electric Car experts, each one of whom has attained notable success in this industry. These men have given their best thought and efforts to the Chicago Electric because they fully perceived the enormous possibilities of this perfect pleasure car. These same opportunities are open to the dealer who realizes the limitless field for an Electric of such pre-eminence.

¶ The Chicago Electric 1913 Models will be exhibited at the Chicago Automobile Show only. Our factory and sales organization are located here and we are thus enabled to do complete justice to our display.

The new cars are now ready for delivery.
We respectfully invite correspondence.

Chicago Electric Motor Car Co.

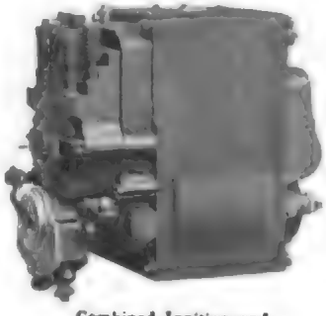
3606 South Morgan Street
Chicago

Westinghouse
Electric Starting, Lighting and Ignition

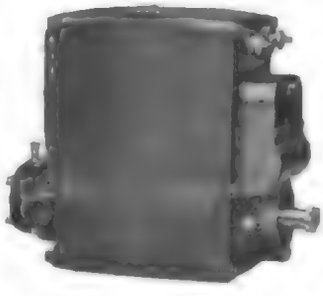
THE electrical starting, lighting and ignition systems on a number of the finest and best known cars this year will be Westinghouse built.

To be able to supply cars with electrical equipment that is backed by the experience of a long-established electrical manufacturer with large facilities like the Westinghouse Company has been the desire of every leading automobile manufacturer, and Westinghouse equipment will be one of the strong talking points of the new models.

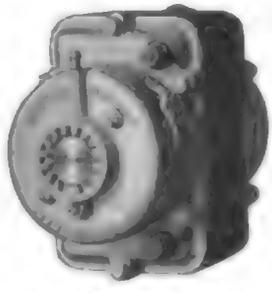
Take a hint from the judgment of the manufacturers of these cars and see that the machine you purchase has Westinghouse equipment.



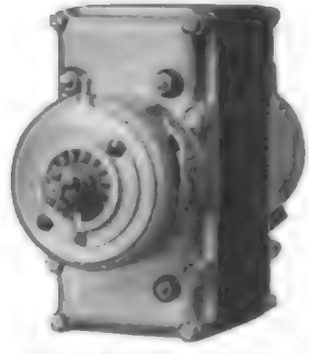
Combined Ignition and Lighting Generator



Lighting Generator



Starting Motor for High-power Cars



Combined Starting and Lighting Unit for High-power Cars

The equipments include: starting motors; lighting generators; combined lighting and ignition generators; and combined lighting and starting units; all standardized for different types of cars. All equipments are 6-volt systems.

Lighting and Charging

Westinghouse automobile generators automatically charge the battery without the use of any relays or solenoid-operated regulators. There are no adjustments to be made. The battery is at no time charged at an excessive rate.

The generator is slow speed, eliminating noise and wear.

Ignition

A high-power single-unit spark coil, acting in conjunction with timing and distributing parts on the generator, furnishes high voltage for the spark. The battery operating alone or with the generator supplies continuous power. The interrupter gives automatic spark advance. The spark is uniform, regardless of speed.

Starting

Minimum weight of motor and minimum discharge of the battery are features of the Westinghouse starting motors, permitting the use of a smaller charging generator.

A Westinghouse starting motor therefore means less weight to carry and fewer battery renewals.

Every Westinghouse Equipment is backed by the Westinghouse Guarantee

Westinghouse Electric & Manufacturing Company
EAST PITTSBURGH, PA.

KLINE KAR

THE WAR IS ON CHOOSE YOUR WEAPON

FORTY $1,985 Mr. Dealer, will you enter the great automobile conflict that is sure to be waged throughout the whole country this year armored to meet and successfully repel all the thrusts and attacks of competitive concerns or are you satisfied to slide along the lines of least resistance and be a failure? Here is the secret of success—this wonder car, four cylinder, forty horsepower Kline, with electric starter and dynamo electric light, and four-speed transmission, at a price you would have named had you been the only one concerned.

The Boom of the Second Gun

FIFTY $2,585 A light six cylinder, fifty horsepower car, designed to meet and successfully negotiate all the requirements of six-cylinder construction. A car that is bound to leap into the good graces of the automobile buying public and remain there—a proven success. This car, electrically started and dynamo electrically lighted, with the economical four-speed transmission, now a feature of every machine in the Kline line, places Kline Kar dealers in the running no matter how strong the odds and allows them to emerge with colors flying.

Reinforced by the Thirty

THIRTY $1,750 You can flank your other movements and have a car of nominal horsepower—30 at 1200 revolutions—and with four cylinders excelled by none on the market at the price, with the past efficient Ever-Ready automatic starter as standard equipment. This car lacks in none of the details that have entered into Kline Kar success in the past and fortifies you and gives you prestige in the eyes of your prospect.

The Sixty Makes Victory Sure

The Kline Kar Master, Model 6-60, at $3500—a final word in motor car construction—seven-passenger capacity, big, roomy and comfortable; silent, speedy and reliable and excelled by none on the market in point of luxuriousness and beauty of design, completes a line that you cannot possibly pass without thorough investigation.

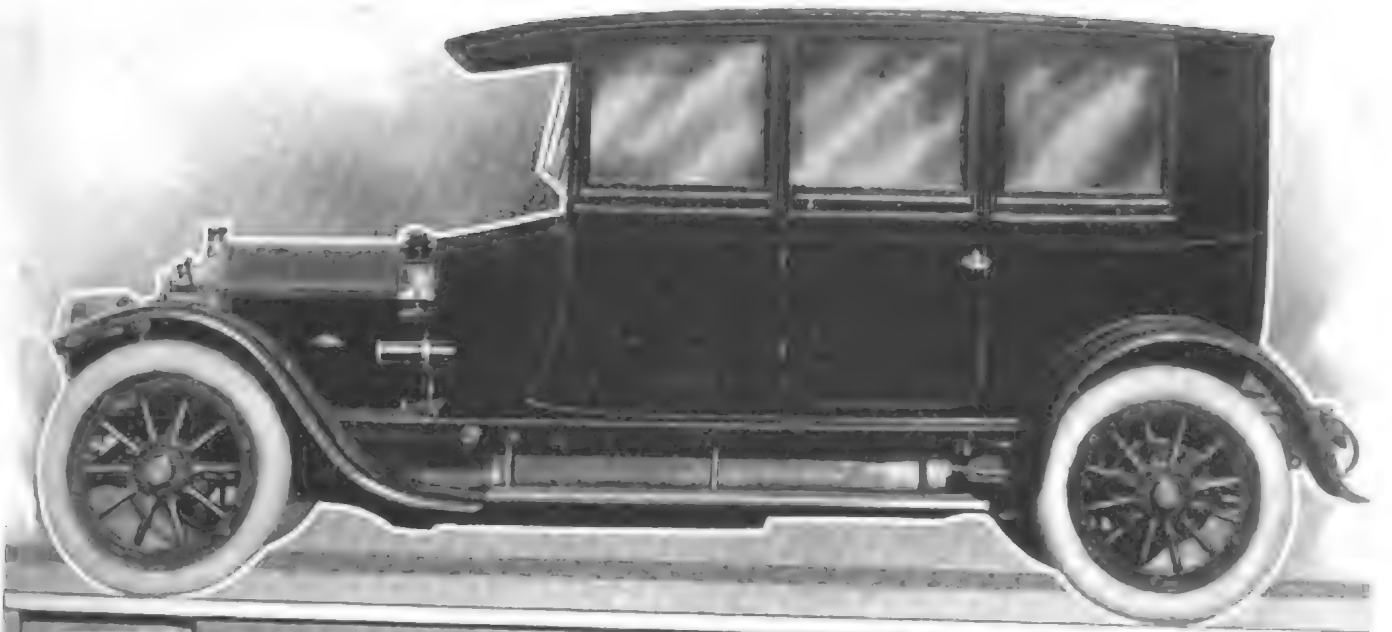
SEE THEM AT NEW YORK AND CHICAGO SHOWS

Some Desirable Territory Still Open

KLINE MOTOR CAR CORPORATION

Main Office and Factory:
RICHMOND, VIRGINIA

Richmond, Virginia **York, Pennsylvania**



WE WANT MORE DEALERS TO SELL METALLURGIQUE

THE ARISTOCRAT OF EUROPE

The Car of Royalty

For Exclusive American

European Quality

European D

The Metallurgique propaganda is growing faster than we had anticipated—prejudice against the foreign car, just because it is foreign is disappearing, and our dealers are finding out that real European supremacy in matters of design, materials and lines is appreciated—and sought after.

Now, Mr. Dealer, we will be perfectly frank: The Metallurgique is the rich man's car. It is an automobile for the classes—for men of wealth and ability to discern the real difference in cash value between this swagger car of service and the very best American products.

It's just a question of steel versus steel—design versus design and appearance versus appearance. If you want strong, telling arguments on this controversy, write and we will put information into your possession that will help you sell the Metallurgique.

THE METALLURGIQUE CO.

1934 Broadway **NEW YORK**

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THE LARGEST AUTO SUPPLY HOUSE IN AMERICA

Our Name Is Your Guarantee

WHATEVER you buy from the house of CHAS. E. MILLER you may expect the fullest degree of satisfaction in every detail. Quality, quantity, material, workmanship, durability will be just right or we will make it right. Our name is your guarantee.

To buy from a house the size and standing of this one is the safest way to insure complete satisfaction in all your dealings. We handle goods of **standard quality only** and of course stand back of everything we sell.

No matter what you want in the line of automobile accessories or supplies, remember our slogan, "We Either CARRY IT IN STOCK, WILL GET IT—OR IT ISN'T MADE." One of the prize winners in MOTOR'S recent advertising contest selected this as the slogan out of the many shown. His reason was as follows: "This saying is the clearest possible statement of the Miller business policy which I have found to be a fact through several years of satisfactory relations with them."

Our Annual Catalog is the largest, most complete, up-to-date and authoritative dictionary of the auto supply market of any book published. It has come to be recognized as one of the standard reference works of the industry.

The total distribution of one hundred thousand copies of this catalog practically covers the world, at least wherever automobiles are used. Nearly all foreign as well as domestic automobile manufacturers and dealers, the offices of American Consuls, Public Libraries, Universities, Y. M. C. A. Schools, Publishers, Automobile Clubs, Engineers' Offices, Purchasing Departments—in all these places you will find a copy of the Miller catalog on file.

Fifteen branches spread over the United States, located in the principal motoring centers, bring Miller service within the reach of practically every motorist in the United States. Prompt delivery, perfect quality, honest prices—these are the things that distinguish Miller service and explain the marvelous growth of this pioneer establishment since its inception in 1896.

CATALOG MAILED TO ANY ONE ANY PLACE ON REQUEST

Chas. E. Miller

Manufacturer, Jobber, Exporter and Importer

ESTABLISHED 1896

Home Office: 97-99-101-103 Reade Street, New York City

ORDER FROM NEAREST BRANCH, ADDRESS CHAS. E. MILLER

NEW YORK CITY 97-103 Reade St	BROOKLYN, N. Y. 1421 Bedford Avenue	BOSTON, MASS. 202-204 Columbus Ave.	DETROIT, MICH. 227-229 Jefferson Ave.	ATLANTA, GA. 259 Peachtree Street
NEW YORK CITY 924 Eighth Avenue	BUFFALO, N. Y. 824 Main Street	SPRINGFIELD, MASS. Bridge and Dwight Sts.	CLEVELAND, O. 1829 Euclid Avenue	NEW ORLEANS, LA. 601-603 Baronne St
NEW YORK CITY 2782 Broadway	ALBANY, N. Y. 135 Central Avenue	HARTFORD, CONN. 274 Trumbull St.	PHILADELPHIA, PA. 318 North Broad St.	NEWARK, N. J. 274 Halsey Street

Lancia

AMERICA'S FAVORITE EUROPEAN CAR

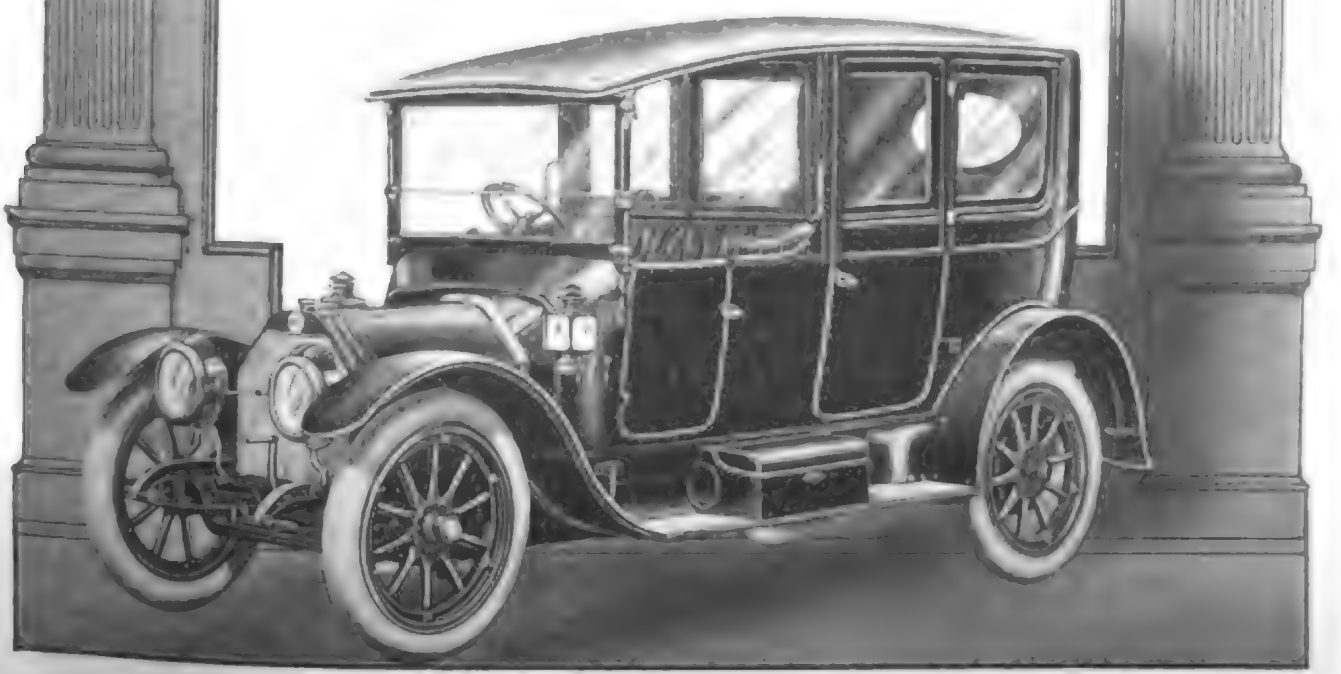
LANCIA DEALERS KNOW

That there is a large and ever increasing buying interest developing in this country for the European car of American price—but it is patent that the average foreign automobile is extravagantly priced on this side.

The Lancia is the car to meet the actual European superiority over American cars of equal power and that added value in strength, flexibility, silence and good appearance with an unusual line will make friends and customers for you. Are Dealers among the elite in your territory.

We will be glad to submit our latest selling arguments that make commercial sense. Write and ask us to prove our assertions.

THE ADAMS-LANCIA CO.
238 West 38th Street New York



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Women Influence the Sale of Your Car

VOGUE

Influences These Women

It is not surprising, therefore, that the leading automobile manufacturers should be using more and more space each year in Vogue to influence women of wealth and social position.

Is your advertising following the trend of the times as shown by the table below?

Volume of Automobile Advertising in the Leading Publications:

	1910	Agate Lines	1911	Agate Lines	1912	Agate Lines
1.	Saturday Evening Post	158,986	Saturday Evening Post	202,945	Saturday Evening Post*	384,200
2.	Collier's	137,109	Collier's	171,722	Collier's*	243,030
3.	Life	111,560	Life	127,954	Life*	160,270
4.	Literary Digest	59,269	Literary Digest	77,635	Literary Digest*	112,055
5.	Outlook	31,087	VOGUE	50,191	VOGUE	71,356
6.	Everybody's	30,008	Country Life	45,518	Country Life	70,280
7.	McClure's	28,780	Everybody's	31,432	Cosmopolitan	49,947
8.	Cosmopolitan	24,355	McClure's	25,565	Everybody's	35,092
9.	American	22,939	Cosmopolitan	24,946	Review of Reviews	33,711
10.	Review of Reviews	22,869	Outlook	23,408	McClure's	25,821
11.	Munsey's	19,832	Review of Reviews	23,129	Outlook*	23,545
12.	Hampton's	18,846	Hampton's	16,823	Munsey's	23,181
13.	Scribner's	16,644	American	15,195	Scribner's	21,679
14.	Success	12,630	Munsey's	13,763	Century	19,075
15.	VOGUE	11,912				

* The first 11 months of 1912 only.

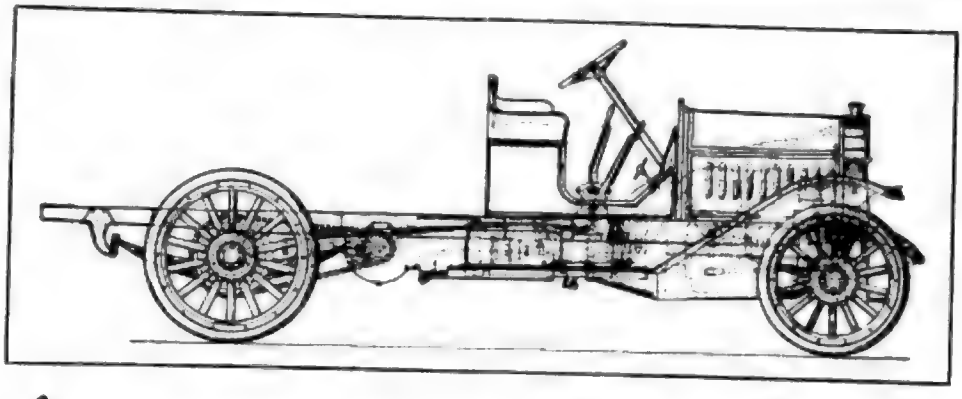
Every time you improve the style and comfort of your cars, you make them just so much more appropriate for the readers of Vogue.

Vogue readers have been schooled to appreciate luxury and convenience. They have the money to pay for it. In the circulation of Vogue we have bottled up the combined buying-power of the wealthiest families in America.

BARRETT ANDREWS
Advertising Manager
443 Fourth Avenue
NEW YORK CITY

STEVEN C. RAWLINS
Western Manager
Corn Exchange Bank Building
CHICAGO, ILLINOIS

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A new record making 2500 lb. Kissel truck

This new 2500 lb. KisselKar Truck is a distinctive innovation in commercial vehicles of this capacity. It is a genuine truck of solid and substantial construction from the ground up—heavy, high grade construction, such as has never before been put into a commercial truck of this capacity. It is the result of truck building experience and a careful correction of every known truck trouble. From the standpoints of design, construction, ability and price, **it has absolutely no competition.**

Motor—36 H.P., 4 cylinders cast in pairs, 4¼ x 5¼.
Unit construction, large, heavy Chrome Vanadium gears and shaft.
Frame of extra heavy pressed steel, the size usually found in 2-ton trucks.
Has foreign design spiral radiator which gives 50% greater radiation than ordinary types.
Radiator is protected by heavy aluminum casing and suspended on springs, greatly minimizing vibration.
Power plant supported at three points by spring suspension to give flexibility and further reduce vibration, and keep working parts in alignment.
Final chain drive and differential lock by which both drive wheels may be locked together on solid axle, preventing one wheel from absorbing power when spinning on ice, in mud or snow.
Speed controller which regulates the speed of the truck and not the motor.
Left hand drive and center control.
Big wheels, 38 x 5 tires, such as are usually used on trucks of double this capacity. This means economy and tire manufacturer's guarantee.
Demountable rims.
Extra large axles.
All levers, rods and joints of extra size.
Metal running footboard.
Two lengths of frames and wheelbase—8 x 5½ body and 10 x 5½ body.

DON'T FAIL TO SEE THIS TRUCK

In every point of design and construction this truck is superior to anything of like capacity ever built. It is the new, big feature of the truck field.

SEE IT AT THE SHOWS

New York—Space 113A, Madison Sq. Garden **Chicago—Section C, Coliseum**

KISSELKAR TRUCKS

1500 lb., 1 ton, 2500 lb., 2, 3, 4, 5 ton Trucks, Delivery Cars, Fire Department Apparatus, Ambulances, etc. Write for Truck Catalog.

Kissel Motor Car Co. Kissel Ave., Hartford, Wis.

BOSTON NEW YORK CHICAGO MILWAUKEE KANSAS CITY
LOS ANGELES MINNEAPOLIS ST. PAUL DALLAS

Philadelphia, Cleveland, Detroit, El Paso, San Antonio, New Orleans, Baltimore, Omaha, Butte, Denver, San Francisco, Seattle, Portland, Duluth, Buffalo, Pittsburgh, Hartford, Conn., New Haven, Albany, Troy, Montreal, Quebec, Toronto, Winnipeg, and 200 other principal points throughout America.

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Again—

The PATHFINDER

at the New York show

received the hearty

commendation and

endorsement from thousands

of visitors

for—

beauty of finish,

individuality,

perfection of mechanical

construction and the

simplicity of the Pathfinder

electric self-starter



The Gray & Davis electric starter as applied to the Pathfinder chassis—
Pressure on a foot-button
starts the engine

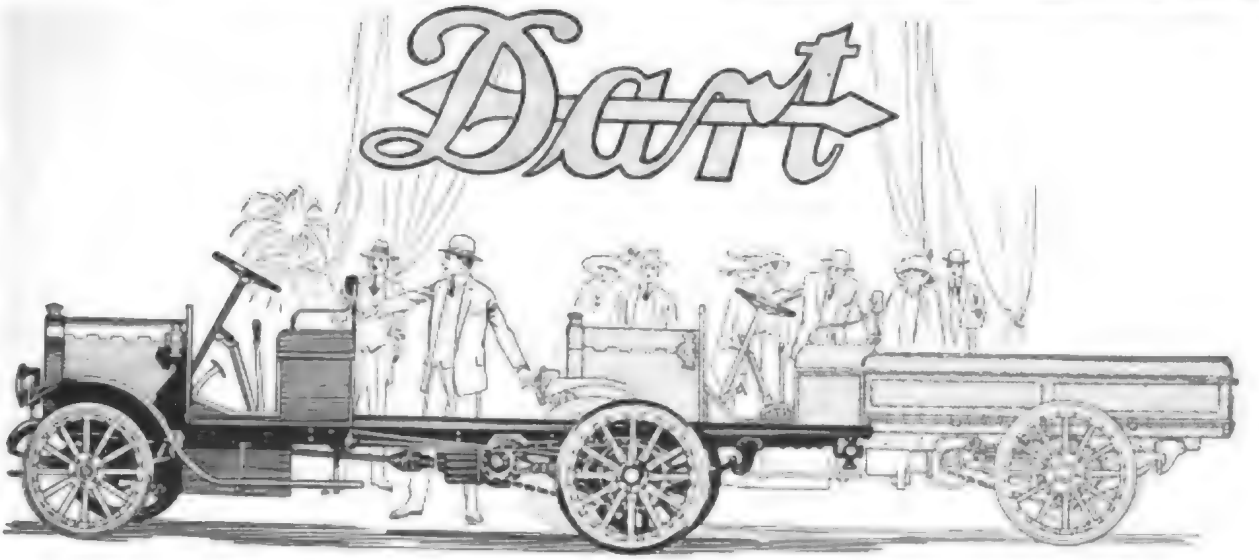
It will pay you to write
for our "101—Reasons"
You have an exclusive feature
in every mechanical part
of the Pathfinder chassis.

write—

THE MOTOR CAR MFG. CO.
designers and builders
Indianapolis

Don't fail to see the Pathfinder at the Chicago show
First Regiment Armory

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See These Dart Trucks
At The Shows

THERE'S a revelation in auto trucks awaiting you at the New York and Chicago Shows. The new 1913 Model Dart Trucks—triumphs of engineering skill and made to sell at exceedingly moderate prices—will be on exhibit for the inspection of truck users and dealers.

The money-making opportunities which these trucks offer to dealers and users are so tremendous as to be positively remarkable. If you intend to visit either of the shows let your attention center on the Dart exhibits and let us explain to you our 1913 proposition.

Prices That Shatter Traditions

We've shattered to atoms the tradition that a substantial, well-built truck with liberal specifications **had to** sell for $3,000 to $5,000. The new 1913 Dart Trucks at $1,100 and $1,800 include more *actual, tangible* value than can be found in any other truck of the same capacity in the entire world. They set a *new standard of value.* They embody all the meritorious points gleaned from twenty years of experience. The liberal specifications will amaze you.

A Remarkable Test

The wonderful performances of Dart Trucks are significant of their exceptional construction. In a recent hill climbing test a Dart truck carried a full load up Giant's Despair Mountain at Wilkes-Barre, Pa.—a grade of 37½%. This performance indicates the efficiency of the Dart—its wonderful durability and power.

Three Models for 1913

The 1913 line of Dart trucks comprises these three classes—each a remarkable value:

Model ED 1000 lb. capacity (2 cyl).....$ 750
Model B 1000 to 2000 lb. capacity (4 cyl)..... 1100
Model C 2000 to 3000 lb. capacity (4 cyl)..... 1775

Steel wheels with Goodyear, hard rubber base tires furnished on Models B and C for $100 per car extra.

Complete specifications and detailed information about our 1913 proposition can be obtained at our exhibits or by writing us at the factory.

Dart Trucks will be Exhibited at the Following Shows:

NEW YORK
Grand Central Palace—Section 42A

CHICAGO
Coliseum Annex—Space Q1

Come and See These Remarkable Trucks or Write Us.

DART MOTOR MANUFACTURING CO., Waterloo, Iowa

(10)

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Quick Sales---Big Profits

For You Mr. Dealer

You know what it means to have a lot of slow selling accessories on your shelves. Then you will be interested in the money-making sales plan back of the MARVEL STEAM VULCANIZER, the easiest and best selling vulcanizer on the market. Many dealers are making big money selling the

Marvel Steam Vulcanizer

The Only Automatic Steam Vulcanizer Made

The Marvel is the only steam vulcanizer that is absolutely automatic in its work. It uses either alcohol of gasoline. Being the lowest priced steam vulcanizer made, it is therefore the best seller.

The Marvel Steam Vulcanizer can't burn or scorch the rubber. Steam heat **cures.** Dry heat **crystallizes** rubber. You know this. Your trade knows this. Vulcanizing that does **not** cure is worse than none.

The Marvel Vulcanizer embodies the same principle as that of the large vulcanizing plants. It's logical, right and saves tires. The Marvel should not be confounded with the ordinary electrical, alcohol or gasoline heated vulcanizers.

If you are interested in making money through quick, easy sales, fill out the coupon attached or write us a letter asking for our sales plan, terms and a sample vulcanizer. We'll send one free, express charges prepaid, so you can try it and see for yourself how easy the Marvel sells.

THE MARVEL AUTOMOBILE SUPPLY CO.,
Cleveland, Ohio.

Gentlemen: Without cost to me, please send me by express, charges prepaid, one Marvel Steam Vulcanizer to try for 30 days. Also send me your dealer's proposition, showing how I can increase my profits on vulcanizers.

Name .....
(Write plainly)

City and State.....

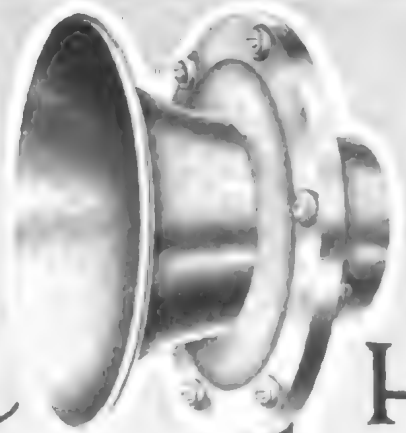
Street .....

The Marvel Automobile Supply Company

716 Bolivar Road, Cleveland, Ohio

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CUBIT



ELECTRIC HORN

$3.00

A Good Horn at a Low Price.
In Black Enamel, very High Gloss.
Weighs Two Pounds and a Half.
Consumes very little current (1½ to 2½ amps.).
Emits high toned Musical Blast.
Has no working parts to get out of order.
Has no VIBRATOR, the diaphragm is the Armature.
Requires no Oil. Runs on SIX VOLTS.
Gets better with age as the "Bulging" of the diaphragm which is detrimental to other horns makes the "CUBIT" more efficient.

NONPAREIL HORN MFG. CO.
Eastern Distributor
73-75 Wooster Street, New York City

Push button and wire that retails for $2.00 packed in separate box, 35 cents extra.

KOSMAK ELECTRICAL COMPANY

JERSEY CITY, N. J.

Office and Factory, 299 Ocean Ave. Factory, 17 Stevens Ave.
Branch Office, Ford Building, Detroit

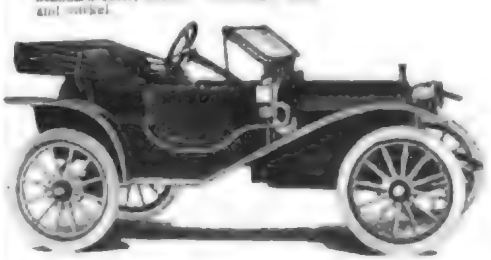
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Hupmobile

Six Passenger "32"

$1175 F. O. B. Detroit. Has equipment of two folding and reversible occasional seats in tonneau, foot rest, windshield, mohair top with envelope, Jiffy curtains, quick detachable rims, rear shock absorber, gas headlights, Prest-O-Lite tank, oil lamps, tools and horn. Four cylinders 3⅝-inch bore and 5½-inch stroke. 136-inch wheelbase; 33 x 4-inch tires. Standard color, black. Trimmings, black and nickel.



"20" Runabout, Fully Equipped

$750 F. O. B. Detroit. Four cylinders, 20 H. P., sliding gears, Bosch magneto, top, windshield, gas lamps and generator, oil lamps, tools and horn.

"32" Touring Car or Roadster, shown at right of six-passenger "32," fully equipped, $975 F. O. B. Detroit.

The "32" Coupe

A distinguished addition to a distinguished line

First View, New York Motor Show, Jan. 11-18

In exterior appearance the Hupmobile Coupe is as unobtrusively unique and as well-balanced as the other models of the "32" type.

In interior finish and appointment, it is rich and luxurious—imported Bedford Cord upholstery, with side walls to match and ceiling done in heavy satin; with right-hand control and room for three adults in comfort.

The coupe rounds out the line of Hupmobile pleasure cars, which now includes two touring models and a roadster, all built on the same sturdy "32" chassis, and the well-known "20" Runabout.

The entire line will be displayed at the New York and Chicago shows.

Inspect the cars there, at any other shows or at the dealer's; and you will see why *we* believe the Hupmobile to be, in its class, the best car in the world.

Hupp Motor Car Company

1254 Milwaukee Ave. Detroit, Mich.



Three Passenger "32" Coupe

$1350 F. O. B. Detroit, including equipment of electric lights and 100 ampere battery, electric horn, speedometer with rear extra wide seat for three passengers, 34 x 3½ tires, quick detachable rims, 3 x 4 inch body, rear shock absorber, 10-inch wheelbase, standard color, black. Trimmings, black and nickel.

SPLITDORF

"Always There"



The non-vibrating "T S" SPLITDORF COIL—the latest and most finished of all types of coils, is notable in that it is equally effective with all the newer, as well as older models of the famous SPLITDORF low tension system.

Its neat appearance on the dashboard, with kick switch, ignition button for battery connection and lock and key for the whole operation, is only in keeping with its real effectiveness and durability.

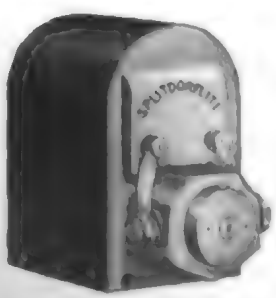
Enclosed in a light waterproof case extending through the dashboard, it has an electrical construction that makes its firing qualities with any engine unsurpassed by any other coil. The coil proper being mounted on the base of the switch, the connecting leads from the switch contacts to the coil are very short while the terminal wires from the coil and battery and magneto leads are brought together in a neat and compact installation.

The SPLITDORFLITE electric lighting generator is the smallest, most compact and only self contained generator on the market. It specially lends itself to instalment on machines not designed for a lighting outfit and can be installed on any make of engine of almost any model.

A positive source of illumination, spotlessly clean, unaffected by weather conditions, the SPLITDORFLITE once properly installed ends an owner's lighting troubles for all time.

SPLITDORF IGNITION devices, including MAGNETOS, PLUGS, COILS, as a matter of fact, should be specified with every form of hydrocarbon motor. We will gladly shoulder all responsibility for any change over to our superior system and guarantee the greatest satisfaction.

If interested in any form of ignition for gasoline motors just write us for our free literature. Our new catalog, our "Racing Record" or our "New Lights For Old" is yours for the asking. Do it TODAY.



Splitdorf Electrical Company

98 Warren Street, Newark, N. J.

BRANCHES

NEW YORK	18-20 West 63rd Street
BOSTON	180 Massachusetts Avenue
PHILADELPHIA	Juniper and Cherry Streets
CHICAGO	1110 S. Michigan Avenue
DETROIT	868 Woodward Avenue
KANSAS CITY	1823 Grand Avenue
SEATTLE	1628 Broadway
LOS ANGELES	1228 South Olive Street
SAN FRANCISCO	430 Van Ness Avenue
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Leakproof
Sootproof
Breakproof

Virtue is its own reward—



NOW $1.00

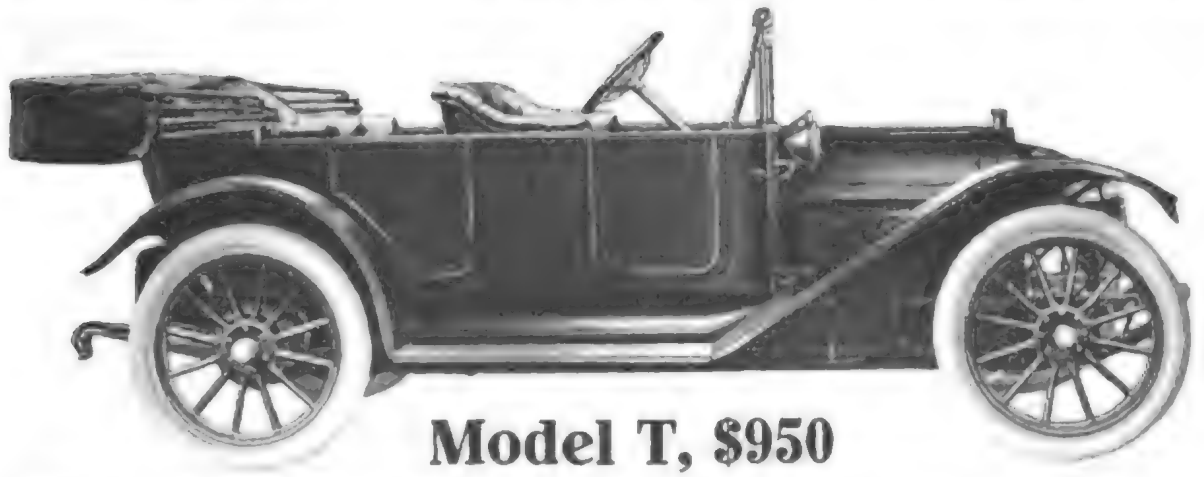
V-Ray Quality its own ad.

More Power
Less Gas
Easiest Cranking

The V-Ray Co.
Makers of the World's Best Spark Plugs
Marshalltown, Iowa

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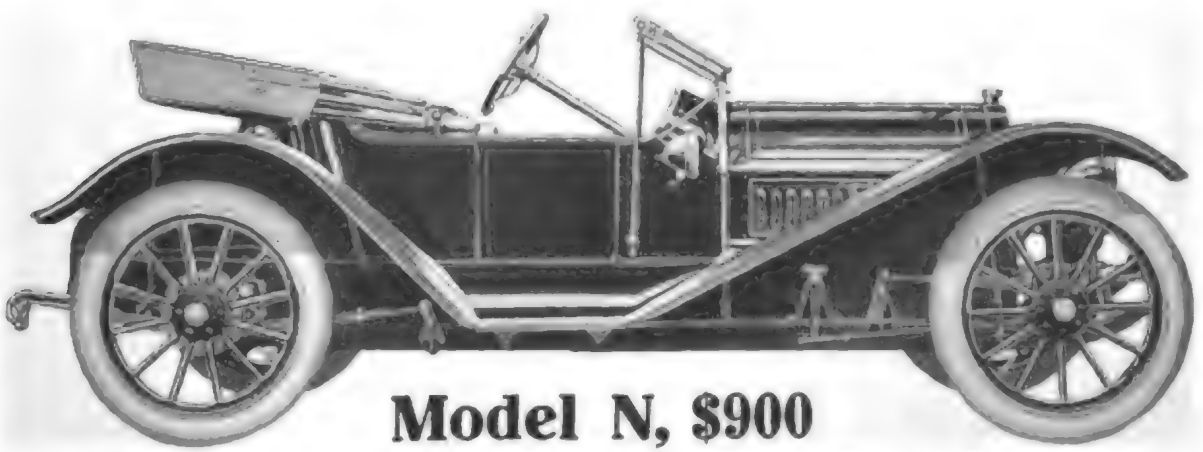
You Will Find Them at the Shows—and Everywhere



Model T, $950

Regal "25" Underslung Touring Car

Tires Morgan & Wright, 32 x 3½ inches. Selective sliding gear transmission, three speed forward and reverse. Motor, four cylinders cast en bloc; bore, 3¾ inches; stroke, 4½ inches; dual ignition; thermo-syphon cooling. Equipment includes nickel plated trimmings, electric lights with option of gas headlights, oil side and tail lamps, and Prest-O-Lite tank; electric horn; foot accelerator; tools and tire repair kit. Top, wind shield and speedometer, $75 extra. Price $950.



Model N, $900

Regal "25" Underslung Roadster

Tires, Morgan & Wright, 32 x 3½ inches. Selective sliding gear transmission; three speeds forward and reverse. Motor, four cylinders, cast en bloc; bore, 3¾ inches; stroke, 4½ inches; dual ignition; thermo-syphon cooling. Equipment includes nickel-plated trimmings; electric lights, with option of gas headlights; oil side and tail lamps and Prest-O-Lite tank; electric horn; foot accelerator; tools and tire repair kit. Top, wind shield and speedometer, $75 extra. Price, $900.

These popular Regal Cars and other Regal Models will be exhibited at the Grand Central Palace, New York Automobile Show, Space 27—and at the First Regiment Armory, Chicago, Space E 3.

See them—hear the story of their success

Regal Motor Car Co., Factories, Detroit, Mich.

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THIS is the non-skid tire that is given preference by tire users who have passed through the school of experience. The Federal Rugged Tread is a non-skid tire that effectively overcomes the difficulties of winter motoring.

FEDERAL
RUGGED TREAD
TIRES

The rugged build and extra thick tread of Federal Rugged Tread Tires make them unusually economical and lasting in service.

The heavy base studs firmly grip the road, giving full power traction under all conditions.

When you next purchase tires, specify Federal Rugged Tread.

Made in Clincher, Quick Detachable Clincher and Straight-Wall (oversize and non-rim-cut) types.

Federal Tires are procurable at leading dealers and auto supply houses.

Federal Rubber Manufacturing Co., Milwaukee

BRANCHES AND AGENCIES—New York, Boston, Chicago, Kansas City, Minneapolis, Denver, Indianapolis, Columbus, St. Louis, Louisville, Omaha, Little Rock, Atlanta, Los Angeles, San Diego, Pasadena, New Orleans, Portland. (Federal Rubber Mfg. Co. of Texas—Dallas, Houston, San Antonio.)

ON DISPAY AT THE SHOWS



A Steel Truck Body Is a Strong Truck Body

Steel is synonymous with strength. When man wants to build strongly, securely and well he fashions his product of steel. Thus we have steel bridges—steel buildings—steel cars.

Budd Motor Truck Bodies are made of steel. Hence they are strong bodies—practically indestructible bodies—proof against wear and tear. They represent business economy—sturdiness—stability—service and safety as well. They prove the truth of the slogan: "A Budd All Steel Body on your truck today eliminates body repair bills tomorrow."

BUDD All Steel BODIES

represent the last word in the art of truck body building—the height of truck body efficiency. They will not crack and warp. They cannot split and rot. They eliminate fire risk entirely and being light in weight are relatively easier on tires.

They are made of a special, patent, leveled, open hearth steel worked into shape by special machinery and made by the exclusive Budd process.

All joints are carefully welded. All seams are concealed. Thus a perfectly smooth surface is produced which guarantees a finish of the very highest character—a finish that is "oven baked on" at a higher temperature than is possible with wood—a finish that practically becomes part of the steel itself and insures the maximum wearing qualities.

All corners are round. No dirt can accumulate. Each type of body can be readily flushed with water, and—as absorption is impossible perfect sanitation is assured.

Yet with all its manifold advantages the Budd All Steel Body actually costs no more than a first class body of wood.

You may be a manufacturer of commercial vehicles or you may intend to purchase a truck—whatever your business, however, it will pay you to investigate the Budd All Steel Body today. We have some facts upon all steel body construction that will be of vital interest to you. Write for it now.

Budd All Steel Bodies can be made in any design and in any desired capacity. We'll gladly furnish estimates.

Edward G. Budd Manufacturing Company

ORIGINATORS OF THE ALL STEEL MOTOR VEHICLE BODY

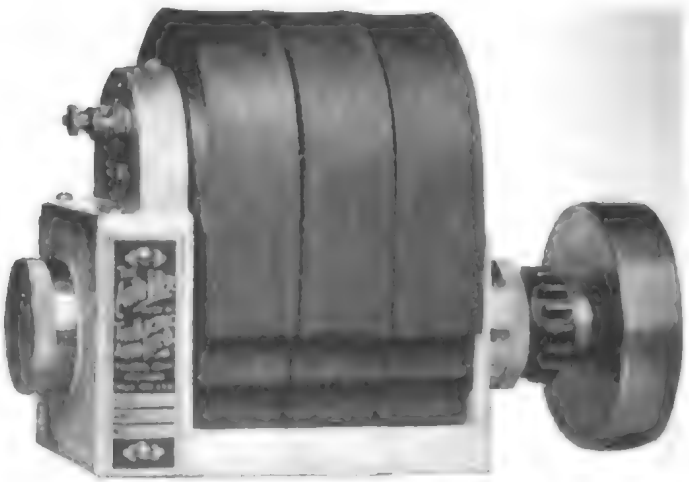
Ontario and I Streets, J-4 **Philadelphia, Pa.**

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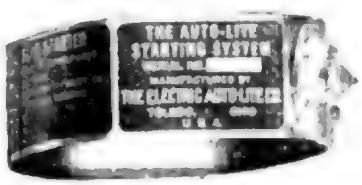
ELECTRIC STARTER

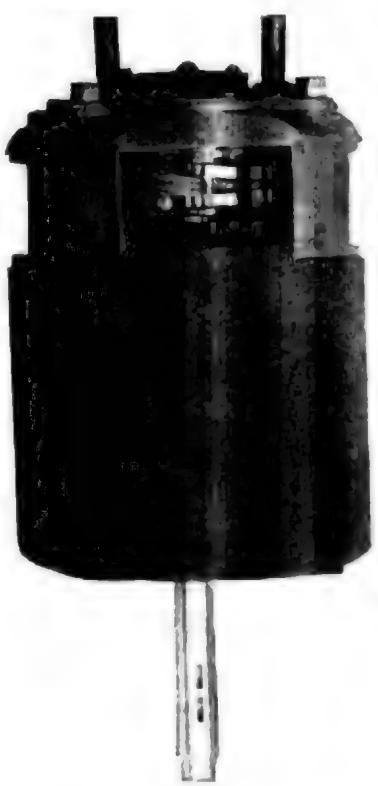
The Auto-Lite 6 Volt Electric Lighting and Starting System

EFFICIENT and SAFE



Has more torque and will crank your engine with more speed than any other system on the market of equal weight.





100 per cent. efficiency. Not a make shift for any car. But a distinctive application for each manufacturer, insuring positive results.

First---The system consists of a powerful 6 volt series wound motor.

Second---Of a simple lighting generator with large capacity. Of few parts and built rugged for automobile usage.

Third---A rugged simple starting switch operated by foot pedal.

Fourth---An ammeter which shows both production and consumption of current.

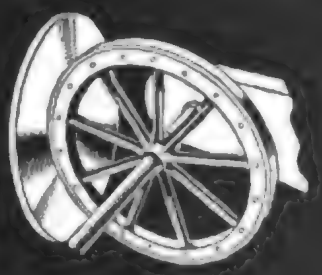
This system is not an experiment as there are thousands in use. We guarantee deliveries, efficiency and service. Insist upon an Auto-Lite system on your car.

THE ELECTRIC AUTO-LITE CO.

Main Office and Factory, Toledo, Ohio

BRANCH OFFICES: New York Kansas City San Francisco

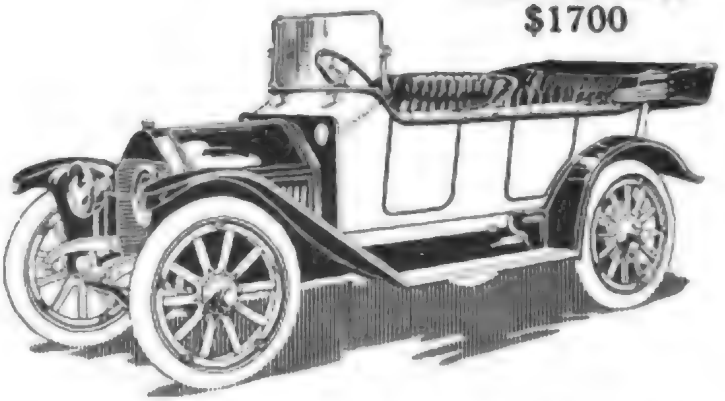
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The Gearless Transmission!

Cartercar's 10th Year Of Success

Model 5-A
Completely Equipped
$1700



Made Good—Under every possible condition the Cartercar has answered every requirement of the most particular drivers. No matter whether the roads have been hilly, sandy or muddy the Cartercar has always given service—the best service.

Few Changes—And during this long period of success and ever increasing popularity, the big feature of the Cartercar—the Gearless Transmission—has practically remained unchanged. It is the feature of the Cartercar which is largely responsible for the extreme reliability and greater efficiency.

Power Economy—This transmission utilizes the power so completely, that the Cartercar will easily carry a full load up a 50% grade—and through deep mud and sand. No gear car can give such valuable service. You take the roads just as they come.

Unlimited Speeds—Another splendid feature of this transmission is the unlimited speeds—all controlled easily and silently with a single lever. There is nothing to confuse the most inexperienced driver.

Greater Tire Mileage—Many Cartercar owners say that they get about twice the usual mileage from their tires. This is because there are no jerks nor jars. You can easily see that this must also mean the utmost comfort.

Electric Starting—A system of electric starting and lighting that has proven 100% efficient under all conditions is employed in the Cartercar. You merely press a small knob to crank the motor. Turn the same knob and you light all or as many of the lamps as you wish.

Compare Prices—When you consider the prices of the Cartercars you should also consider the much greater advantages which it offers. A Cartercar will give the most perfect service over all roads—for any driver—and every day in the year. See these splendid cars before you buy.

At the Shows---Or Ask for Catalog!

Cartercar

Cartercar Company

Pontiac, Mich.

Branches: New York Detroit Chicago Kansas City Atlanta

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OUR EXHIBITS, THIS YEAR,

New York: Madison Sq. Garden, Space 178, Elevated Platform
Chicago: Coliseum, Space 21, Gallery

WILL BE OF UNUSUAL INTEREST

BE SURE AND VISIT OUR BOOTH



27TH STREET PLANT—OVER EIGHT ACRES UNDER ROOF

IN ADDITION TO OUR STANDARD LINE OF FRAME SHAPES AND MISCELLANEOUS PRESSINGS AND FORGINGS, WE ARE SHOWING THE

New Whitney Differential Roller Bearing and New Models Front and Rear Axles

A. O. SMITH COMPANY, Milwaukee

CLEAN-UP SALE ODDS and ENDS !

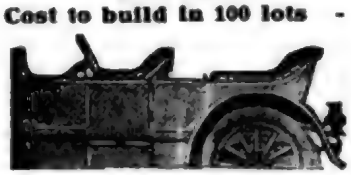
EVERYTHING for the AUTOMOBILE

Body Bargains!!

New FORE DOOR BODIES (5 PASSENGER), 34 in. WIDE, 92 in. long and 61 in. from dash to end of rear door.

Cost to build in 100 lots - $300

Our Price, $100



We offer the public, while they last, these elegant bodies trimmed in the best quality of black leather, painted dark blue, at this immense reduction, because we purchased the entire plant of a well-known automobile manufacturer—$100 CASH—F. O. B.—N. Y. CITY OR CHICAGO.

Lamps HEADLIGHTS, 6-inch; regularly, $12.50; our price $4.50 per pair. | LARGE $25. HEADLIGHTS, 8-inch; regularly $15; our price $5.00 per pair. | Headlights $9. BLACK AND BRASS OIL SIDE LAMPS, regularly $6; our price $3 per pair. TAIL LAMPS; large assortment; all sizes; worth $2.50; our price $1.25.

Tops New Goods, all sizes; regularly $35 to $100; Our Price $15 to $30.

Generators Regularly up to $15; Our Price $1.50.

Carburetors All Sizes and Makes, $2.50 up; regularly up to $25.

Wind Shields All High Grade Wooden and Brass Windshield; regularly $45, our price $5. Other Brass and Clear Vision, also Zig Zag; worth up to $60, all at $10 and $12.50. All complete with fittings.

Tire Irons REGULARLY $2.50; OUR PRICE 85c.

Presto Light Tanks REGULARLY $25; OUR PRICE $13.50.

Electric Horns All Best Makes; regularly $20; Our Price $4.75.

Magnetos BOSCH D. U. 4; regularly $100; our price $30 | Two Cyl. Splitdorf with Coil; reg. $60
SIMMS D. U. 4; regularly $68; our price $22.50 | Our Price $12.50
REMY, SPLITDORF AND BRIGGS; worth $150; our price $17.50.

Speedometers Standard make with trip and season Odometer in head, 60 mile instrument; made to sell at $25; our price $6.50.

Dorian Rim Sets (Demountables) Complete with Bands, Fittings, Wrenches, etc.; regular price up to $80; our price, per set, $15.

Self Starter (Disco and Blitzen) 4-cylinder; regular price $40; our price $7.50. 6-cylinder; regular price $60; our price $10. If a Reliable Self-Starter and This Reduction Appeal to You, Act Quick.

AND 100 OTHER ARTICLES NOT INCLUDED HERE FOR LACK OF SPACE AND ALL AT BARGAIN PRICES—"IF YOU DO NOT SEE WHAT YOU WANT—ASK FOR IT."

Tires

30 x 3 Dunlop	$4.00,	regularly $13.50
29 x 3½ Firsts	12.00,	regularly 19.15
30 x 3 Clincher	8.25,	regularly 13.50
30 x 3½ Clin., Q. D. and Dunlops	11.75,	regularly 19.85
31 x 3½ Firsts	13.00,	regularly 20.55
36 x 4 Dunlops	18.00,	regularly 33.35
35 x 4 Clincher	11.50,	regularly 32.30
34 x 3½ Firsts	14.00,	regularly 23.05
30 x 3 Bolted-ons	8.00,	regularly 17.95

Tubes

SPECIAL JOB, in 30 x 4½ Best Make Tubes.....$3.50

Red Tubes Sizes 3, 3½, 4, 4½ and 5 inches; from $3 to $5; regularly $5 to $11.

NEW CARS Special, at Chicago Store Only

1,850,	7-pass. Touring	$885
1,100	5-pass. Foredoor	685
1,385,	2-pass Roadster	885
1,550,	2-pass. Roadster	845

All absolutely new; best in their class. Makers' full guarantee. Names and particulars on request.

All large size Dunlops, 50 per cent. off lists. All fresh stock, equal to any made. TRUCK TIRES, SOLID RUBBER, NEARLY ALL SIZES; All leading makes. 34 x 4, regular price $78; our price $22.00. Other sizes proportionately low. Also BLOCK WHEELS, complete, regularly $250. Our price, $75.

RUMBLE SEATS; regularly $25 to $40; our price $7.50, $10 and $12.

Also BIG BARGAINS in Motors, Frames, Radiators and 1,000 other articles belonging to the automobile.

If you cannot call, write, 'phone or wire. Prompt attention guaranteed. Do not delay if you want to secure a bargain.

200 USED CARS

Nearly every standard make represented here by cars that are good and merit the title.

Second Hand in Name Only and Lowest Prices in the Trade

1708 to 1718 Broadway (54th) N. Y. CITY **TIMES SQ. AUTO. CO.** **1210 to 1212 Michigan Avenue - CHICAGO**

LARGEST DEALERS IN THE WORLD IN NEW AND USED CARS AND ACCESSORIES

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Owners of Pleasure Electrics:

Don't Let Tires Annoy You

No use of it—not a particle. You can have tires on your electric that will never bother you—tires that won't puncture, or blow out or skid—tires that make your car most comfortable and that protect its delicate mechanical parts.

And with these tires come greatly lessened upkeep—the end of tire repairs—the end of carrying a fifth tire—the end of frequent replacement. (The Motz Non-Skid Cushion Tire is guaranteed for 10,000 miles, one year.)

This tire is in no sense an experiment. Four years have proven its worth. It is far the most popular tire now used on electric cars. Every leading electric car maker now includes the Motz as standard equipment. In two years the demand for this tire has multiplied 10 fold.

All due to the extra quality and quantity of rubber and the patented construction (note the double, notched treads; the undercut sides; the slant-wise bridges).

USE TROUBLE-PROOF
Motz Non-Skid Cushion Tires

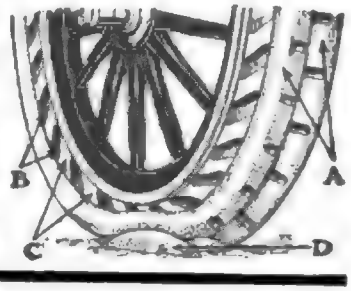
Whether you are buying an electric, or tires for an electric, be sure to investigate the MOTZ. Thus you'll end all tire annoyance and greatly reduce your tire bills.

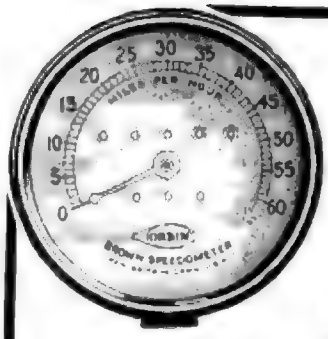
These tires are easily applied to any standard clincher, universal quick detachable or demountable rim.

A postal, sent today, brings our latest Tire Book 58, by return mail.

THE MOTZ TIRES & RUBBER CO.
Akron, Ohio.

BRANCHES—Boston, 4 Dundee St.; Chicago, 2023 Michigan Ave.; Cleveland, 1932 Euclid Ave.; Detroit, 999 Woodward Ave.; Kansas City, 409 E. 15th St.; Los Angeles, 336 W. Pico St.; New York, 1737 Broadway; Philadelphia, 1409 Race St.; Pittsburg, 300 N. Craig St.; St. Louis, 5187 Delmar Blvd.





You can read it from the rear as well as from the front seat.

The clear and distinct marking of the dial, and the absolute rigidity of its pointer are invaluable features of the

CORBIN-BROWN SPEEDOMETER

insuring easy and accurate reading, no matter how fast your car may be traveling.

Absolute accuracy is assured by mechanical simplicity.

The entire mechanism practically consists of two compound governors.

There are no delicate or complicated parts to jar loose or to allow the instrument to grow inaccurate and worthless. Registers low mileage just as accurately as high.

Calibrated by hand. Built with precision of a high-grade watch.

On sale by leading jobbers and accessory dealers everywhere. Write today for catalogue.

The Corbin-Screw Corporation Division
(The American Hardware Corporation)
213 High Street **NEW BRITAIN, CONN.**

BRANCHES: NEW YORK, CHICAGO, PHILADELPHIA
Makers of the celebrated Corbin Coaster Brake for Bicycles and Motorcycles.

IF YOU ARE INTERESTED IN MOTORCYCLES

THE BICYCLING WORLD and MOTORCYCLE REVIEW

WILL INTEREST YOU

Published Every Tuesday at
1600 BROADWAY, NEW YORK

$2.00 Per Year **Specimen Copies Gratis**

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They Add Little to the Cost— but Much to the Car

The valve stem is not an important item in the cost of the car.

The best valves cost, at most, only a few cents more than the inferior ones—and this means little to the man who makes the car.

But to the man who buys the car it often means the difference between a smooth running, powerful machine and a troublesome, unsatisfactory one.

Loss of power and consequent waste of gasoline and noisy, clattering motors are common troubles that are often traced back to cheap valve stems.

We have found in years of experience that there is a right way to make the valve stem for every motor. The heads are made from material which will not warp in the terrific heat and which the gases will not pit or corrode. The stems are made from stiff carbon steel which stands the action of the valve mechanism better than any other material.

Send blue prints of the valve stems you use and particulars concerning them. Let us tell you what they would cost, ground, finished and ready to seat.

The Electric Welding Products Co.
CLEVELAND, OHIO

BENZ

Since the introduction of BENZ cars to the motoring public of America no car has attained such world-wide supremacy as to its construction, standing up quality, and material. The new type of 35 and 50 H. P. BENZ models are the last word in automobile construction.

The noticeable features of this type of BENZ cars include the offset crank shaft, smokeless oiler, and SILENT CHAINS instead of timing gears.

The BENZ Carrosseries are noted for their beautiful lines and thorough comfort.

To those desiring AGENCY of this car the Benz Company will offer special terms. We want RELIABLE, ENERGETIC agents to further our interests for both BENZ pleasure cars and BENZ-GAGGENAU trucks, which today stand recognized by those who know, as the leading 6-ton truck. Wire or write us, no matter where you are.

Our PRICES compete with LEADING AMERICAN makes.

BENZ AUTO IMPORT COMPANY OF AMERICA
250 West 54th Street **New York, N. Y.**
Direct Branch of Benz & Cie., Mannheim, Germany.

TIRE ECONOMY
IS MEASURED BY
TIRE INFLATION

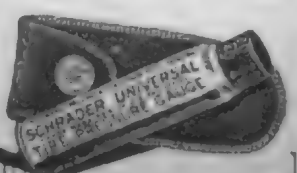
You Carry Tire Insurance When You Carry A

Schrader Universal Tire Pressure Gauge.

AND USE IT.

ASK YOUR TIRE MAKER.
For Sale by Tire Manufacturers, Jobbers, Dealers, Garage Men and
A. SCHRADER'S SON INC.
33 ROSE ST. NEW YORK

PRICE $1.00



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"In Exchange for your empty tank, accept only a genuine Presto-O-Lite Tank, filled with genuine Prest-O-Lite Gas."

This is the message that is going to Prest-O-Lite users everywhere.

In it there is a hint for the wise dealer, as well.

You know that no imitator of Prest-O-Lite has ever sucessfully imitated Prest-O-Lite Service.

You also know that no imitator ever made good the large claim "more gas and better gas than Prest-O-Lite."

So does your customer.

Imitations are getting harder and harder to sell. There are now mighty few dealers trying it.

Most of those who yielded to the old but ever tempting claim "More Profits" have come back home.

To the dealer who is still trying to force imitations on people who won't have them, perhaps because he has money tied up in them, we can only say:

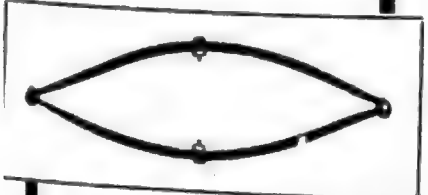
"The sooner you resume earning your good old Prest-O-Lite profit, the sooner you will make your income what it used to be."

The Prest-O-Lite Co. 287 E. South St. Indianapolis, Ind.

Canadian General Office and Factory, Merritton, Ont.
Branch offices and Service Stations in all principal cities.
Charging Plants in all parts of the country.
Extensive foreign service.

Exchange Agencies Everywhere

Penn Springs



Penn Spring Works

BALDWINSVILLE
NEW YORK

PENN SPRINGS are tested for resiliency and tensile strength far beyond any point that could be reached in every day service. They are guaranteed against fatigue and through the special grades of steel and methods of construction they will give service "plus."

Car manufacturers can make our engineering force part of their organization in the work of producing springs that are true in even load carrying, resilient and engineered to fit the particular car for which they are designed.

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DEALERS: A million motorists will have tire trouble in 1913. There is a demand for a **reliable,** inexpensive vulcanizer that can be used by anyone, anywhere—a vulcanizer that will mend tube punctures as perfectly as the most elaborate plant.

VUL-KIT REPAIR VULCANIZER KIT $2

The only inexpensive vulcanizer that actually **vulcanizes** a repair clear through because it is the only one in which the vulcanizing temperature is maintained long enough to cure the raw rubber. Its ever-present fuel, gasoline, is converted into a gas by the patent generator which distributes the flame over the vulcanizing surface at just the right intensity

Other exclusive Shaler features are a handle that is cool enough to permit moving the vulcanizer the moment the repair is finished, asbestos plate inlaid in tube shelf to retain heat and prevent pinching tube, and universal clamp insuring even pressure to all parts of a repair.

A real SHALER Vulcanizer

Not an experiment, but the product of the largest exclusive vulcanizer manufacturers in the world. Sold under the Shaler guarantee which has made the Shaler line of vulcanizers for motorists and repairmen the standard throughout the auto industry.

Get our trade proposition

Write today and get full details and trade prices on this indispensable accessory. Sooner or later every motorist will get a VUL-KIT from someone.

C. A. Shaler Co.

402 10th St. Waupun, Wis.

SHOCK ABSORBER

ALMOST UNIVERSALLY USED IN FRANCE — JM — THE RAGE IN ENGLAND

50,000 sets sold in Europe alone

in two years after the J. M. made its debut!

United States girdled in one year—

you see the J. M. on high grade cars the country over.

Why?

Because the

J. M. Shock Absorber

has been silently advertised everywhere—by the best advertisement any article can have—personal endorsement of satisfied users.



Because the J. M. does really make riding a comfort; does really reduce tire expense; does really minimize engine wear—by holding the rear wheels on the ground, despite rocks, ruts, and "thank-ye-ma'ams."

The ***Ford J. M.*** makes a Ford the equal in riding qualities of much higher-priced cars—does not arrest or lock the spring action.

See the J. M. at the Madison Square Garden Show. Basement space 658.

Send for our new descriptive booklet "W," and state the make, model, weight, type of body and width of rear springs of your car—so that we may suggest the type of J. M. that is perfectly fitted to your needs.

THE J. M. SHOCK ABSORBER CO.

Main Office and Factory, 210 South 17th St., Philadelphia, Pa.

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QUALITY DURABILITY

ONE, TWO AND THREE TON CAPACITY



LAUTH-JUERGENS TRUCKS ARE THE LATEST IN CONSTRUCTION, most powerful in operation and the motors are guaranteed against defective workmanship and material for the life of the truck. They are positively the highest class trucks made. Two cylinder, one ton, four cylinder, one, two and three-ton. Four speeds forward. Herringbone ball bearing transmission made in our own shops of the finest tool steel, three-plate disc clutch, covered by patents owned by us. Send for 1912 Catalog and specifications. Prompt delivery on all models. Large publicity campaign just begun. Our quality will do the rest.

Reliable Agents: Secure Your Territory for 1912 at Once

The Lauth-Juergens Motor Car Co., Fremont, Ohio.

Branches and Agencies

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NEW YORK—West Side Garage & Motor Co., 160-162 101st St.
CHICAGO—The Lauth-Juergens Motor Car Co., 2030-32 Wabash Ave.
NEWARK, N. J.—Merchants Motor Car Co., Essex Building.
DETROIT, MICH.—Biezl Auto Truck Sales Agency, 453 Dix Ave.
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92.5% BOSCH Equipped

Of the 67 cars exhibited at the Importers' Salon, New York, 62 cars employed Bosch Magnetos.

56.7% of these 67 cars were fitted with Bosch Plugs.

Be Satisfied Specify Bosch

Bosch Magneto Co., New York

Croxton

Croxton cars incorporate all of the features for which the buyer looks in the new models. Write for catalog and agency details.

The Croxton Motor Car Co.

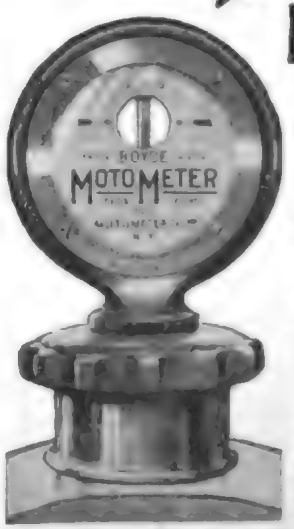
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BOYCE MOTOMETER PAT'S PEND'G

1913's TRADE SENSATION

Know the Exact Heat of Your Motor While Driving



(Front view ½ actual size.)

The Motometer is a watchlike instrument fitted to the radiator cap, protecting the motor from damage caused by improper lubrication, overheating, defective cooling, etc. By means of a red fluid indicator it warns you.

When the Radiator Needs Water

When Oil Supply Is Insufficient

In short, it tells whatever excessive heat tells—a broken water pump, a clogged pipe, a broken fan belt, etc., and tells before the damage is done.

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Finished in black enamel with gold plated or nickel rims.



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Broadway and 58th Street, New York

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Price $10

View from Seat

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Chosen by America's Leading Manufacturers

More Remy Magnetos are being used on 1913 American Automobiles than all other makes combined.

Our contracted sales for 1913 are Five Times Greater than in 1912.

We ship over 13,000 Remys monthly.

This is an expression of the confidence of this country's foremost manufacturers in Remy Magnetos and the facilities of the Remy plant in Anderson, Indiana.

See that a new Remy is on the car you buy.

Exchange your old magneto (any make) for a new 1913 Remy; it will cost you practically no more than repairs on your present ignition system.

The Remy Electric Company, Anderson, Indiana

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Warner Steering Gears, Mr. Manufacturer, are your best pledge of Safety, which means a Big Asset in your business. You are justified in using them by our eight year old reputation for building the highest grade steering gears produced.

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We want you to write for the Solar Catalog before you decide on your motor lamps, for this is the most complete line of lamps on the market. Solar Lamps have been preferred by most motorists for the past fourteen years because of their brilliancy, their style, their strength and their several exclusive advantages—their special short focus lead glass lens mirror reflectors—the patented double ray light projection (in the Solarclipse), giving two distinct fields of light, for city and country use—the new black finish, the only such finish that's proof against heat and moisture—and other features that other lamps lack.

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TRUCK FRAMES

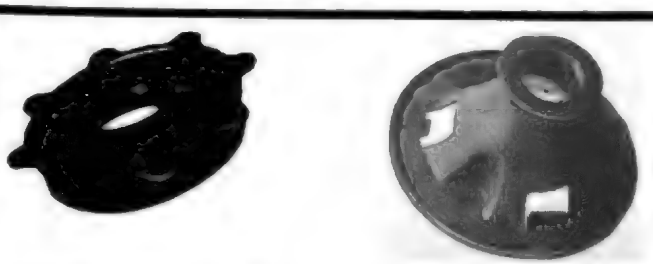
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CLEVELAND, OHIO

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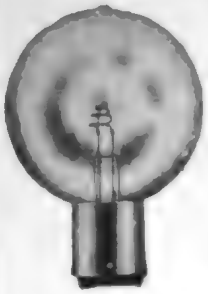
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We are not middle men, we manufacture the complete line and only specialize these particular lamps. We invite comparison as to quality and prices.

Representatives wanted in all large cities.

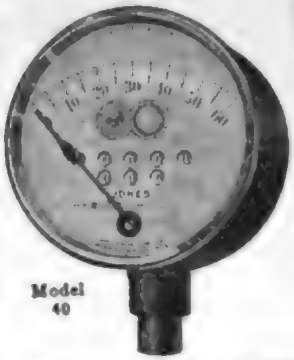
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Model 40

on your car if you want accuracy and quality!

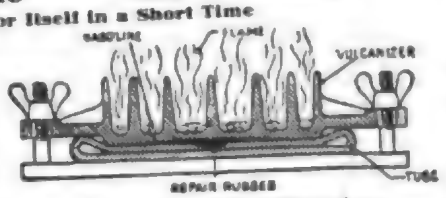
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Saves Time Saves Money

Pays for Itself in a Short Time

Place tube between plates of vulcanizer (see cut); tighten thumbscrews; put a little gasoline in pronged receptacle, and ignite.



Inner Tube Repaired in 15 Minutes

PRICE $1.50 NICKEL PLATED Patent Pending

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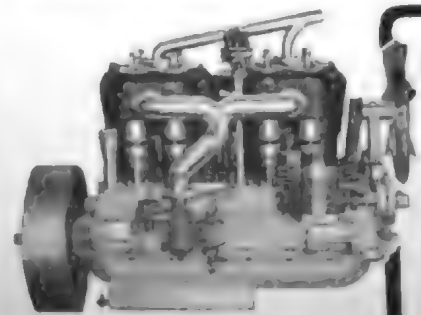
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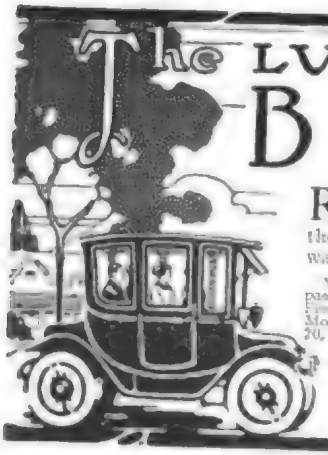
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DEALERS—Add the Century to your line. The electric idea is spreading. Write for our proposition.

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Best on Earth — Kantsamore
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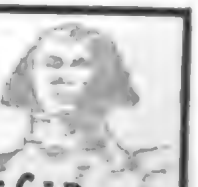
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Built to Last



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BUILT TO LAST

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NEW POSITIVE LOCK STOP

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Detachable Wire Wheels

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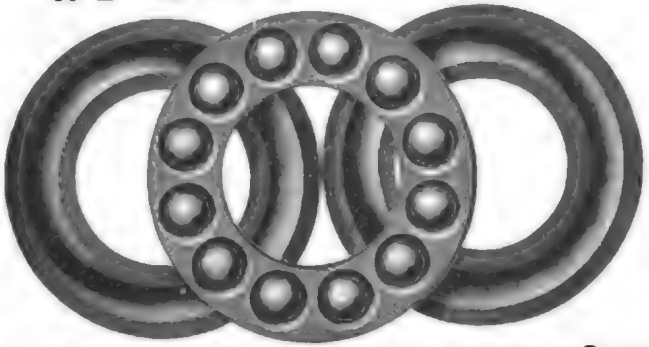
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You can repair **CASINGS** and **INNER TUBES** anywhere in 15 minutes, better than a Repair Shop can do—and for *one cent.*

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Absolutely automatic. Place the patch—attach the Vulcanizer—put in the gasoline—light it. No further attention required. In 15 minutes the job is done.

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Price Complete, **$4.00** Ready for Instant Use

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HAVERS "Six-44" $1850
Touring Car and Roadster Types. 44 h.p. 6 Cylinders. Unit Power Plant, 3-Point Suspension. 122 in. Wheel-Base. 36 x 4 Tires.

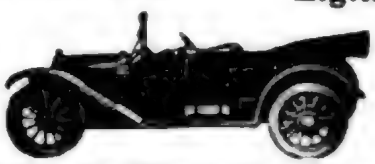
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Touring Car and Speedster Types. Electric Starter. Electric Lights. 55 h.p. 128 in. Wheel-Base. 36 x 4 Tires. Fully Equipped.

Write for full Specifications

HAVERS MOTOR CAR COMPANY, Port Huron, Mich.

MERCER *The Champion Light Car*

Type 35 Series G and H



Electric Lighting and Starting

Mercer power and efficiency are well-known qualities. These features are decidedly emphasized in our new series. The various models offer a Mercer for every reasonable need.

PRICES: $2600 to $2900.

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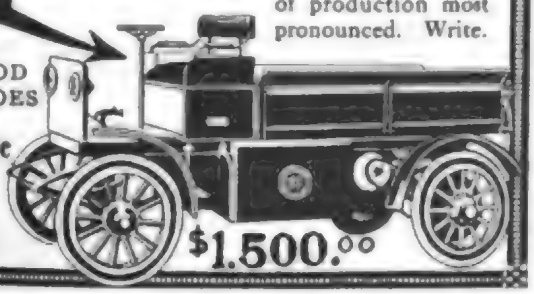
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DEALERS—Here is the first electric truck that sells for about $700 less than any other. Capacity 1000 pounds—Service 100 per cent. more than gasoline truck—Economy of production most pronounced. Write.

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Hook up with COLE

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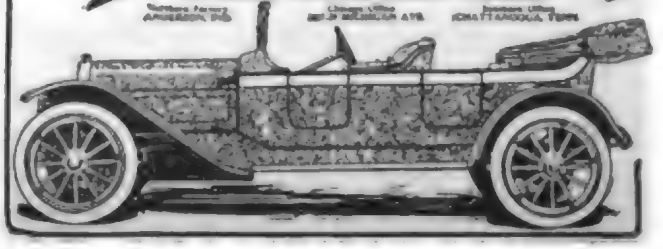
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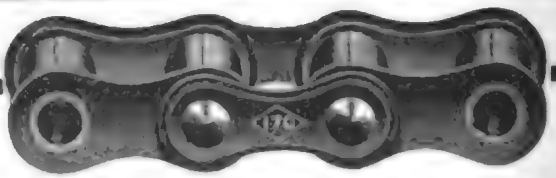
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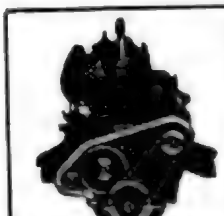
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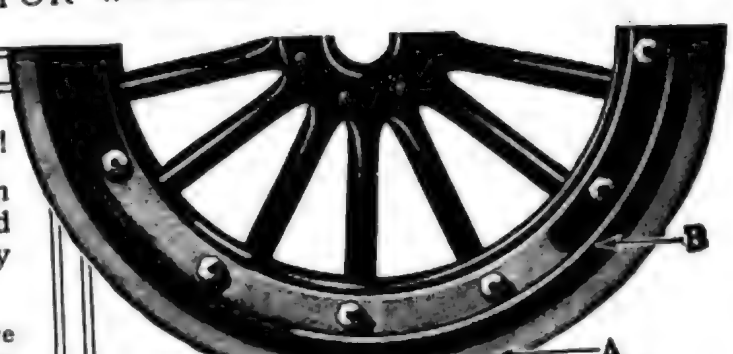
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Showing traction wave in ordinary continuous tire. (A) indicates where wave forms. (B) indicates base where roll and tread separation occur.

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Truck Tires

The lower cut shows how the Firestone Notched Tread overcomes the wave, by preventing its formation. This is *not* an individual block tire, with tread-tearing, metal-retaining plates. The Firestone continuous base is of the same tough, resilient compound as the tread. These tires hold the road, increase traction, absorb all vibration.

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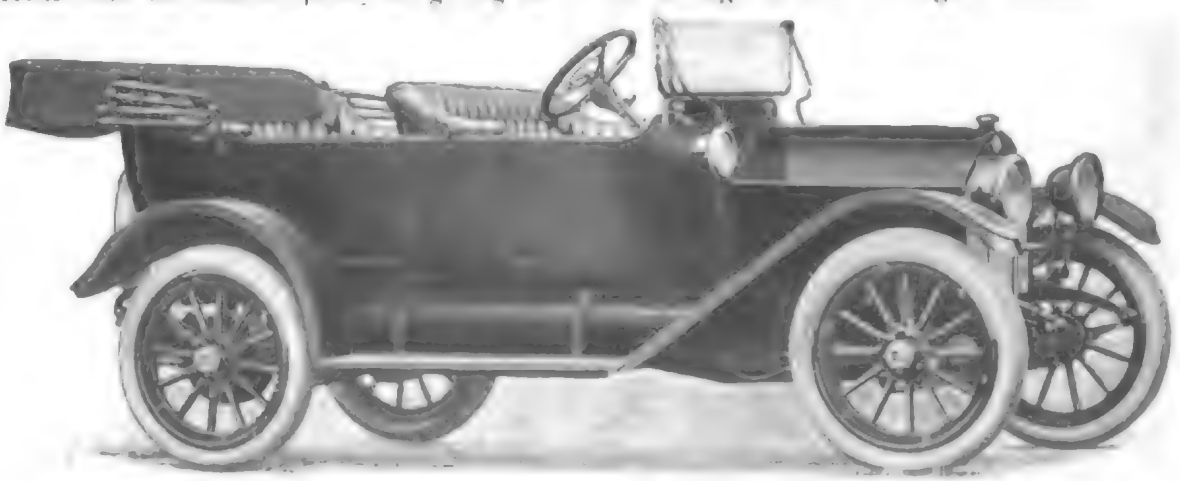
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Marion 37-A, Completely Equipped, $1475

1913 Marion cars are pre-eminent because of their graceful appearance, beautiful finish, class and luxury. They are powerful, sturdy and strong. The completeness of their equipment alone would make them notable.

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These cars are built expressly for those who require reliability, comfort, style and full value for the money. Their position in the 1913 line-up is unique. For ten years they have been manufactured with unusual quality. In equipment they have no superiors. As to their standardization and success, there has never been a question. To produce and market the 1913 series, we have increased our capitalization one million dollars and have recruited experts from the oldest and biggest factories in the industry.

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Vol. XXXIV
No. 5

New York, January 23, 1913

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"It appeals to the man who is car-wise because it is easily operated and does not complicate ignition."

THE MOTOR CAR MFG. CO.

These statements answer the starter question; they offer the highest possible testimony regarding the efficiency of the GRAY & DAVIS Starter.

GRAY & DAVIS, Inc., 55 Lansdowne St., Boston, Mass.

Manufacturers of Automobile Lamps, Dynamos and Electric Starters

Published Weekly by the Motor World Publishing Company, 1601 Broadway, New York

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Bigger and Better Sales for You

The owner---the manufacturer---the dealer---all are vitally concerned in the sale of a car.

Car owners---nowadays---are educated in motor-knowledge. They insist that the car they buy shall have certain standard equipment. And they have learned that Truffault-Hartford Shock Absorbers are standard. They demand them on the cars they buy---they want the assurance of greater comfort---greater efficiency---and the lowest possible upkeep cost.

Car manufacturers---27 of the leading makers---have recognized this demand. And they meet it by equipping their cars with Truffault-Hartford Shock Absorbers---at the factory.

YOU---the progressive dealer---owe it to yourself to insist that the car you sell shall be able to meet this demand. And by meeting it you pave the way for bigger and better sales for the car you represent.



Hartford Suspension Company

EDW. V. HARTFORD, President

Factory, 164 Bay St., Jersey City, N. J.

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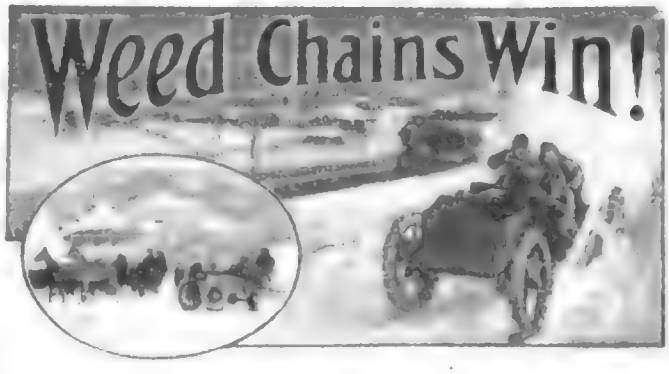
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"Although such great speed has never been attained before on ice by an automobile, and seems wonderful to the inexperienced," said Mr. Koenig, "the average motorist knows that high speed can be made on ice and snow, the same as under normal conditions, if chains are used on all four wheels.

The tire chains on the back wheels give traction and prevent the skidding that would be expected to be dangerous when driving under such conditions, and the pair of chains on the front wheels give steering steadiness.

I find that I can drive my car just as steady over the smooth, glossy surface on the ice, as any driver can pilot his car over a dirt course, and without the least bit of fear."

Weed ANTI-SKID Chains

Insure Perfect Traction—Absolutely Prevent Skidding

Motor Magazine very graphically says: "The actual operating conditions of a motor car are practically reversed in winter. Your problems are entirely different. Instead of worrying about punctures you must think about skidding."

Tire manufacturers have attempted to solve the skidding problem by the manufacture of almost every conceivable style and design of tread—possibly more or less effective when new; but it is no uncommon sight to see these so-called non-skidding tires fitted with **WEED CHAINS** when there is snow or ice on the ground, or when the roads are muddy and slippery.

WEED CHAINS are universally acknowledged to be the only Anti-Skid device that can be absolutely relied upon at all times and under all road conditions.

Forget your worries about snow and ice—slippery roads and pavements. Fully equip your car with **WEED CHAINS** and **feel secure.**

If you haven't a set of **WEED CHAINS**, or if you have a pair for the rear tires only, get a full equipment now. Delay is dangerous. Stop at your dealer's today and **WEED CHAIN** your car to safety.

For sale by all reputable dealers

WEED CHAIN TIRE GRIP CO.

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¶ Highly filtered and not acid treated.

¶ Proper "body" or viscosity.

¶ A "straight run" product.

¶ Made only from Pennsylvania crude.

¶ All these points are considered essential to a good automobile cylinder oil and are all found in

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The front springs are semi-elliptic, 36 inches long and 1¾ inches wide.

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Model 69T springs each possess six sturdy leaves with steel bushing eyes. The shackles are drop-forgings; they are fitted with case-hardened bolts, working in special auto-friction bushings. The spring seats in the rear axle are left free to oscillate on their saddles, insuring great riding comfort.

Model 69T springs must finally endure a vibration test on a special testing machine with a capacity of 6,000 lbs.

We repeat again: $1200 cars have no better springs than the Overland for $985.

Write us for literature. Please address Dept. 50.

The Willys-Overland Company
Toledo, Ohio



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MOTOR WORLD

Vol. XXXIV New York, U. S. A., Thursday, January 23, 1913 No. 5

INVADER OILS TAKEN OVER BY TOMLINSON INTERESTS

Kellom Remains President But Tomlinson Will Manage New $250,000 Company—General Offices Removed to New York.

T. E. Tomlinson, one of the first men in this country to delve deeply into the development of special oils for automobile use, last week concluded negotiations with Chas. F. Kellom & Co. of Philadelphia, Pa., makers of Invader oil, whereby the entire business and good-will of that firm were acquired by a new corporation, styled the Invader Oil Co., of which Tomlinson will be vice-president and general manager.

Charles F. Kellom will be retained as president and the Kellom manufacturing and selling organization will remain intact. H. Dunthorn will become secretary and treasurer of the new company, which has been incorporated under the laws of New Jersey with an authorized capital of $250,000. The general office of the Invader Oil Co. will be located at 80 Broad street, New York City, but the factory will remain at 113 Arch street, in Philadelphia.

In addition to the Kellom sales staff, which includes D. A. Scheu, who for many years covered New England, Tomlinson has associated with him a number of the better known men who were identified with him in his previous enterprises, among whom are H. Dunthorn, A. A. Francesconi, Howard Plowman, Harvey Wilkins, E. Kalkhof, F. Menke and A. Rafelson.

Charles F. Kellom started in the oil business in 1881 and claims to have been the first man to introduce the light oil for automobiles which, since has come into general use. He is possessed of a ripe fund of experience and relates with no little amusement the suspicions with which his light oil first was received. In several instances, it required that he give a guarantee to cover any damage to the buyer's car which it was feared it might sustain. Tomlinson first engaged in the oil business several years ago and made his mark with the Havoline oil, which he created. Later he organized the Wolverine Lubricants Co., which he also built up to large proportions.

Berrys Now a $3,000,000 Corporation.

Berry Bros., the well-known Detroit varnish makers, who heretofore have done business as a partnership, have converted their business into a corporation, Berry Bros., Ltd., with an authorized capital of $300,000. The officers of the company are: President, Frank W. Blair; vice-presidents, Thomas Berry and E. W. Pendleton; treasurer, Geo. H. Russel; secretary, Edwin Lodge; assistant secretary, F. L. Colby; assistant treasurer, W. R. Carnegie; general manager, Jas. S. Stevenson. The business was established in 1855 by the late Joseph Berry and gradually attained its present huge proportions.

Sullivan Revives Tire Dating Bill.

Senator "Christy" Sullivan, who represents the Bowery district of New York City in the State legislature, and who is credited with possessing a keen scent, on Monday last, 20th inst., introduced a bill seeking to compel manufacturers of automobile tires to brand or otherwise state the date of manufacture on each tire produced. It was referred to the Committee on Miscellaneous Corporations. The bill is similar to the one which was introduced last year and which required the automobile tire interests to exert considerable opposition before it was killed.

Randolph Truck in Receiver's Hands.

The Central Trust Co. of Chicago has been appointed receiver for the Randolph Motor Truck Co. of Flint, Mich., the control of which rested with Chicago men. About four months ago the factory occupied by the Randolph company was sold over its head, so to speak, and since that time its affairs have been more or less "in the air."

WILLYS ACQUIRES INTEREST IN ENLARGED FISK COMPANY

Toledo Car Maker Becomes Heavy Stockholder in Massachusetts Tire Plant—Dunn and Fisk Remain.

When, in October last, the Fisk Rubber Co., of Chicopee Falls, Mass., then a $4,000,000 corporation, give up its Delaware charter and reincorporated under the much stricter laws of Massachusetts, with an authorized capital of $10,000,000, the fact naturally gave rise to comment and speculation, but its exact meaning was known to comparatively few.

It became more or less common property that men of influence were about to acquire an interest in the Fisk company, but until early this week the name of the chief figure involved, John N. Willys, president of the Willys-Overland Co., had not escaped. Immediately it was let fall, however, the report spread like wildfire that Willys had purchased the Fisk property, or, at any rate, had acquired control of the controlling Mayo interests.

Willys himself left New York before the report gained circulation, but Harry T. Dunn, president of the Fisk Rubber Co., states the time is not ripe to disclose the details of the plans in view. He admits that Willys had become one of the largest stockholders in the company, but states that he himself and H. G. Fisk, secretary-treasurer of the Fisk company and one of the representatives of the Mayo estate, will considerably increase their holdings and will remain in full charge of the company, which will continue to stand alone. Willys, he added, will neither become an officer or director nor be active in its management.

It is probable that the capitalization of the company will be increased, but to what extent Dunn would not say. He did say, however, that the new flotation already had been underwritten.

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RUBBER GOODS INVOLVED IN NINE-YEAR-OLD BANKRUPTCY

Trustee of Munger Tire Company Seeks to Force Payment of $33,000 on Preferred Stock—"Angel" Who Backed Out.

Legal procedure often proves more lengthy than the litigant expected, but what bids fair to become a record for a long-drawn-out bankruptcy case is that of the once well-known Munger Vehicle Tire Co., which started on its way through the Federal court in New York City in 1904 and now has, through its trustee in bankruptcy, William A. Evans, filed suit in the Supreme Court for New York county against the Rubber Goods Mfg. Co., a United States Rubber subsidiary, in an effort to collect $33,124.25, its only available asset. Before the action is brought to a close the record of time elapsed is likely to be at least nine years.

The present suit has its beginning at the time Louis de F. Munger obtained patents on a tire and formed the National Wheel & Traction Co., with a factory in New Brunswick, N. J.; in 1899 the principals in this company interested William M. Ivins, a director and member of the executive committee of the Rubber Goods Mfg. Co., and the Munger Vehicle Tire Co. resulted. The National company had expended $16,000 in launching the Munger tire, and when the new Munger company was formed with a capitalization of $600,000 common and $100,000 preferred stock, the National was given $16,000 of the preferred, all the rest going to the Rubber Goods company with the exception of qualifying shares to the directors

Of the remaining $84,000 preferred, the Rubber Goods was to pay in money as it was required for the operation of the business, and up to August, 1901, had paid in $50,875.75, when it decided it had been "angel" for long enough and quit. Shortly thereafter bankruptcy proceedings were instituted, and the report of the master in bankruptcy showed that there were claims of $19,286, with an added court and legal fee [illegible] $10,000, making a total indebtedness practically amounted to the money it already had paid for preferred stock up to the time of the failure of the company. The adjudication in bankruptcy occurred January 3, 1905, but since that time the Munger company has remained a corporate body for the purpose of clearing up the tag ends of the business. Just why the matter was permitted to drag along until now is not stated, but it is certain that the Munger trustee has determined to win or lose the $33,000.

After the complaint was filed the Rubber Goods demurred, the Munger company amended its complaint and various motions have brought the time for answering the amended complaint down to the present week, when several technical details are to be disposed of. One of these is that the causes of action be stated separately; meantime the case is moving toward trial.

Lozier and Baltimore Dealer Embroiled.

Albert J. Fleischman, former Lozier dealer in Baltimore, Md., through his assignee, Abe Rosenfeld, instituted a suit in the Supreme Court for New York county this week against the Lozier Motor Co., of Detroit, Mich., asking $5,128.32 as damages sustained by reason of acts of the manufacturing company while he represented it. His claims are: $1,100, commission on a car sold by the Lozier company in his territory to one of his prospects; $1,000, deposited at signing of contract and to be deducted from the price of the last of an order of ten cars, he not being able to sell the ten because the company discontinued the models he was selling; $1,028.32, price of parts returned to the factory; $1,000, company's share of loss on used cars taken in trade, according to agreement; $1,000, amount paid for agency and not returned to him.

Chanslor & Lyons Merge Their Interests.

The Chanslor & Lyon Motor Supply Co., one of the most extensive jobbing concerns on the Pacific Coast, has merged its various interests into what hereafter will be known as the Chanslor & Lyon Co. The change is in name only and does not in any way affect the personnel of the company, whose headquarters, as heretofore, will remain in Los Angeles. The established branches will be continued in San Francisco, Fresno, Port-

FINANCIAL EMBARRASSMENT FOLLOWS PATENT VICTORY

Bank Petitions Searchlight Gas Into Receiver's Hands—Patent Decision May End Prest-O-Lite's Relations With Licensor.

Ill fortune closely followed good fortune into the Searchlight Gas Co. After emerging successfully from the litigation which resulted in a "death sentence" for the Prest-O-Lite patents, the Searchlight company last week was thrown into the hands of a receiver on the petition of the Continental and Commercial National Bank of Chicago, whose claims on notes aggregate $50,000

The petition was filed in the Federal court in Cleveland, the Searchlight's main plant being in Warren, O., although its headquarters are in Chicago, and also are included in the receivership. Horace B. Pearson, of Chicago, general manager of the company, was named as receiver, with authority to continue the business. His bond was placed at $10,000. The company, which had outgrown its resources, assented to the receivership.

According to the complaint in the case, the Searchlight liabilities amount to $200,000 and its assets to $400,000, which, because of their nature, are not easily convertible into cash.

The Searchlight Gas Co. of Delaware, a holding company, with authorized capital of $500,000, is not affected by the proceedings.

The Searchlight company set out to become an active competitor of the Prest-O-Lite interests, but on several occasions, it is stated, the Searchlight property was offered to its big rival, which, however, preferred litigation to purchase.

Incidentally, the overturning of the Claude and Hess patent in the Prest-O-Lite-Searchlight suit may cause an automatic dissolution of relations between the Prest-O-Lite Co. and the Commercial Acetylene Co., since the latter owned the patent and the former had obtained rights of manufacture. The Acetylene company itself, has factories in Harrison, N. J., Atlanta, Ga., and one in Canada and is en-

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UNCLE SAM EXTINGUISHES FOUR NEVEROUT PATENTS

Federal Court Declares Invalid All of Much Exploited Bracket Rights—Uses Vigorous Language in Sweeping Decision.

In the opinion of Judge Cross, of the United States District Court for the District of New Jersey, if the Neverout lamp bracket discloses invention, "it is of a low order," so low that he has declared the patent on it invalid.

It is one of the four patents which the Rose Mfg. Co., of Philadelphia, has brought to bear against a number of manufacturers and jobbers, and while he was in the mood Judge Cross made a thorough job of it. He bowled out and declared invalid not only the lamp bracket patent, No. 883,973, and the license bracket patent, No. 962,220, but the two design patents covering license plate supports, Nos. 41,388 and 41,389.

He rendered the sweeping decision in the suit brought by the Rose Mfg. Co. against the E. A. Whitehouse Mfg. Co. and the La Compte Mfg. Co. of Trenton, N. J., which had been pending for nearly two years.

When the suit was filed, the defendants, who were sued jointly, entered a demurrer which not only attacked the validity of the patents but claimed that such jointure constituted multifariousness. The demurrer, however, was over-ruled by Judge Rellstab, who admitted that the Rose patents left his mind in "a state of dubiety" and he, therefore, ordered the case to trial.

Judge Cross, who just has decided it, employs vigorous language in declaring all of the patents involved without merit, and, so far as concerns the Neverout lamp bracket, declared that the idea embodied is of the "simplest character and of questionable patentability," and when considered in relation to the prior art, "it becomes manifest that the attempt further to dilute this simple idea and then protect it by means of a patent should not be fostered." He holds that E. M. Rosenbluth, the patentee, "merely took what was old and commonplace and applied it to a new use," his lamp bracket being akin to similar devices which have been employed for household lamps and for signboards and other things. In declaring invalid also the license tag bracket, covered by patent No. 962,220, granted to W. D. Hughes, the court stated that Rosenbluth's patent of itself was sufficient to defeat it.

The two design patents involved were held to be neither new, original nor ornamental. Judge Cross said that such a patent "must exhibit something which appeals to the esthetic faculty of the observer," and added that a valid design patent does not necessarily result from the mere filing a certified photograph of a manufactured article. Every feature of the Neverout design, he stated, "is mechanical and functional and not ornamental," adding that "even ordinary rivet heads are made to appear as beautiful circles in this scheme of ornamentation."

Klaxon Joins Issue With Sparton.

The Lovell-McConnell Mfg. Co. of Newark, N. J., has accorded a quick and warm "welcome" to the very newest motor driven horn, the Sparton, made by the Sparks-Withington Co. of Jackson, Mich., which they claim externally and internally closely resembles the Klaxet. The "welcome" took the form of the institution of suits for infringement against three New York dealers whose cars were equipped with the Sparton signal—i. e., the Jackson Eastern Distributors, the Haynes Automobile Co. and the Garland Automobile Co., the latter of which handles the Velie car.

The actions were instituted in the United States District Court for the Southern District of New York and allege infringement of the Klaxon patents No. 923,048, 923,049 and 923,122. The Lovell-McConnell people explain that they did not proceed directly against the Sparks-Withington Co. because of their inability to purchase any of the Sparton horns which were exhibited by their makers at the New York show.

"35%" Sues Maker of Apico System.

The 35% Automobile Supply Co., of New York City, filed a suit Friday last, 17th inst., in the Supreme Court for New York county against Vincent J. Apple, trading as the Apple Electric Co., of Dayton, O., demanding judgment for $2,832.15 on an advertising contract; it alleges that Apple agreed to supply the "35%" with Apico lighting systems to the value of $3,600 in the course of a year, in exchange for which the system was to be advertised in the more or less notorious monthly circular issued by the "35%," which caused several similar suits. It is alleged that Apple furnished goods to the amount of $767.85 and then broke the contract.

Sue Over Velvet Shock Absorber Deal.

John W. Blackledge, who is the principal part of the John W. Blackledge Mfg. Co., of Chicago, manufacturer of Velvet shock absorbers, has instituted suit in the Supreme Court for New York county against Geo. Sumner, Inc., who a short time ago undertook to act as metropolitan agent for the Blackledge product; failure to fulfil the terms of the contract is the basis for the suit; damages of about $1,000 are sought.

RECEIVERSHIP TO UNRAVEL FIRESTONE-COLUMBUS KNOTS

Old Buggy Company Embarrassed by Its Gasolene Cars—Friendly Creditor Averts Drastic Action to Assist Reorganization.

In order to forestall threatening and more drastic action on the part of less friendly creditors, Valentine & Co., the New York varnish makers, on Saturday last, 18th inst., applied for and secured the appointment of a receiver for the Columbus Buggy Co., of Columbus, O. The court named Daniel McLarin, of Cincinnati, to fill that office and fixed his bond at $100,000. He is a brother-in-law of Charles E. Firestone, secretary of the Columbus Buggy Co., and took charge immediately. The other officers of the company are C. D. Firestone, president, and O. H. Perry, treasurer.

The assets of the Columbus Buggy Co., which is capitalized at $2,000,000, are estimated to be $1,000,000; its liabilities slightly exceed $600,000.

In addition to horse-drawn vehicles, which it has manufactured for more than a quarter of a century, the company has been manufacturing the Firestone-Columbus gasolene car and the Columbus electric. It is stated that, while the production of horse vehicles and electrics has been profitable, the earnings have been more than eaten up by the manufacture of gas cars, which it is intimated may be discontinued when the reorganization, which it is expected will follow the receivership, is brought about. It also is stated that the reorganization will be thorough and may result in a general change of management.

According to the petition of Valentine & Co., whose claim amounted to $3,436.61, the Columbus company is doing a large business and has on its books orders to the value of $1,250,000, but its credit is so seriously impaired that a receivership was necessary to save the situation from more drastic action on the part of creditors who not only refused to extend further credit, but threatened to institute suits to enforce their claims. In all there are more than 280 creditors.

With a receivership in force, and with the business continuing without interruption, it is believed that all of the stock on hand will be converted into sufficient money to pay all obligations.

The company was organized in the late 70's and grew into one of the largest producers of buggies in the world, several other manufacturers have been merged with it, among them the Peters Dash Co. About a generation ago it became financially in-

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volved and passed into the hands of a receiver, from which, however, it emerged successfully. At that time the Peters interests were deeded to C. D. Firestone, then one of the principal owners, and at present the principal owner of the concern, for the purpose of effecting a compromise with the creditors. Recently the common pleas courts, upon the application of the Peters heirs, declared that this deed was one in trust and not in fee simple. The effect of this decision, if sustained in the higher courts, will be, it is said, to compel an accounting to the Peters heirs for profits which have been earned since the compromise was effected.

Flames Wipe Out Buick Foundry.

An explosion in the aluminum foundry of the Buick Motor Co. in Flint, Mich., on Friday last, 17th inst., completely destroyed that structure and the machinery which it contained. The loss is estimated at $40,000. The foundry was the only frame building in the entire plant and proved an easy prey to the fire which followed the explosion.

Mohawk Acquires Stein Double Cushion.

The Mohawk Rubber Co. of Akron, O., which recently was incorporated with an authorized capital of $350,000, has taken over the plant of the Stein Double Cushion Tire & Rubber Co. in that city. It is stated that it will considerably enlarge the property.

ENGLAND TAKES FEWER CARS BUT EXPORTS KEEP GAINING

Shipments During November 32 Per Cent. Better Than in Same Preceding Month—Britain's Decrease 59 Per Cent.

The fact that shipments of American cars to Great Britain have decreased $524,559 during the last four months seems to have little effect upon the exports as a whole, for while the purchases of the United Kingdom for November last were 59 per cent. less than in the corresponding month of the previous year the total exportations to the twelve geographic divisions into which Federal statisticians separate foreign lands was 24 per cent. greater in number and 32 per cent. in valuation than in November of 1911. The shipments in November, 1911, were 1,364 cars, valued at $1,382,804, and in November, 1912, 1,689 cars, valued at $1,807,066, gains of 325 in number and $510,279 in valuation. The United Kingdom's comparative imports for Novembers of 1911 and 1912, respectively, were 397 cars at $334,151 and 164 cars at $139,222.

Of the twelve divisions all but three registered gains, and of these the heaviest gainer in numbers and value was Canada, with 215 more cars and an increase of $183,588 in valuation. In per centage of gain in valuation the ranking of the divisions was: Italy 566, Other Europe 423, France 395, Germany 389, Other Countries 130, Asia and Other Oceania 114, South America 112, Canada 50, and West Indies and Bermuda 48. The losses were United Kingdom, $194,929, or 58 per cent.; Mexico, $29,815, or 37 per cent., and British Oceania, $3,513, or 1 per cent.

The average value of cars shipped from the United States in the two Novembers was: All foreign countries, 1911, $1,014; 1912, $1,069; United Kingdom, 1911, $842; 1912, $848; American possessions, 1911, $1,566; 1912, $1,804. In the first 11 months of 1911 the average value of the cars shipped to foreign countries was $1,248, and in that period of 1912, $997, a decrease of $251, or 20 per cent. Parts exports aso gained by $86,017, or 41 per cent.

Of the non-contiguous American possessions Hawaii recorded the greatest gain in number, augmenting its purchases by 13 cars, or 30 per cent., but the Philippines assumed leadership in monetary gain, taking cars of an increased valuation of $20,034, or 109 per cent. Porto Rico fell behind by 45 cars, or 66 per cent., and $63,019, or 70 per cent., thus causing the possessions as a whole to lose by 30 cars and $21,785, respective percentages of 22 and 10. Since Alaska in November, 1911, took no cars and in that month of 1912 bought one, valued at $500, its gain per cent. is not expressible in figures. The statistics in detail follow:

	November				Eleven Months Ending November					
	1911		1912		1910		1911		1912	
	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.
France	19	$12,684	83	$62,727	228	$674,426	385	$425,714	608	$502,040
Germany	11	6,584	46	32,197	105	303,468	106	118,710	438	348,398
Italy	4	2,445	13	16,279	107	348,428	171	194,784	267	240,715
United Kingdom	397	334,151	164	139,222	1,399	2,390,684	3,173	2,741,524	4,371	3,302,918
Other Europe	20	15,264	99	80,086	447	701,550	705	650,642	1,439	1,178,847
Canada	256	366,774	471	550,362	3,331	3,499,703	4,556	5,137,685	6,804	8,255,134
Mexico	52	81,309	35	51,494	325	594,899	262	432,316	233	372,086
West Indies and Bermuda	27	32,440	43	48,114	203	309,165	263	303,434	316	331,230
South America	143	163,824	273	346,995	359	409,266	909	1,131,182	1,859	2,164,983
British Oceania	312	269,333	263	265,820	650	505,776	2,041	1,871,716	3,112	2,852,005
Asia and other Oceania	97	72,016	148	154,035	281	329,562	742	719,083	1,469	1,464,358
Other Countries	26	25,980	51	59,735	251	272,978	247	264,141	671	630,463
Total cars	1,364	$1,382,804	1,689	$1,807,066	7,686	$10,339,905	13,560	$13,990,931	21,707	$21,643,177
Parts (not including engines and tires)	.....	214,638	.....	300,655	.....	1,804,436	.....	2,951,188	.....	4,236,765
Total cars and parts	1,364	$1,597,442	1,689	$2,107,721	7,686	$12,144,341	13,560	$16,942,119	21,707	$25,879,942
To American Possessions—										
Hawaii—										
Cars	44	87,960	57	101,609	355	692,176	324	635,038	561	894,030
Parts (except engines and tires)	.....	3,299	.....	10,722	.....	53,986	.....	78,372		21,240

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The Week's Incorporations

Toronto, Ont.—McKinnon Motor Vehicles, Ltd., under Ontario laws; authorized capital, $100,000; to manufacture and deal in motor cars.

Muskogee, Okla.—Kitto Garage, under Oklahoma laws; authorized capital, $1,000; to operate a garage. Corporators—A. L. Kitto, Harry Kitto, S. V. Kitto.

Springfield, Ill.—Reliance Supply Co., under Illinois laws; authorized capital, $2,500; to deal in motor car supplies. Corporators—C. M. Sutton and others.

Louisville, Ky.—Speedway Tire Co., under Kentucky laws; authorized capital, $250,000; to manufacture motor car tires. Corporators—H. L. Lewman and others.

Akron, Ohio—Mohawk Rubber Co., under Ohio laws; authorized capital, $350,000; to manufacture rubber goods. Corporators—R. M. Pillmore, J. K. Williams, S. S. Miller.

Columbus, Ohio—Park Motors Co., under Ohio laws; authorized capital, $30,000; to deal in motor cars. Corporators—Scott Van Etten, Charles Parkison, Amelia Van Etten.

Indianapolis, Ind.—Ray Harroun Co., under Indiana laws; authorized capital, $50,000; to deal in motor cars. Corporators—Ray W. Harroun, L. R. Townsley, U. G. Baker.

Cleveland, Ohio—Alco Motor Supply Co., under Ohio laws; authorized capital, $10,000; to deal in motor car supplies. Corporators—M. Kluger, C. K. Halle, Frank Butler.

Akron, Ohio—S. & M. Tire & Rubber Co., under Ohio laws; authorized capital, $20,000; to deal in motor car tires. Corporators—Alois Michler, Erwin S. Kintz, Charles M. Smith.

Jersey City, N. J.—National Welding Co., under New Jersey laws; authorized capital, $25,000; to manufacture motor car parts. Corporators—E. P. Hoyt, S. H. Culver, J. W. Phillips.

Quincy, Ill.—Machinery & Motor Co., under Illinois laws; authorized capital, $25,000; to operate an automobile repair shop. Corporators—F. H. Wilms, B. Kinsey, H. V. C. Tingley.

Jamestown, N. Y.—Peterman Garage Co., under New York laws; authorized capital, $5,000; to operate a garage. Corporators—Otto G. Peterman, August Peterman, Myrtle S. Peterman.

Albany, N. Y.—Kupke Auto Renting Co., Inc., under New York laws; authorized capital, $1,000; to operate a motor service. Corporators—Eugenie C. Kupke, Robert E. Male, Willard McCune.

Cincinnati, Ohio—Automobile Clearing House Co., under Ohio laws; authorized capital, $2,500; to deal in motor cars. Corporators—Thomas A. Reilly, Edwin P. Bernardi, Samuel D. Bromley.

Cincinntai, Ohio—Model Garage Co., under Ohio laws; authorized capital, $10,000; to operate a garage. Corporators—Edward Hine, Martin Fette, Carl Reichelman, Clara Heine, Della Cottrell.

Detroit, Mich.—Detroit Flash Curtain Co., under Michigan laws; authorized capital, $25,000; to manufacture motor car curtains. Corporators—Fred J. Schaffer, Wm H. Goodfellow, Harry M. Vaughn.

Indiana Harbor, Ind.—Harbor Garage & Machine Co., under Indiana laws; authorized capital, $7,500; to operate a garage and repair shop. Corporators—Gustave Jernberg, August Jernberg, Charles Saluski.

Buffalo, N. Y.—F. A. M. Auto Supply Co., under New York laws; authorized capital, $20,000; to deal in motor car supplies. Corporators—Frank A. Marburg, John B Green, Richard H. Templeton, all of Buffalo.

Brooklyn, N. Y.—Hoyt Garage, Inc., under New York laws; authorized capital, $1,000; to operate a garage. Corporators—Louis C. Brooks, 354 Baltic street; Walter J. Kelly, 2063 East 14th street; Charles Blaken, 290 2nd street.

Utica, N. Y.—F. P. Miller Motors Corp., under New York laws; authorized capital, $5,000; to deal in motor cars. Corporators—Henry R. Beebe, 15 Avery Place; William T. Cantwell; 306 Bleeker street; Francis P. Miller, 333 Bleeker street.

New York, N. Y.—Co-Operative Used Car Co., under New York laws; authorized capital, $3,000; to deal in motor cars. Corporators—Joseph B. Bauer, 2031 Seventh avenue; Louis Ezechiel, 430 Columbus avenue; John Curtis, 600 West 139th street.

New York, N. Y.—Auto Buyers' Co., of America, Inc., under New York laws; authorized capital, $1,000; to deal in motor cars. Corporators—Julius Lichtenstein, 790 Riverside Drive; John P. McClellan, 646 Lenox avenue; Arthur A. Hill, Larchmont.

New York, N. Y.—Gas Saver Sales Co., under New York laws; authorized capital, $25,000; to manufacture motor car devices. Corporators—H. Clarence Fisher, Broadway & 80th street; John H. Miller, 61 West 108th street; Eugene Cable, 56 West 23rd street.

Brooklyn, N. Y.—Pratt-Hendricks Co., under New York laws; authorized capital, $1,000; to deal in motor cars. Corporators—William H. Pratt, 343 Willoughby avenue; William J. Hendricks, Jr., 223 Eastern Parkway; George L. Robinson, 70 William street.

New York, N. Y.—Miller Tire Sales Co., under New York laws; authorized capital, $5,000; to deal in motor car tires. Corporators—Harry C Miller, 608 Warburton avenue, Yonkers; Harrison C. Mills, 193 Woodworth avenue, Yonkers; Warren A. Schenck, 473 West 158th street, New York City.

Recent Losses by Fire.

Mason City, Ia.—Russell's Garage, stock destroyed. Loss not given.

Fen Argiye, Pa.—Arbogast & Bastian Co., garage damaged. Loss, $25,000.

Flint, Mich.—Buick Motor Co., aluminum foundry destroyed. Loss, $40,000.

Omaha, Neb.—Prest-O-Lite Co., 11th and Seward streets, plant damaged. Loss, $6,000.

New York, N. Y.—Auto Holding Co., 762-8 West 47th street, building damaged. Loss, $3,000.

Exeter, Cal.—Benjamin Smith, garage and machine shop damaged. Loss not given.

Lincoln, Neb.—P. C. Smalley, 12th and P streets, garage and 15 cars damaged. Loss not given.

Woonsocket, R. I.—Joseph N. Bouier, automobile and wagon paint shop damaged. Loss, $1,000.

Toledo, O.—Willys-Overland Co., one-story, frame shipping room, six freight cars and 18 automobiles damaged.

Van Wert, O.—Charles M. Smith, garage and 12 cars damaged by fire following gasolene explosion. Loss not given.

Cincinnati, O.—Fisher Automobile Co. and Cruse Auto Co., 808 Race street, building and contents damaged. Loss, $12,000.

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METROPOLITAN DEALERS IN ANTI-THEFT ASSOCIATION

Seek to Prevent Fraudulent Securing of Cars and Accessories—Two Arrests—Loss $75,000 in Four Months' Time.

Although it was organized four months ago, the Automobile and Accessories Dealers' Protective Association of New York City has kept its existence a secret until now, that it might better accomplish the task for which it was formed, its object being to break up a system of obtaining goods under pretenses so questionable as almost to constitute outright theft; the dealers report they have suffered a combined loss of $75,000 within the last six or eight months, of which $25,000 represents the valuation of cars. More than $200,000 is said to have been mulcted from tradesmen and individual owners together.

As the result of the association's efforts there have been arrested Louis Kaplan, known as the proprietor of the East Side Trucking Co., of 336 East 27th street, and Abraham Vogel, whose real name is said to be Bogus, who represented himself as the owner of the Willoughby Street Garage in Brooklyn. The alleged swindlers are said to have followed the scheme of approaching a car dealer to whom they would show a garage filled with cars, many of them the property of confederates; the prospective buyer would then offer to purchase a car, saying that only a part cash payment could be made. The balance, the buyer would say, could not be paid until a week or two later and would be represented by notes The sight of the busy looking garage generally served to allay suspicion. Then, after the car was delivered it would be sold for about half its value and the dealer's only remedy appeared to be a civil suit on the notes.

Tire dealers, for instance, were shown the car-filled garages and readily furnished supplies, as did accessory men. All the goods were sold at reduced prices. Each transaction, of itself, was so technically legal that it was necessary for the association [illegible] fraudulent intent by linking a han, Empire Tire Co., and Claude Pinney, Advance Rubber Co. Moos, Prince & Nathan are the association's counsel and are directing the legal end of the work. Detective Sergeant Talt has been detailed by Deputy Commissioner of Police Dougherty to assist.

Some of the losses sustained are: Kissel company, $5,000; Goodyear Tire & Rubber Co., $1,000; Century Tire Co., $800; Stein Laplock Tire Co., $700; Empire Tire Co., $600; Central Tire & Supply Co., $500; Akron Tire Co., $400; Brooklyn Tire & Auto Supply Co., $800; Abbott-Detroit Motor Co., $900. Indictments by the grand jury are expected, as are additional arrests.

New York Offices for "U.S.-Maxwell."

For their New York offices, the reorganizers of the United States Motor Co., which is to be renamed the Maxwell Motor Co., have leased extensive quarters in the United States Rubber Building at 57th street and Broadway. The main office, as already is known, will be located in Detroit. The building on West 62nd street, New York, previously occupied by the United States Motor Co., and in which it holds an equity of $100,000, shortly will be offered for sale. It has been appraised at about $600,000.

Oil Company Gets Judgment but no Money.

When the Borne-Scrymser Co., of New York City, sought to collect a bill for about $100 from the Progress Auto Storage & Supply Co., of 209 West 96th street, the same city, it received the information that the business had been turned over to the Progress Garage and the latter declined to pay any of the old company's bills. The oil company thereupon sued, and this week filed judgment in the New York county clerk's office for $106.31 against the Progress Auto & Storage Co.

More Money for Gurney Ball Bearings.

The Gurney Ball Bearing Co. of Jamestown, N. Y., has increased its capital stock from $120,000 to $200,000. Although comparatively little known to the trade at large, the Gurney company, of which S. Winsor Baker is general manager, has developed special machinery which has permitted the production of ball bearings of an impres-

FOSTER M. A. M. PRESIDENT; NEW MEN IN DIRECTORATE

Ohioan Elected to Lead Accessory Manufacturers' Association—Three Veterans Retire—Strong Box Now Contains $100,000.

J. H. Foster, of the Hydraulic Pressed Steel Co. of Cleveland, O., was elevated to the presidency of the Motor & Accessory Manufacturers, Inc., at the annual meeting of the directors in New York on Thursday last, 16th inst. Foster, who previously was first vice-president of the organization, succeeded Harry T. Dunn, who retired after two years of useful service.

To fill the first vice-presidency, the directors chose one of the newest members of their circle, F. Hallett Lovell, Jr., of the Lovell-McConnell Mfg. C. of Newark, N. J. The other officers elected are: C. E. Whitney, of the Whitney Mfg. Co., Hartford, Conn., second vice-president; F. C. Billings, Billings & Spencer Co., Hartford, third vice-president; L. M. Wainwirght, Diamond Chain & Mfg. Co., Indianapolis, treasurer; Alfred P. Sloan, Hyatt Roller Bearing Co., Detroit, secretary and assistant treasurer.

Previously, Whitney was third vice-president and Wainwright secretary and assistant treasurer. The third vice-presidency had been filled by Claire L. Barnes and the treasurership by H. W. Chapin of the Brown-Lipe Gear Co.

At the general meeting of the M. A. M. the day before, when the reports of the retiring officers also were presented, three directors for the three-year term were chosen, as follows: C. E. Thompson, of the Electric Welding Products Co; Alfred P. Sloan, F. Hallett Lovell, Jr., and C. E. Whitney. They succeed D. J. Post, of the Veeder Mfg. Co.; H. H. Chapin, Brown-Lipe Gear Co.; C. T. Byrne, of Byrne, Kingston & Co., and C. E. Whitney, of the Whitney Mfg. Co. The directors who hold over are Messrs. Foster, Duns, Billings and Wainwright, and E. Raymond, E. S. Fretz, W. H. Crosby and T. J. Wetzel.

During the year the membership increased from 151 to 263, and its surplus from $80,000 to $100,000 in round figures.

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In the RETAIL WORLD

S. H. Arnold is about to build a garage in San Diego, Cal., at 645 30th street; the cost will be $5,000.

The Dillon-Goodwin Co. has opened up in San Francisco, at 345 Van Ness avenue; Moon cars will be handled.

Walter Hillier has opened a garage in Davenport, Ia., at Broadway and 6th street; he will feature repairing and vulcanizing.

Seymour Barr, of the Scott County (Ia.) Mercantile Co., has become a dealer; he has the Paige-Detroit agency for Scott county in Iowa and Rock Island and Mercer counties in Illinois. Headquarters are in Davenport, Ia.

Dwight I. Holmes and Arthur A. Lee have opened salesrooms in Los Angeles at 1231 South Flower street, where they will market Lancia cars and Speedwell trucks. Lee formerly was connected with the Mercer and Simplex agency.

The Holsman Sales Co., which recently was organized in Des Moines, Ia., has taken temporary quarters at 919 Locust street; the company has the Iowa agency for King cars; the president of the company is J. A. Holsman, formerly connected with the United Motor Des Moines Co.

Charles S. Marshall, for several years connected with the Minneapolis, Minn., branch of the United States Tire Co., has branched out for himself; he has established the Marshall-Racine Rubber Co., at 911 First avenue, south, and will handle the Northwestern distribution of Kelly-Racine tires.

H. C. McVey, former distributer of Little and Chevrolet cars in Indianapolis, having been assigned duties at the Chevrolet factory in Detroit, has been succeeded by the Salyers-Small Co. The latter comprises A. W. Salyers, former Buick commercial car representative in Indianapolis, and William Small, former Buick dealer in Marion, in the same State.

The Baltimore branch of the Franklin Automobile Co., of Syracuse, N. Y., has been taken over by W. F. Kneip, who will conduct it on a dealership basis; for six months Kneip has been associated with E. F. Williams in the Franklin Motor Car Co., of Kansas City, Mo. Prior to entering the retail trade Kneip was commercial car engineer at the factory.

A. R. Warner, J. Gross Beaver and I. D. Hawbecker have formed a co-partnership in Waynesboro, Pa., and will operate on South Patomac avenue under the style Patomac Garage; the firm expects to open up April 1. Warner is a contractor, while the other two are connected with the electrical department of the Landis Tool Co. Beaver will be general manager of the new business.

To handle the agency business of the Spokane (Wash.) Taxicab Co., the Spokane Taxicab Sales Co. has been incorporated with a capitaliation of $10,000; the officers are: President, Walter J. Nichols; vice-president, F. H. McCollough; secretary-treasurer, Lester P. Edge; general manager, G. E. Riegel. These and B. C. Riblet were the incorporators. Detroiter cars are handled.

E. Ross Davis, manager of the Davis Auto Co., of Little Rock, Ark., is forming an owners' corporation to be known as the United Motor Car Co. It will sell and repair cars; owners only will be stockholders, and it is designed that in this way the bills of those who possess cars will be lowered. Six per cent. interest with a division of two-thirds of the net profits anually is planned.

The Motor Vehicle Sales Co., a recent entry into the trade in Kalamazoo, Mich., is about to open salesrooms at 135-7 Farmers avenue. The concern comprises C. C. Dougherty, of Three Rivers, president; H. A. Worthington, of Kalamazoo, secretary and treasurer, and B. O. McElroy, also of Kalamazoo, sales manager. The company has purchased the Buick agency of David Reid and has as territory Kalamazoo and three other Southwestern Michigan counties.

Gus H. Grieger, formerly a member of the Indiana General Assembly from Laporte and Porter counties, is about to enter the automobile trade, his term as a legislator having expired. He has associated with E. H. Steinhart of the Cadillac Auto Co. of Indiana, located in Indianapolis, and the Cadillac Auto Co. of South Bend, a subsidiary concern. The new company's capitalization is $10,000. Grieger formerly resided in Hanna but will remove to South Bend.

The retail sales and service business of the Western Motor Car Co., of 10th and Hope streets, Los Angeles, has been turned over to a new concern, the Chalmers-Los Angeles Co. The latter occupies the premises on Olive street which were occupied by the Western company until recently; the Western company will handle wholesale trade exclusively. A. C. Lusby, for several years with the Western company, will manage the retail business; J. D. Fenton has charge of the service.

W. L. Tedford, principal owner of the Tedford Auto Co., of Little Rock, Ark., has given up all but the new car sales part of the business; he handles the Overland. The repair division of the company has been sold to F. L. Butler, the former foreman, who has styled it the Butler Repair Co. Accessories were taken over by J. B. Pearson, treasurer of the Tedford company, and will be styled Motor Car Supply Co. All three companies will remain at the present location on 9th street and Tedford will store his cars in the garage.

The entry of the Flanders Motor Co. into the reorganized United States Motor Co. will result in the amalgamation of the Landman-Griffith Motor Co., distributers of Flanders products in and about Toledo, O., and the W. H. McIntyre Co., which handles the United States company's cars in the same territory; members of the new company will be Charles P. Landman, W. E. Griffith and W. H. McIntyre, and the new incorporation will be styled the Landman-Griffith-McIntyre Co. The new concern will locate at Madison avenue and 14th street.

The Pan-American Motors Co., of San Francisco, has taken over the newly formed Inter-State Motors Co. and will remove to the latter's place of business on Golden Gate avenue, near Jones street; the line now consists of Dayton and Piggins trucks and Inter-State and Great Western cars, the three latter having been handled by the Inter-State Motors Co., and furnishing a reason for the combine, since the Pan-American wished to add pleasure cars to its line. In the Pan-American there is little change; C. T. Hyland remains president, Captain F. W. Cole vice-president and general manager, and W. A. Baxter, sales manager. A. McLaughlin, of the Inter-State, has joined the sales department of the new business.

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WALPOLE TIRE PREFERRED STOCK OFFERED TO PUBLIC

Revenue To Be Used to Increase Volume of Tire Business—Business Triples in Five Years—Statement of Condition.

With additions to its plant in Walpole, Mass., under way which will permit of an output of 1,900 tires per day, the Walpole Tire & Rubber Co., which recently transferred its charter from Maine to Massachusetts, is offering for public subscription its new issue of 7 per cent. cumulative preferred stock; its authorized capital is $4,500,000, of which $3,000,000 is represented by preferred shares and $1,500,000 by common. All save $1,000,000 of the preferred is outstanding.

The present sale of preferred stock is designed to provide for the needs of the tire department, which was instituted about a year ago. Previous thereto the company had been producing a variety of other rubber goods. It claims to be the largest producer in the world of rubber heels and insulating tape.

According to its prospectus, a conservative valuation of the company's property in Walpole, Mass., and Granby, Quebec, exceeds $1,000,000. Its business has increased annually, having grown from $496,901 in 1907 to $1,508,911 in 1911, the greatest increase, however, appearing last year, when with the months of November and December estimated, its gross business amounted to $2,518,725. In that year its net profits aggregated $325,000, on which were paid preferred dividends amounting to $157,229, leaving a surplus of $167,771. With the last two months estimated, the condition of the Walpole company at the end of the year was as follows:

Resources.

Real estate and buildings	$545,466.66
Machinery	587,945.57
Water power and equipment	53,482.35
Merchandise inventory	959,431.10
Accounts receivable	566,957.10
Notes receivable	22,922.18
Cash	122,815.22
Stock owned	755,620.25
Laboratory equipment and patents	750,000.00

There is no bonded or mortgage indebtedness on the Walpole property, nor can any such mortgage be placed without the consent of 75 per cent. of preferred shareholders.

Dividends on the preferred stock have been paid quarterly and for nearly three years dividends, at the rate of 4 per cent., regularly have been distributed to the common stockholders.

The new issue of preferred stock which is being offered to the public is of $100 par value and is redeemable at 120.

Minor Business Troubles.

The Hawley Motor Co., of Quakertown, Pa., has been adjudicated a bankrupt; Oscar O. Bean was named referee by the Federal court in Philadelphia.

The filing of schedules in bankruptcy by the Bates-Odenbrett Automobile Co., of Milwaukee, Wis., against which a petition was filed three weeks ago, discloses the fact that cash in hand amounts to but ten cents; other items are: Taxes due, $532.90; bills payable, $849.63, and debts due, $3,846.

Creditors have filed a petition in bankruptcy against J. J. Behan and S. Frank Behan, who have traded at 702 North King's Highway, St. Louis, Mo., under the style Behan Automobile Equipment Co. They are unincorporated. The six petitioners and their claims, totaling $533.17, are: Diamond Rubber Co., $193.06; J. H. Sager Co., $144; Stewart & Clark Mfg. Co., $24.12; United Rim Co., $25.74; Goodyear Tire & Rubber Co., $46.25, and B. F. Goodrich Co., $100.

Claims Treasurer Was Loaned Money

How much Clifford M. Bouggy borrowed of the Speedwell Motor Truck & Service Co., of 205-13 West 36th street, New York City, between January 11 and August 25, 1912, while he was acting as treasurer of the company, is a matter in dispute in an action which was filed last week against him in the Supreme Court for New York county by the Speedwell company. It claims he borrowed $1,122.50 and paid back but $256.21, leaving a balance of $866.29, which amount is asked. He admits paying back $256.21 and denies he owes any more, and his only other admission of consequence is that he refused to pay the additional sum which is demanded.

PROMINENT MEN IN TRADE WHO ASSUME NEW DUTIES

Resignations and Promotions That Serve To Place Many Workers In New Places—Few Leave the Industry.

Charles Drum has been appointed production manager for the Keeton Motor Co. of Detroit, Mich. Previously he was connected with the Packard Motor Car Co.

Max Wollering has returned to the Studebaker Corporation in the capacity of production manager of the Detroit plant. He left the company about two years ago to become superintendent of the Flanders Mfg Co. in Pontiac, Mich.

W. W. Austin, who for several years served as factory manager of the Garford Co. in Elyria, O., has resigned that position, after an association of 15 years with the various Garford interests. His plans for the future have not yet been made.

Charles A. Trask has resigned as factory manager of the Henderson Motor Car Co. of Indianapolis to join the Nordyke & Marmon staff. The vacancy caused by his resignation has been filled by the appointment of J. M. Smith, former factory manager of the Cole Motor Car Co.

John A. Nichols, Jr., has been appointed northeastern manager for the Franklin Automobile Co. of Syracuse, N. Y. During the past year, Nichols has been a Franklin dealer in North Yakima, Wash., but previously was connected with the Franklin company itself, first in its advertising department and later as superintendent of branches. Seattle will be his headquarters.

C. W. Stratford has been appointed chief engineer of the International Motor Co. of New York, maker of Saurer, Mack and Hewitt trucks. He succeeds E. R. Hewitt, who resigned about two months since.

R. K. Davis has been appointed sales manager of the Penn Spring Co. of Baldwinsville, N. Y. He, however, will make his headquarters in the Majestic Building in Detroit. Previously Davis was manager of the United Motor Detroit Co.

J. L. Wellington, one of the former vice-presidents of the United States Motor Co.

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Contributions concerning any subject of automobile interest are invited and, if adequate, will be paid for; or, if unavailable, will be returned provided they are accompanied by return postage.

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NEW YORK, JANUARY 23, 1913

STANDARD OIL AND OTHER PUBLICITY.

It is regrettable that none of the several trade associations which convened in New York last week took any action in respect to what has come to be known as the gasolene situation. It is a subject which strikes at their very vitals, and action by any or all of these organizations would strike a popular chord and convey to dealers and owners that the associations have an eye for more than the interests of the manufacturers alone.

However that may be, goading from many other directions has caused the Standard Oil Co.'s press bureau to undertake a defense of its action in advancing the price of gasolene 90 per cent. in the course of little more than a twelvemonth. The defense was given great prominence in the reading columns of practically all of the leading daily newspapers, but, despite the profound language and masses of figures which are brought to bear, the defense simply resolves itself into the "supply and demand" excuse which is repeated parrotlike in Standard Oil circles whenever inquiry is made or the subject is broached.

No attempt is made to explain the discrimination which prevailed in different parts of the country, which amounted in some instances to as much as four cents per gallon; and, as a matter of course, the Standard Oil employe who is made to appear its spokesman dares not comment on the great, glaring fact that, despite the much-mooted decrease of supply, Standard Oil profits on an abnormal capitalization continue to grow at an equally abnormal ratio. That one fact will stand against any defense which Standard Oil ever may undertake and will give the lie to any excuse with which it may seek to fool the public. It makes clear that Standard Oil, like nearly all other huge corporations, is not inclined to play fair with the public and that its every effort is bent toward the increase of its always enormous earnings.

The fact that the big corporation's publicity bureau now is employing the public prints in an effort to throw dust in the public eye suggests many things, but nothing so strongly as the extent to which the means of obtaining publicity have been developed and the ends which it may be made to serve, which in turn suggests that the responsibilities of those who have to do with public prints have been enormously increased.

The big corporation, the stock jobber, the get-rich-quick men and every other type of promoter and speculator is aware how easily publicity without cost is now obtainable and much devilish ingenuity is being exercised in the effort to obtain it and thereby favorably impress the public. Indeed, press-agentry has become such a fine art that the publication which does not exercise keen discretion and which is easily overpowered by the influence of its advertising department is likely to be made a tool of selfish interests whose chief aim is plucking the public, instead of remaining the advocate and defender of the public.

It is regrettable that the press agent, and the advertisement which is supposed to lie back of him, have been permitted to become so potent in the offices of so many supposedly powerful publications.

INCREASING DEPTH OF UPHOLSTERY.

Although the gradually deepening seat cushions which form one of the very prominent features of nearly all of the cars in the newer crop can be condoned, if not lauded, as a well-directed step to increase the comfort of passengers, it would seem that there is a logical limit to the increase in thickness and that the limit is not, as might be supposed, the floorboards of the car. In other words, the limit of thickness might be expressed in terms of durability. At any rate, the length, or rather the depth to which the thickening has been carried in some instances suggests a problem in which luxury and ability to withstand hard wear appear as factors of no little prominence.

Quite naturally, thick cushions can be expected to make for easier riding and greater bodily comfort than can thin cushions, provided, of course, that the thick ones are as resilient as their dimensions suggest them to be. But, on the other hand, a degree of resiliency presupposes a corresponding degree of vertical movement, which, in turn, results in an increase in wear which may be expected to reduce the natural life of the upholstery to an extent depending upon the quality of the materials and other influencing factors, such, for instance, as friction, both internal and external.

Hence, the limit of thickness becomes apparent and should be governed as much by durability as by luxury if the mental and financial as well as the physical comfort of the owner is to be catered to.

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January 20-25, Philadelphia, Pa.—Philadelphia Automobile Trade Association's exhibit in the garage of the Automobile Club of Philadelphia.

January 20-25, New York, N. Y.—Automobile Board of Trade's 13th annual show in Madison Square Garden and Grand Central Palace. Commercial vehicles only.

January 21-26, Toledo, Ohio — Annual show in the Exposition building under the auspices of the Toledo Automobile Shows Co.

January 25-February 1, Montreal, Can.—Show in the Drill Hall under the auspices of R. M. Jaffray.

January 25-February 1, Providence, R. I.—Annual show of the Rhode Island Automobile Dealers' Association in the Providence State Armory.

January 27-February 1, Waterbury, Conn.—Waterbury Automobile Dealers' Association's second annual show in the Auditorium.

January 27-February 1, Ottawa, Can.—Annual show of the Ottawa Valley Motor Car Association in Howick Hall.

January 27-February 1, Detroit, Mich.—Detroit Automobile Dealers' Association's Show in the State Armory.

January 27-February 1, Philadelphia, Pa.—Philadelphia Automobile Trade Association's exhibit in the garage building of the Automobile Club of Philadelphia. Commercial vehicles only.

January 27-February 1, Rochester, N. Y.—Fifth annual show of the Rochester Automobile Dealers' Association in Exposition Park.

January 27-February 1, Rochester, N. Y.—Rochester Automobile Dealers' Association's fifth annual show in Exposition Park.

January 27-February 1, Buffalo, N. Y.—Buffalo Automobile Dealers' Association's eleventh annual show in the Broadway Auditorium. Pleasure cars only.

January 27-February 1, Scranton, Pa.—

February 3-8, Washington, D. C.—Washington Automobile Show Co.'s exhibit in Convention Hall.

February 8-15, St. John, N. B.—First annual show of the New Brunswick Automobile Association in the Drill Hall.

February 8-15, Youngstown, Ohio—Annual show of the Youngstown Automobile Show Co. in the Auditorium and Annex.

February 8-15, Hartford, Conn.—Sixth annual show of the Hartford Automobile Dealers' Association in the State Armory.

February 10-15, Minneapolis, Minn.—Minneapoils Automobile Show Co.'s show in the National Guard Armory.

February 10-15, Chicago, Ill.—National Association of Automobile Manufacturers' 12th annual show in the Coliseum and 1st Regiment Armory. Commercial vehicles only.

February 12-15, Geneva, N. Y.—Annual show in the State Armory, under the auspices of the Ottawa Valley Motor Car Association.

February 15-22, Albany, N. Y.—Annual show of the Albany Automobile Dealers' Association in the State Armory.

February 15-22, Newark, N. J.—New Jersey Exhibition Co.'s Sixth annual exhibit in the First Regiment Armory.

February 16-23, Richmond, Va.—Richmond Automobile Dealers' Shows Co.'s exhibit in the Horse Show building.

February 17-27, Kansas City, Mo.—Kansas City Automobile Dealers' Association's show in Convention Hall. First week pleasure cars; second week commercial vehicles.

February 19-22, Davenport, Ia.—Annual show of the Tri-City Automobile Dealers' Association in the Coliseum.

February 19-22, Oshkosh, Wis.—Oshkosh Automobile Dealers' Association's second annual show in Armory B.

February 20-22, Canandaigua, N. Y.—Motor Car show in Hawley's Garage, under the management of A. Blumenstein.

February 22-March 1, Brooklyn, N. Y.—Brooklyn Motor Dealers' Association's third annual show in the 23rd Regiment Armory.

February 24-March 1, Omaha, Neb.—Omaha Autmobile Dealers' Association's

March 1-8, Paterson, N. J.—Second annual show of the Paterson Automobile Dealers' Association.

March 3-8, Pittsburgh, Pa.—Pittsburgh Automobile Dealers' Association's show in Duquesne Garden.

March 3-15, Des Moines, Ia.—Des Moines Automobile Dealers' Association's fourth annual show in the Coliseum. First week pleasure cars; second week trucks.

March 8-15, Boston, Mass.—Boston Automobile Dealers' Association's annual show in Mechanics' Hall. Pleasure cars only.

March 10-15, Dallas, Tex.—Annual show of the Dallas Automobile Dealers' Association in the Fair Grounds Coliseum.

March 19-25, Boston, Mass.—Boston Commercial Vehicle Association's annual show in Mechanics' Hall.

March 20-24, New Orleans, La.—Annual show of the New Orleans Automobile Dealers' Association.

Buick Reports Twelve Million Assets.

According to its annual statement, filed with the Secretary of State of Michigan on December 10th, the Buick Motor Co., of Flint, possesses assets amounting to $12,271,200, which represents an increase of $1,164,596. Its liabilities on the same date, exclusive of its surplus, totalled $5,676,882. Its surplus account, of course, figures as a liability—$6,594,318, an increase of $90,628. The details of the several items are as follows:

	1912.	Increase
Assets—		
Merchandise	$4,581,629	$298,029
Cash and debts receivable	2,814,865	47,150
Investments	1,821,324	*1,219,760
Other assets	3,053,382	2,039,168
Total	$12,271,200	$1,164,596
Liabilities—		
Capital stock	2,500,000	
Accounts payable	1,430,915	760,077
Other indebtedness	1,745,967	313,891
Surplus	6,594,318	90,628
Total	$12,271,200	$1,164,596

Willys Contributes $150,000 for Highway.

John N. Willys has added his weight and $150,000 of his money to the trans-continental road projected by Carl Fischer and J. A. Allison of Indianapolis. Willys made his contribution while in New York one day last week. It is to be paid in three yearly installments of $50,000 each.

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CAR INSURANCE RATES CUT 10 TO 30% FOR FIRST YEAR

New Schedule Effective February 1 Lessens Cost of Insuring New Cars—Second Year Rates Higher—Changes as Planned.

On February 1 there will become effective with practically all fire insurance companies in the East a schedule of automobile insurance rates which is considerably lower in certain respects than that which now prevails, the new schedule having been adopted last week at a meeting of the Automobile Underwriters' Conference, in New York City, and proving very much a surprise in that no inkling of the proposed revision had reached even many well-informed insurance brokers.

The rates as revised will be followed by all those companies which insure cars, with one or two exceptions, and are said to have been compelled to forestall competition in the car insurance line, which is looming up before the established insurance companies in the form of new corporations formed for this particular line of business The principal change is effected by the creation of two separate classes to replace the one at present in use—one for new cars in their first year of service and the other for cars which are being used a second year by the same owner, or used cars which are being used in either their first or second year of service. For used cars of greater service the actual value is taken into consideration, but for the first named the original list price is the basis of estimate. The figures disclose a lot of that fine hair-splitting peculiar to the insurance business.

Class No. 1 of the new rates is from about 10 to 28 or 30 per cent. lower than the old one-class rate classification. The tables are divided into twelve divisions, according to value, the lowest being $700, whereas the old table ran one division lower—namely, $500 to $699. Also the new Class 1 table does not permit so small an insurance as heretofore, for instance, where a $6,500 car previously might carry as low as $2,000, it will be able to take not less than $3,000 under the new rates. The changes vary and the amounts of insurance now run from $500 to $6,500 and up in 19 divisions, where previously there have been 18 graded from $400 to $6,500 and up.

Class No. 2 is graded as the same as the class which formerly was the only one in use, except the $500-$699 valuation has been dropped, but the rates have been slightly raised; on cars costing from $3,500 to $6,500 and up there is no change, but on cars listed between $1,500 and $3,500 there has been an increase of about 10 per cent., and on the $700-$1,500 class there are raises of from 9 to 13.6 per cent. To illustrate:

Under the old, or present, rules a car costing $2,500 could carry $2,500 of insurance for the first and second years for 2½ per cent., or $62.50. Under the new rules it can carry $2,500 the first year for 2 per cent., or $50—a reduction of 20 per cent. For the second year, under the new rules, it may carry this same amount of insurance at a rate of 2¾ per cent., or $68.75, an increase of 10 per cent.

Slightly different than under the old rules, if an owner desires to accept a policy in which the value of his car is not predetermined and in which the theft clause is not incorporated, he may secure a reduction of ⅛ per cent. on cars in Class No. 1 and ¼ per cent. on cars in Class No. 2. The old reduction was ¼ per cent. for the elimination of the non-value clause for all cars and ⅓ per cent. for the dropping of the theft paragraph on first year cars and ¼ per cent. on all other cars.

Several flat rates are included, as follows: Class No. 1, 2¾ per cent. for cars under $700, with a minimum premium of $12.50; Class No. 2, 3¼ per cent., with the same minimum of $12.50; electric cars, 1½ per cent., with reductions of ⅛ per cent. for the elimination of theft and value clauses. Commercial cars fall within Class No. 2.

Claims Five Tire Treads Are "Unfair."

Despite the fact that its application for a patent was not pressed to issue, the Batavia Rubber Co., of Batavia, N. Y., manufacturer of the "Security" tread, has inaugurated a movement to prevent general use of its design. Thus far the company has not gone into court, but last week served notice upon five tire makers, advising them that they were using imitations of the "Security" tread and that the Batavia company would wait a reasonable length of time for notification that the manufacturers notified will "cease further infringement." Action will be taken under the "Unfair Competition" law.

The companies notified are the Seamless Rubber Co., New Haven, Conn., maker of the "Safety" tread; Kelly-Racine Rubber Co., Racine, Wis.; United & Globe Rubber Cos., Trenton, N. J.; Stein Laplock Tire Co., New York City, and the C. H. Stoddard Rubber Tire Works, of Worcester, Mass. The notification states that the imitated treads tend to deceive the public and that the manufacturers "will be held accountable for any damages which the Batavia Rubber Co. may sustain because of unlawful infringement." The "Security" tread, which has been employed for several years, consists of depressions in the tread at each side of the center, in appearance like cuts.

S. A. E. BANQUET ASSUMES UNEXPECTED PROPORTIONS

Ballroom of New York's Newest Hotel Too Small and 25 Floors Separate Diners—Clever Skits in Print.

Almost, but not quite, drawing to a close the winter meeting of the Society of Automobile Engineers, the ninth annual dinner, which was held on Friday night, 17th inst., in New York's newest hotel—the McAlpin—proved all that its sponsors hoped it would prove, and more. Altogether, some 400 members and guests were seated, and not even the fact that the unprecedented demand for tickets caused a slight alteration of the original plans, which provided seats for all in the grand ballroom on the 24th floor, and necessitated that 20 tables be ranged 25 floors lower down, in the Grill Room, prevented the dinner from being a great big "get together" that afforded an opportunity for much jollification and a general renewal of acquaintance.

The principal section of the dinner was in the ballroom, of course, where the Council was seated at the first table. Although the first table nominally is styled the speakers' table, the designation scarcely was a good fit, for the few words that were spoken hardly could be called speeches. Howard Marmon, of Nordyke & Marmon Co., Indianapolis, Ind., newly elected president of the society, addressed the meeting very briefly and, after praising the work that has been done in past years, outlined the objects to be attained in the future. Professor F. R. Hutton and the retiring president, H. W. Alden, also addressed the gathering very briefly, both of their speeches, if they may be termed such, being tinged with the humor that everywhere was apparent.

Despite the separation that placed upward of 150 members and guests below the street level, it had no appreciable effect on their good spirits, as was evidenced by concerted efforts to out-sing a troupe of colored cabaretists and to have a good time in general, though it was not an altogether quiet one. Upstairs, where the newly elected officers were seated, jubilation was only slightly less apparent, and at both sections laughter loud and long followed the distribution of the latest issue of the S. A. E. BULLetin, a more than ordinarily clever skit on the bona fide bulletins issued monthly by the society, that was delivered to members and guests with the printed instructions that it was "loaned by the entertainment committee."

As for the dinner itself, it was a fearful and wonderful affair, according to the Eng-

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lish meaning given to the names of the dishes as they appeared on the menu in French and even though menus, as a rule, are uninteresting, except to those who translate them with the ultimate object of satisfying their appetites or their curiosity, the entertainment committee evidently had little difficulty in making this particular menu instructive as well as interesting. Under the caption, "An explanation of what you have eaten," the various courses were described in the BULLetin as follows:

Hors D'Oeuvres Varies — Otherwise known as delicatessen with an expensive name.

Huitres — Bivalves-poppet—Smooth-sliding and some rotating, otherwise called oysters, generally scarce in a New York stew.

Veloutte Fanchonette—Soup made by a Frenchman and eaten by an engineer. (All that the name implies.)

Paupiette de Bass—Part of a fish. (Ask the man who owns one.)

Ris de Veau Sapho—Never mind the first, the last sounds reasonable. (We guarantee the service.)

Poussin de Hambourg—Perrigourdine—Ordinary stockyard meat. The Q is silent as in billiards.

Bombe Gismonda—Sounds like starting a Pierce.

Petits Fours—The sixes have been neglected.

Cocktails—(A little goes a long way and every drop counts).

Champagne a la Carte—See the accessory salesmen.

Among other things equally entertaining, including a number of really clever cartoons of men prominent in the trade, one of which depicted Henry Ford smilingly watch Ford "birds" hatch and fly off to England, with John Bull standing on the shore "shooing" them off, the BULLetin contained "advertisements" quite as a matter of course. And even though the "ads" were fictitious, that the humor displayed in them was subtle in more than one respect may be judged by the quarter page "announcement" of "W Flounders"

I will start you in Business

Build a big factory for you and tell you how and where to sell it

Room section repaired to the Ballroom, where the tables were cleared away and the engineers, were entertained in a body by a vaudeville show of six numbers that was "tailed off" by the "Farber Sisters—Just Out of a Show Limousine," who had no difficulty in extracting the square root of four with a slide rule, but who balked at extracting the cube root of Moscovic's nerve with the same instrument.

Those who were seated at the Council table were Howard Marmon, H. W. Alden, Robert McA. Lloyd, Howard Coffin, Henry Souther, E. T. Birdsall and Prof. F. R. Hutton. The first table was occupied by Secretary Coker Clarkson, A. B. Cumner, Merle L. Downs, A. L. McMurtry, H. C. Wilson and Axel Ames.

Two Injunctions for Weed Chain.

Although the W. E. Pruden Hardware Co., of 864 Eighth avenue, New York City, promised to "be good" when the Weed Chain Tire Grip Co. sued it two years ago for alleged infringement of the Parsons patent, No. 723,299, and persuaded the Weed people to withdraw the action, the hardware concern seems not to have kept within the straight and narrow path, for Friday last, 17th inst., the Weed company, in the United States District Court for the Southern District of New York, sued again and was given an injunction against the Pruden company; the order restrains it from selling cross chains and other parts, not licensed under the Parsons grant.

On the same day the District Court issued an order in the suit of the Weed company against the Q. D. Hook Co., Edwin S. Holmes, Jr., Randoph T. Warwick and others, enjoining them from manufacturing the Q. D. cross chain, cross chain hook and other parts, adapted and intended for the repair of chain grips. The Q. D. company is said to have been organized in Washington, D. C., for the purpose of manufacturing and marketing these parts under a patent granted to Edwin S. Holmes, Jr. The Q. D. company exhibited its goods in Grand Central Palace during the opening days of the present New York show.

"35%" Scores Point on Pedal Maker.

Despite the fact that the Personalty Liquidating Co. was victorious in its suit against the 35% Automobile Supply Co. in claimed came within the scope of payment on one of the latter's now famed advertising contracts. The Pedal company, however, claimed the goods, the value of which was the basis of the suit, were extraneous to the contract.

Unusual Turn to Used Car Transaction.

The used car problem has assumed for L. M. Rosenthal, a New York shoe merchant, an angle which is rather unusual, but he has secured a decision in the New York City Court which causes him to be fairly well satisfied with the problem's solution. His trouble began when he took a used Knox car to the Rodney K. Haines Co., a metropolitan used car concern, and asked that it be sold for him. The Haines company alleged that it did not take the car in to sell, but actually bought it, giving therefor a Marquette car and getting certain money "to boot." When the car was not sold Rosenthal demanded its return, and the suit resulted in an order to the Haines company to return to him his car or else pay him $500. Rosenthal is equally well satisfied either way. Also, the Haines people must pay the costs of the action, which amount to $118.93.

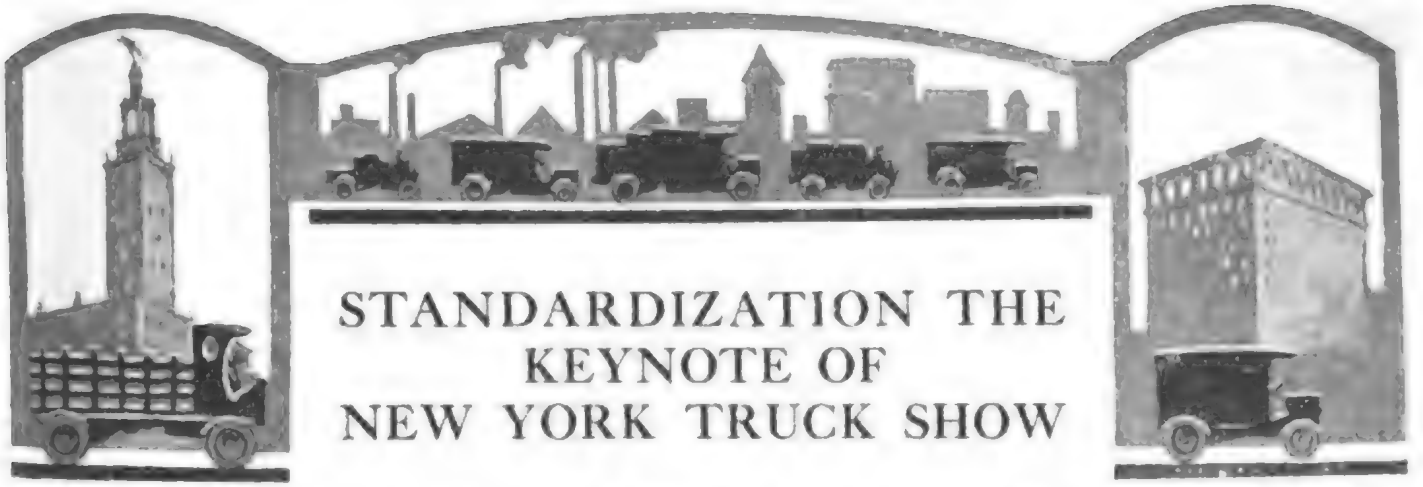
Dyer Settles with Six Defendants.

Six suits against alleged infringers of the Dyer transmission patents, Nos. 835,986 and 921,963, instituted in the United States District Court for the Southern District of New York by the Enterprize Atuomobile Co., holder of the Dyer patent, were discontinued this week, after having been practically ended by settlement several weeks ago; the defendants were the Palmer & Singer Mfg. Co., Ducasse & Co., C. A. Glentworth, Washington Garage Co., and two taxicab men named Comiskey and Cooper, all of New York City.

Trumbull Enters Hartford Auto Parts.

John H. Trumbull, president of the Trumbull Electric Co. of Plainville, Conn., was elected a director of the Hartford Auto Parts Co. of Hartford, Conn., at its annual meeting last week. He succeeds Thomas H. Brady, of New Britain. The directors re-elected are as follows: William H. Cadwell, Dr. J. J. Andzulatis and Charles Mueller of New Britain, and Andrew J. Brougher of Hartford.

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STANDARDIZATION THE KEYNOTE OF NEW YORK TRUCK SHOW

Vehicles Disclose No Lack of Individuality But Trend Toward Certain Standards Is Plain—Notable Developments in Tractors, Dumping Mechanisms and Removable Units—Worm Drive Gains—Several Surprises.

Few of the nearly 200,000 persons who last week visited Madison Square Garden and Grand Central Palace to view the Automobile Board of Trade's display of pleasure cars and accessories witnessed the real "action" of the show; for the "action" occurred between 11 o'clock Saturday night and six o'clock the following Monday evening, 20th inst. There was lots of it, but it was not spectacular "action"; it was too heavy to be spectacular. It was contained in the moving out of the 325 cars and chassis and more than 100 exhibits of accessories, and moving in of 236 trucks and chassis, most of them big fellows, to say nothing of the rapid changes of signs and other appointments.

When the Big Doors Were Thrown Open.

The truck show—Part II, it is officially denominated—was formally inaugurated at eight o'clock Monday evening, but the heavy work had been so well performed that the display contained no suggestion of it to even the most interested visitor. Everything was in spick and span order, and though the effect is not so beautiful to behold as during the previous week, the vehicles on display are really more picturesque. There are big trucks and little wagons, huge dump carts, ambulances, hearses, fire engines and what-not, no two of them appearing alike, at least so far as external appearance is concerned; and though their surroundings—mirrors and white statuary, and crystal chandeliers and rose garlands in Madison Square Garden, and marble columns, lattice work, and poinsettias and scenic paintings in Grand Central Palace—though these surroundings are strange and suggest drawing rooms rather than a setting for dump carts and the like, the dump carts and most of the others care not at all. In fact, few of the spectators appear to notice the incongruity. And there were full houses in both buildings Monday evening, although since that time the numbers have been considerably diminished.

Plenty of Room and Some to Spare.

What most impresses those who witnessed Part I is the great increase of elbow room in Part II. There is more than room enough for all. In fact, in the Palace there are no exhibits whatsoever on the second floor. It is practically in darkness, and the comparatively few accessory exhibitors on the floor above have reason to be unhappy. Not many visitors are aware of their existence and few wend their way upward.

The outgoing of accessory exhibitors in both buildings amounted almost to an exodus. In the Garden, that beehive of industry termed the basement was depopulated, and but for the entry of less than a dozen machine tool exhibitors who occupy a very small part of the "lower region" it would be deserted. In the Palace, as stated, the second floor really has been deserted, and the top floor, previously crowded, is now but a shadow of its former self.

Standardization and No Freaks.

The dominant note of the double show is a note of unity—of getting together—of agreeing upon certain systems and methods that have been tried in former years. There is a mechanical sameness and an amount of repetition that would be monotonous if not relieved by variations in detail. Manufacturers who have settled down to a standard that has been unchanged, except in detail, in years, form a group that is increasing so rapidly that it soon will be difficult to say which is the "group" and which the others. All of which is directly in line with the "prophetic view" taken of the show in the Before Shows number of Motor World, and indicates, not that there is any falling off in the ingenuity of designers, or any lack of originality or initiative, but that the fittest is surviving and the rest is not.

What Makers Had "Up Their Sleeves."

Every show is livened up and "spiced," so to speak, by a few unexpected exhibits that manufacturers keep in the dark until the doors open. The present exhibition is no exception to the rule; it has its "surprises" and, by the same token, the surprise that has been sprung by the Studebaker people amounts almost to a shock. While it has been known for some time that the famous corporation has been quietly working on a gasolene commercial vehicle, the exact character of the design was unknown, and when the uncovering at the Palace revealed a final drive through internal gears and other details to match—and, further, when the gasolene car was flanked by a brand new electric with worm drive direct to the rear axle, the surprise was thorough and complete. And still further, the machines shown are not isolated models; they are merely representative of two complete lines, ranging, in the case of the gas car, from 1 ton to 6 tons, and in the case of the electric from 1 ton to 5 tons carrying capacity.

The gasolene Studebaker is a big, substantial machine in its general make-up, and the framing is particularly well braced by heavy end members and gusset plates. The most conspicuous feature of the machine, however, is its final drive, which is of the internal gear type that is so rapidly gaining

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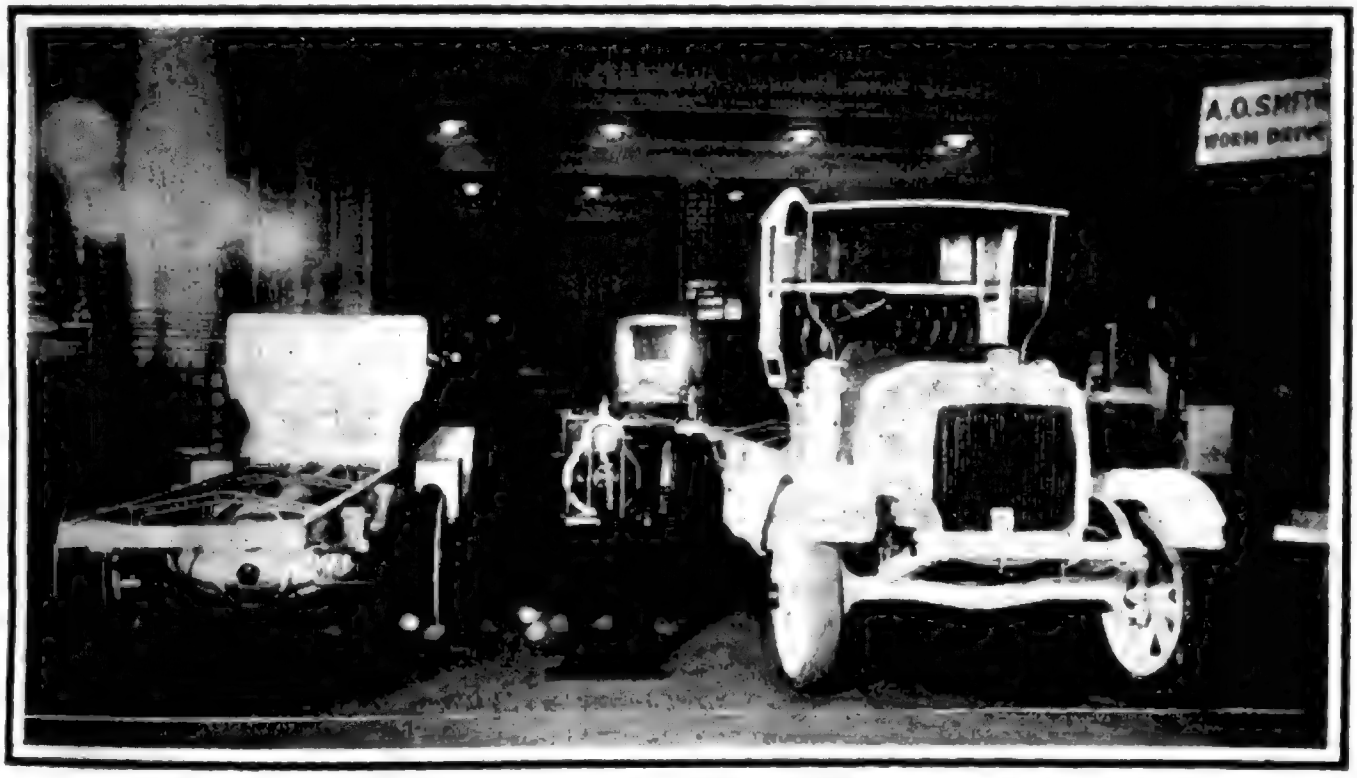
WM. MEYERBACK
PIANOS MOVED

ground for commercial work. There is a live axle bevel-gear driven from the propeller shaft in the usual manner, and driving by means of pinions to internal gears enclosed in housings on the rear wheels; the driving shaft and their housing carry none of the weight of the car, which is supported by a separate "dead" axle of rectangular steel.

Another feature of the car is the clutch, which is designed, among other things, to wear about as long as its services are likely to be required. It is of the internal expanding type, bronze shoes, with grooved bearing surfaces, expanding against the interior of the extended flywheel rim, which is correspondingly grooved. The wear on the metal-to-metal surfaces is said to be extremely slight, in addition to which there is sufficient stock so that there is room for a total wear of ⅜ inch, measuring diametrically. After considerable experimenting with various types of clutches the Studebaker company, it is stated, decided upon this form not only because of its wearing qualities, but because of its extremely smooth working under all conditions.

The gearset has four speeds, selectively controlled, and is separate from the motor. The service brakes are on drums on the rear wheels, and the emergency brakes, on the driving shaft just forward of the bevel gear housing, consists of two bands contracting on a broad drum, actuated by cams which, when partially rotated by the operating rods, force the ends of the bands together. Adjustment for wear is effected by means of a large wing-nut on each brake, turning the nut shortening the distance between the ends. No tools are required and the nuts lock automatically in position.

In the worm driven electric the motor is mounted as a unit with the rear axle, the casings being bolted together, close-coupled, so to speak; the front end of the motor is supported by the converging radius rods, which come together at a cross frame forward of the motor and take the driving stresses. The control lever arrangement savors strongly of gasolene car practice; the emergency brake and controller levers both are in the center, and look much like the brake and gear levers of a gas car. There is an interlocking device whereby the controller lever automatically flies back to neutral if it should be in an "on" position when the emergency is applied, so that a sudden stop may be made with a single movement—a straight pull on the emergency brake lever.



TWO OF THE HEAVIEST VEHICLES IN THE SHOW—SMITH WORM-DRIVEN CHASSIS IN THE PALACE

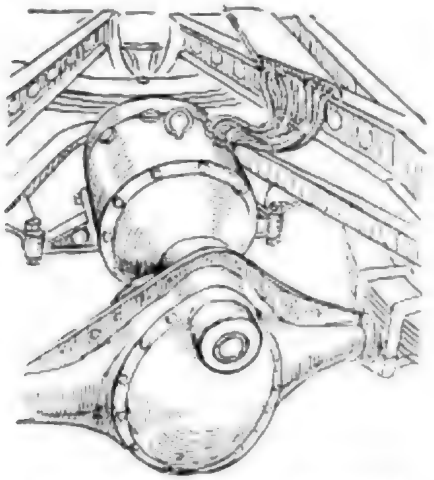
Surprises in the Light Brigade.

There were two other surprises, one of which, to use a Hibernianism, was not unexpected, while the other was quite unlooked for. One is the Buick light parcel wagon, which has been "on the stocks" for some time, but which hardly was expected to be ready for the show and was kept very much out of sight in the meantime; it is distinctive, as a Buick, in that it has an L-head motor, all other members of this family having valves in the cylinder heads. The wholly unexpected machine is the product of the International Motor Co., of New York, which embraces the Hewitt, Saurer and Mack concerns; the new car, a four-cylinder gasolene light wagon of 1,500 pounds capacity, is different from all three of these machines and bears the name International.

The most conspicuous feature of the new Buick, barring its solid and substantial construction, is the careful manner in which the accessibility of parts has been worked out. Thus, for instance, the propeller shaft is enclosed in a heavy torque tube hung at the front end to a cross chassis member in such a way that it quickly and easily is demountable without the necessity for disturbing other units. Similarly the clutch unit and the gearset unit can be lifted out integral almost instanter. The gearset, by the way, provides three forward speeds and reverse, selectively obtained, and the gear shift lever is "let into" the gear box through an ingenious ball and socket joint which precludes the possibility of dirt finding its way into the "works" and at the same time eliminates the necessity for a gate change. Another interesting feature which reveals substantial construction is the manner in which the steering column is braced to the dashboard; it may be used almost as a trapeze by the driver without fear of its derangement.

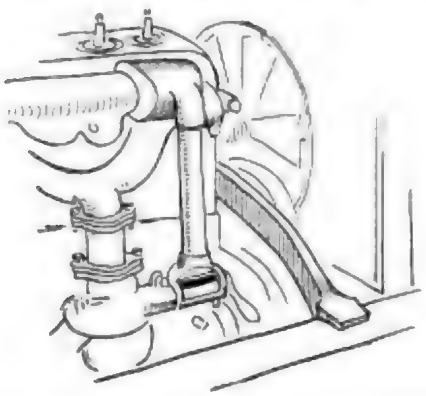
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Not content with any half-way measures in the formal adoption of an L-head motor, Buick engineers have gone even further and have provided probably the maximum of internal accessibility by making the cylinder heads, or rather the cylinder head—for the motor is cast in a single block—detachable. The bore and stroke measure 3 x 5



STUDEBAKER MOTOR SUSPENSION

inches, and though the S. A. E. rating thus is comparatively low, the actual power developed is in the neighborhood of 23 at 1,500 revolutions a minute. A governor is fitted, quite as a matter of course, and though it is of the adjustable variety, once adjusted for the desired speed, it cannot be tampered with without the knowedge of the owner. Conforming to the natural tendency, he steering wheel has been placed at the left side with the control levers in the center

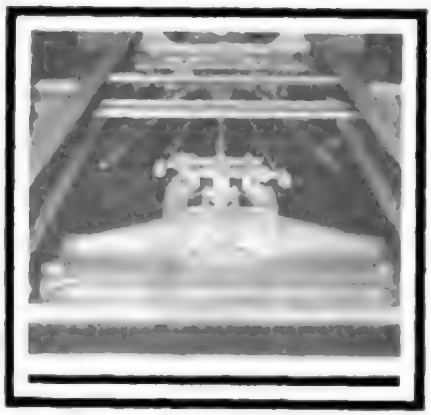


UNIVERSAL CARBURETTER ADJUSTMENT

of the footboard. Although but the one size is made at present—1,000 pounds—plans include the addition of another, rated at 1,500 pounds, in the very near future.

In the new International, the makers have attempted and achieved the production of a fairly light delivery wagon capable of high speed carrying comparatively heavy loads, and the most starting feature of the whole design is that there is nothing startling in its make-up—unless the use of a very long stroke motor and a four-speed selective gearset can be styled startling; in the fewest possible number of words, it is a standard vehicle throughout and is unusual only in the employment of cushion tires in the rear, where all of the load carried by the vehicle is supported, and pneumatic tires in front to permit a somewhat better cushioning of the shocks which otherwise would be transmitted to the motor. The motor is arranged forward under a hood, after the manner of the pleasure car, and therefore is conspicuously accessible; its bore and stroke are 3½ and 5½ inches, respectively.

Perhaps the most notable of the inevitable "tendencies" that are looked for at every show and that never fail to turn up, is the marked favor which is shown to left-side steering, which seems to have established itself even more firmly than was expected, inasmuch as some 55 per cent. of the exhibitors at the two divisions of the show in

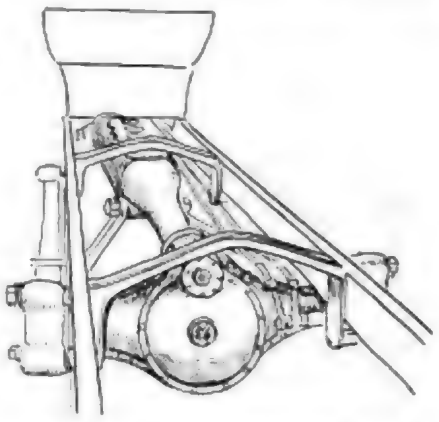


STUDEBAKER REAR AXLE

New York have steering wheels on the left side—and those who go to the left stay there. It is probable that the approaching Chicago show will include an even greater proportion of this type. As might be expected, the older and more conservative makers are usually the slowest about making such changes, while the less firmly established concerns cross the seat with little or no hesitation, once they are convinced; and the newcomers, as a rule, seem to favor left steering.

While there are a few instances of distinct and uncompromising individuality — by which nothing implied by the term "freakish" is meant—there is a much more marked inclination on the part of manufacturers to form groups, in a sort of involuntary way—that is, several makers will work along the same general lines, each working out some principle in his own way. Just what is meant by this is very well exemplified by the worm drive contingent, which includes seven manufacturers—Pierce, Studebaker, Smith, Rowe, Universal, Blair, and Schacht. All are gasolene cars with the notable exception of the Studebaker electric.

Flanking the new International delivery wagon, there is the usual formidable array of other International products, of course, the clean-appearing and business-like Saurers, which scarcely have changed at all in the past twelvemonth; a massive 10-ton Hewitt, which, as usual, is the largest vehicle in the show, and which certainly has not changed a bit since last it appeared, and the capable-looking Macks—a whole battery of them, including the familiar power dumping

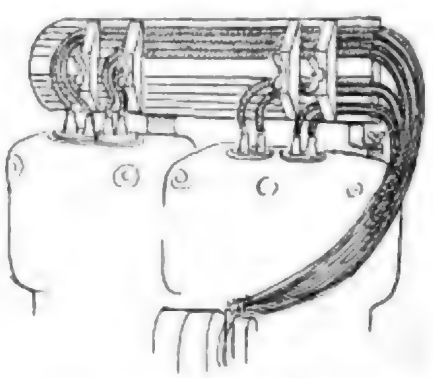


SMITH MILWAUKEE TRANSMISSION

truck that made its appearance at the last show.

But whereas the Mack dumping truck was one of only a few of the kind at the last show, at the present show it is one of a fairly large number. No less than eight makers exhibit vehicles of the kind, several of them being brand new, to say nothing of three or four more who show heavy trucks that are dumped by hand-operated mechanism.

That power driven mechanism is much



VULCAN IGNITION WIRING

preferred, however, probably by reason of the fact that plenty of power for the purpose always is available, is evidenced by the Pierce-Arrow truck, for instance, which last year was dumped by hand but which this year has been equipped with an unusually simple and smooth-operating hydraulic apparatus which makes no bones whatever about hoisting up a five-ton load in a jiffy.

In working out the design of the Pierce-Arrow hoist, cognizance has been taken of the fact that it is undesirable for the hoist-

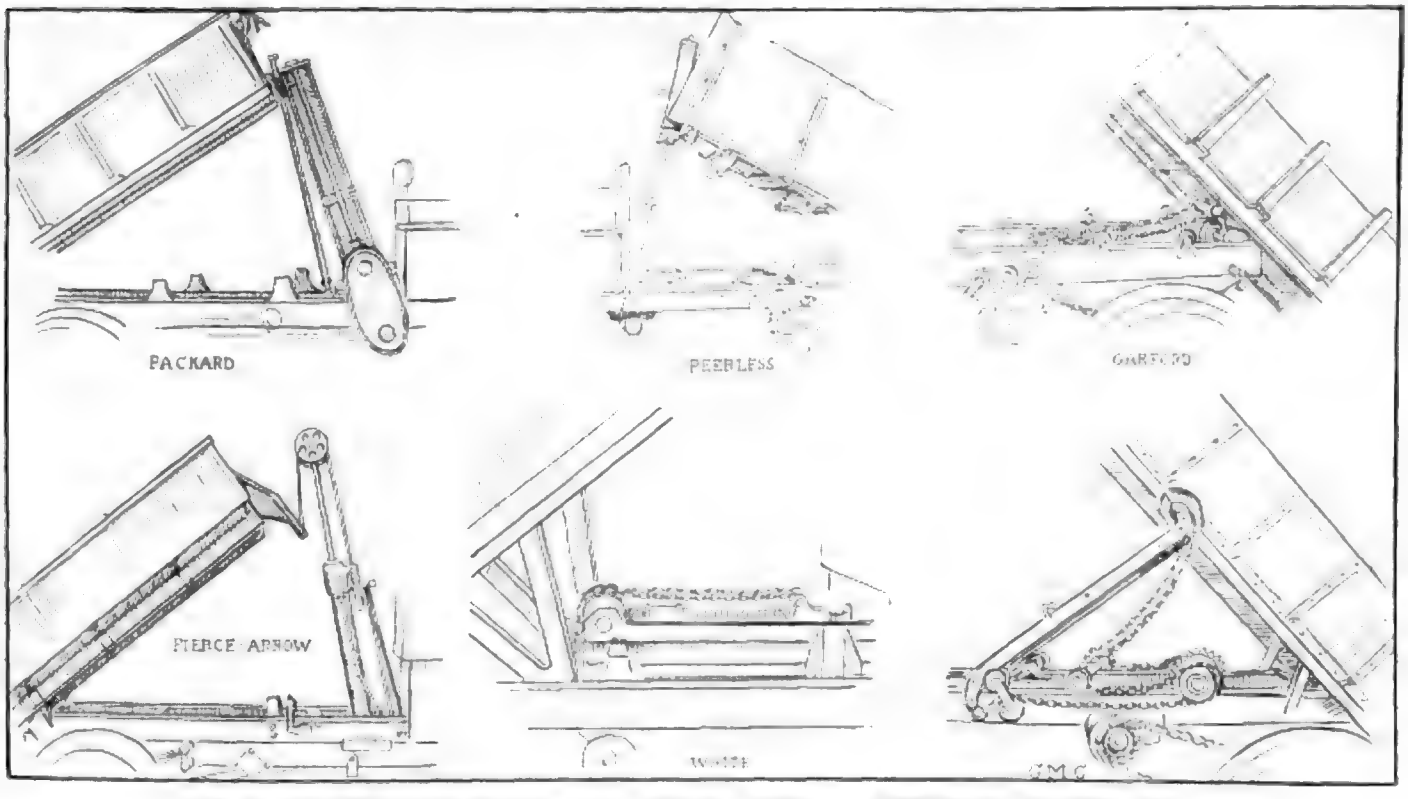
ing apparatus to protrude above the height of the driver's cab, if possible damage by collision with low-hung structures is to be avoided, and for this reason a system of leverage is employed which imparts to the body twice the motion of the elevating plunger. In its simplest aspect, the elevating gear complete consists of a hydraulic ram in which oil is used as a medium, the oil being contained within the cylinder of the ram at all times. When the driver pulls a small lever conveniently located at his right hand, a small but substantial rotary pump geared to the transmission through the intermediary of a chain, is set in motion and pumps the oil beneath the ram from above it, where it normally is contained when the body is lowered and at rest. The oil, under pressure, forces the piston up until the top of the stroke is reached, at which time a strike plate opens three valves in the piston, allowing the oil to escape freely into the top portion, thereby holding the body at rest. Needless to point out, the body may be stopped in any intermediate position merely by stopping the oil pump. Except for the addition of the power dumping model, and a few minor alterations such as the use of slightly heavier springs and a larger radiator, the Pierce-Arrow line is much the same as it always has been and, as usual, it is one of the few worm-driven vehicles on view. A new steel tool box has been added, however, that is unusually roomy and is calculated successfully to withstand the assaults of thieves of any or every variety.

Telescoping Type of Screw Dump.

Among the screw dumping bodies, the Peerless is unusual in that a double screw is employed—one screw telescoping within the other. The screw is turned by a set of bevel gears driven by chain and sprocket. The sprockets are in turn operated by another bevel gear driven from the transmission counter shaft. The mechanism is set in motion by a lever in the driver's compartment. The peculiar advantage of this particular construction, of course, is that when the body is lowered, the screw does not project above the cab; incidentally, except when the body is raised, when the screw is protected by the body itself, no harm can come to the hoisting gear for the reason that it is completely enclosed within a tight tube. Immediately the body reaches its limit of elevation, an automatic stop prevents damage to the mechanism. As for the other trucks in the Peerless exhibit, they reflect the familiar Peerless construction, which has solidity and simplicity as its two most conspicuous features. Scarcely a change worthy of note has been made since last they were exhibited.

Similarity in Two Different Makes.

The Packard hoisting mechanism, exhibited on a three-ton chassis, is not altogether unlike the Peerless apparatus in that it also is of the screw variety. It differs from the other, however, in that there is but a single screw, though like the other it is operated through enclosed gearing by the engine. In its simplest aspect, the mechanism consists of an enclosed screw upon which there is, for simplicity in explanation, a large nut connected to the front end of the body. As the screw is rotated by the engine, the nut worms its way upward, or downward, according to the direction of rotation of the screw, and carries the body with it. The operating lever is placed at the driver's left hand and the mechanism is equipped with an automatic stop to limit its travel.



STUDY OF TRUCK DUMPING MECHANISMS SHOWING SEVERAL SOLUTIONS OF THE PROBLEM

Although the Packard dumping mechanism is exhibited on a three-ton chassis, which, by the way, is almost exactly like its predecessors, little room for improvement having been found, it may be applied also to the new five-ton vehicle, the first of which makes its initial appearance at the show. Contrary to any expectations which might have been engendered, the new Packard differs in no way from the two- and three-ton vehicles which in past years have established the Packard reputation for reliability and service. It is larger, of course, though there can be no mistaking the Packard earmarks. Another almost equally interesting exhibit at the Packard space is a large van constructed for the United Cigar Stores Co. It contains humidors.

The Alco dumping arrangement is entirely different from any of the others,

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though its operation depends upon the rotation of a great, heavy screw. The screw, however, is placed beneath the body, longitudinally, and is operated by gearing from the driving shaft. Heavy chains which wind up on the worm as it is rotated hoist the body up into the dumping position—and the angle of inclination is sufficient to slide 'most anything from coal to wet sand or cement out of the body in a hurry.

Mechanically, the dumping Alco and all the others have changed but little, as was made plain in Motor World's Before Shows issue. The new dry-plate clutch which has been adopted is an uncommonly neat piece of work and quite appropriately it is calculated to reduce work. Hardly any pressure at all is required to release the clutch. Incidentally, the clutch is completely housed to prevent the ingress of foreign matter, though the housing is quickly and easily removable, leaving the clutch as "get-atable" as any one could wish.

Making the Motor Dump the Load.

The Garford company, of course, makes a variety of power dumping trucks, included among which there is one that *rises* straight up on its hind legs, so to speak, and discharges its load through a chute at the side. However, the one that is exhibited is of the more orthodox end-tipping type that is hauled into position by heavy chains from the motor. Changes in the construction of Garford trucks also are scarce, though the vehicles themselves are none the less interesting. In one of the three-ton models, for instance, there is a novel method of mounting the oil side lamps behind the dash, permitting only the fresnal glass lenses to show through, thus giving the idea that electric lights are used. As a matter of fact, electric lights, set in flush with the dash, really are used in another of the three-ton models; a storage battery feeds them.

Another of the battery of dumping trucks that is interesting is the White. In this truck, too, the body is tipped up endwise by means of heavy chains, the unusual feature of the arrangement being in the method of drive, which permits the body to be raised or lowered at four speeds; which means, of course, that the tipping mechanism is "aft" the gearset and operates through it. Despite this fact, however, the body may be raised to any angle—45 degrees being the limit—and stopped, when the tipping mechanism may be disengaged and the vehicle moved backward or forward until the gasolene gives out without affecting the angle of inclination.

There are other things, too, at the White exhibit which serve to draw crowds. There is an uncommonly "classy" white ambulance, for instance, that is complete even to a wash basin and appears so "comfy" inside as almost to invite sickness or accident. Also, there is a six-cylinder combined chemical and fire hose wagon which bears the distinction of being one of the two six-cylinder vehicles in the show. The reason for the six-cylinder motor, it is explained, is to permit real speed, and to further its accomplishment the vehicle is fitted with the regulation White electric lighting and engine starting system. There is a great high tower wagon, too, that is one of many delivered to street railway companies for the relief of broken wires and the rejuvenation of "dead" arc lamps.

The G M C line, produced by the General Motors Truck Co., also includes a well-thought-out example of the species dumping truck, the dumping mechanism being operated by the engine through an auxiliary shaft with its own gears, which drives a second shaft mounting a drum on which the chain is wound. The rest of the line, by the way, is distinctive by reason of the first appearance of two new models in which the motor is placed forward under a hood, in contradistinction to the older vehicles, in which the motor is placed beneath the floorboards. The two models are a 3½-ton truck and a 5-ton truck, though except for the change in the location of the motor they are almost exactly like the others. In the smaller models—namely, the 1¼-ton and 2-ton vehicles—a cone clutch with the familiar adjustable face is employed, and instead of four forward speeds there now are only three.



GARFROD TRACTOR AND DUMPING TRAILER—CAPACITY 12 TONS



ALCO DEMOUNTABLE BODY, SHOWING USE OF "DEAD" WAGON

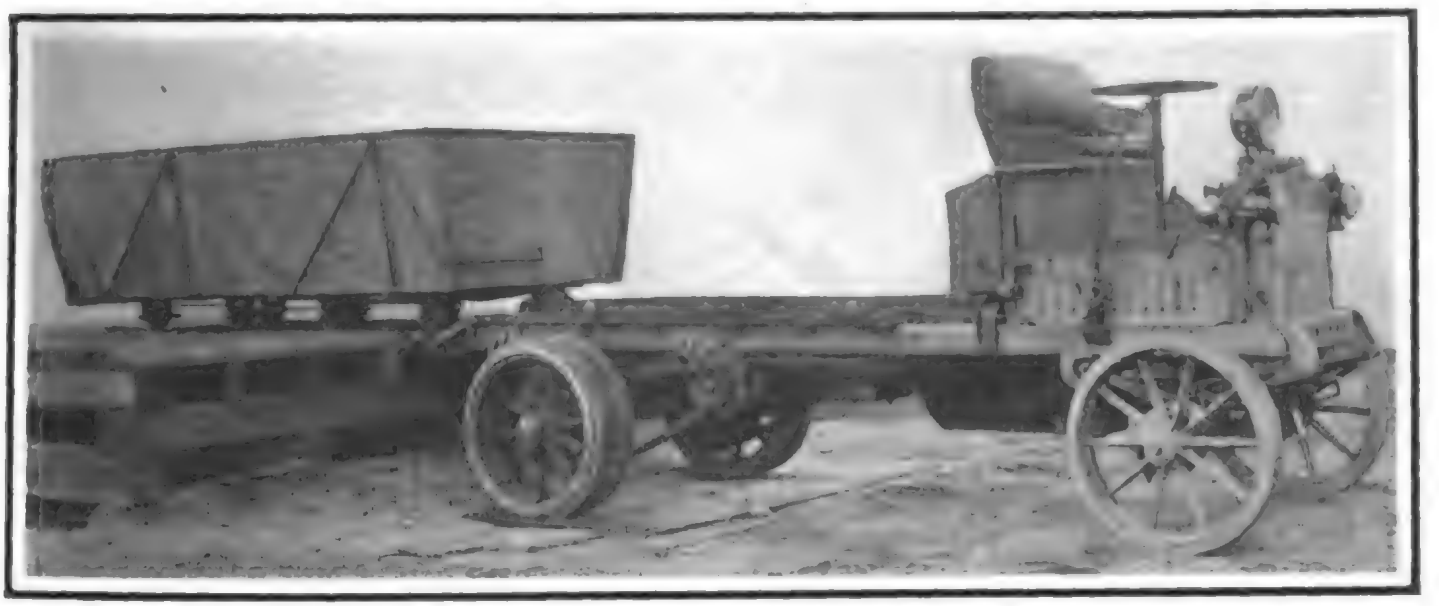
Among the three or four hand-dumped trucks exhibited, the Speedwell is an example of the simplicity which can be obtained in such construction, and as an indication of the efficacy of the method it is pointed out that a full load can be dumped and the body returned to position in the short space of time of a minute and one-half. In operation, a lever first is placed on one shaft a few turns of which suffices to raise the body about an inch, after which the lever is changed to another shaft and a dozen turns or so slides the body backward until it teeters and finally dumps itself.

Speedwell trucks always have been distinctive by reason of the location of their motors under a side-tipping combined driver's seat and cab, though now they have been rendered even more distinctive by reason of the improvements that have been worked out. The motor suspension, for instance, is brand new; whereas it was rigid before, it now is flexible, the power plant being mounted on a sub-frame which pivots at the rear end and is carried on double coil springs at front, permitting a degree of combined flexibility and rigidity that seldom is excelled. Also, there is a new style jackshaft anchorage with a separate mounting for the radius rods, and the brakes have been placed at the ends of the jackshaft; all the models now are equipped with governors and all of them have new carburetters in which the air is heated; the frames have been braced and strengthened and a new wood bumper continuous with the frame has been added.

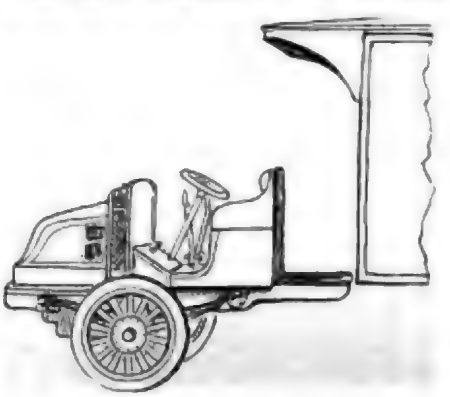
Details of Dumping Mechanism.

Getting away from conventional practice in the design of power dumping bodies, the Locomobile company has killed two birds with one stone, so to speak, by providing a brand new type of body which is not only dumped by the power of the engine but which is demountable—also by the power of the engine—as well. The whole exhibit, consisting of but two vehicles, is a more than ordinarily interesting one that never fails to attract a big crowd that hangs over polished brass rails and just naturally gapes as a big five-ton truck alternately rolls backward and forward, dumps its body and "demounts" it on an elevated platform at the rear.

The operation of the whole mechanism is beautifully simple. A single screw the length of the chassis is mounted longitudinally and driven by gearing from the engine. The screw carries an arm attached at one end to the center of the movable body, which slides on metal ways provided with lips at the rear extremities. If the body is merely to be dumped, the screw is set in operation, thus moving the body backward until its rollers drop into the lips at the end of the chassis frame, when the action of the arm pushes the fore part of the body up, dumping out the load. When the body is to be dismounted, the truck is backed up to a loading platform of the proper height and the screw put in operation. As the body is pushed backward it naturally comes to rest on the loading platform and its running wheels do not drop into the lips in the metal ways. The body is pushed steadily backward until it is entirely free of the truck chassis, which then may be moved away to receive another loaded or unloaded body, as the case may be, the power of the engine being used to place the second body on the chassis.



LOCOMOBILE COMBINED DUMPING AND DEMOUNTABLE BODY TRUCK, SHOWING METHOD OF DISMOUNTING BODY



LATIL FRONT WHEEL DRIVE

The other Locomobile combination, which scarcely is less interesting, has been designed primarily for the handling of lumber in the most expeditious manner possible. It consists essentially of a Locomobile chassis—all of them are of five tons capacity, by the way—and an extra "dead" wagon. On the chassis is mounted a special body and by means of the same type of gearing as is used in the dumping truck, except that it is hand operated, the body may be slid off the chassis on to the "dead" wagon, the operation requiring but a few moments. Incidentally, by sliding the movable body backward until it projects several feet beyond the end of the chassis, it is possible to transport lumber in longer lengths than can be transported ordinarily.

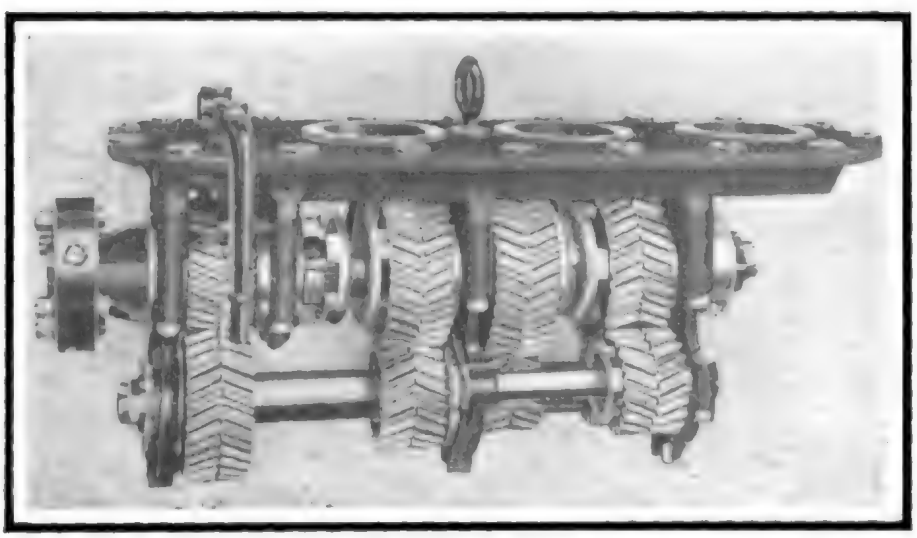
Except for the addition of these two new body styles, the Locomobile chassis, which made its initial appearance at the last show, has undergone no changes in the interim, though a number of minor improvements have been made. One of them, which is calculated to encourage the stopping of the engine during the time the truck is loading or unloading, is the location of the ignition switch at the side of the dash-

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board, where it may be reached conveniently when the truck is idle. The switch is enclosed in a neat aluminum housing to make it waterproof, and only the handle protrudes.

Alco "Dead" Wagon Construction.

Another interesting type of demountable body built along somewhat the same lines as the Locomobile, is the Alco. It differs from the former, however, in several respects. The body portion is mounted on wheels which run in metal ways and the "dead" wagon also is equipped with the same type of metal ways as are used on the truck. The modus operandi is to back the "dead" wagon up to the truck, when two small "gangways" may be let down and the loaded or empty truck body can be run off, permitting the use of the chassis for other purposes. In the Locomobile "dead" wagon the designers have obviated the necessity for obtaining perfect alignment between the truck chassis and the "dead" wagon by providing a swiveling arrangement on the latter which permits of the load being transferred, even though considerable discrepancy in alignment obtains.

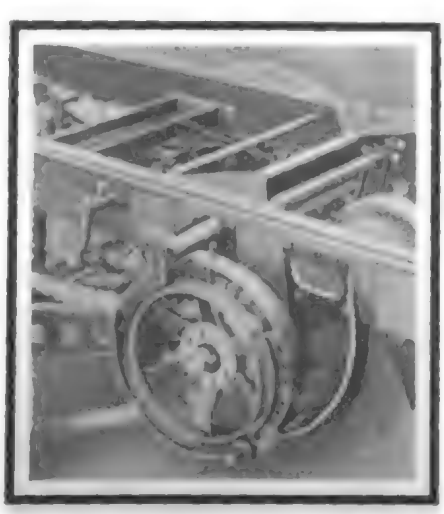


SMITH-MILWAUKEE GEARSET SHOWING WIDE FACE HERRINGBONE GEARS

Use of Martin Tractor Illustrated.

At the Knox stand, the Martin tractor is exhibited for the first time in connection with a proper trailer. To those who have moderately long memories, it will not be difficult to recall the first appearance of the Martin tractor at the last show, when it was perched atop a heavy Knox chassis, where, though an excellent idea of its construction could be obtained, it was difficult to judge of its actual utility. As it is exhibited at present, however, properly "hitched" in one case to an open stake trailer and in another to a closed body similar to one already purchased for the collection of garbage in New York City, its possibilities loom large. For the edification of those who are unfamiliar with its construction, suffice it to say that it is a three-wheeled vehicle—the only "three-wheeler" in the show, by the way—in which the motor is carried forward under a hood and behind a radiator, the single front wheel being small and the rear wheels being large and shod with dual rubber tires.

Although no changes in construction are apparent in the Martin tractor, the other Knox vehicles exhibit several important alterations calculated to increase their efficiency and to render smoother their action. Thus, for instance, the main driving gears in the gearset now are spiral instead of spur; all of the chassis have new long-stroke motors and metal covered universal joints now are common to all; jackshafts and tires have been made slightly heavier, and another smaller change pertains to the cooling fans, which now have three blades instead of two blades.

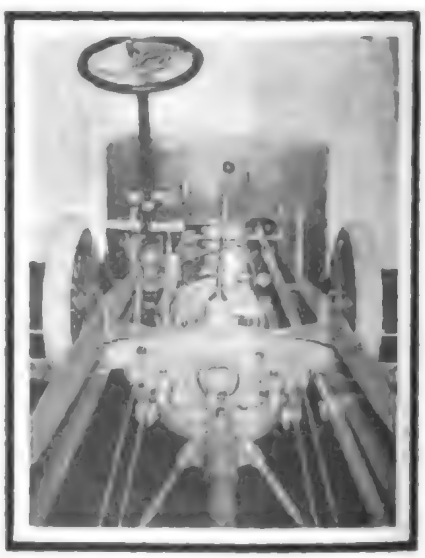


POPE-HARTFORD BRAKES

The only other tractor in the show is the Garford, which naturally is of the four-wheel type; nominally, the chassis is the same as that used for the standard five-ton truck, though it is considerably foreshortened. Incidentally, the foreshortening brings to light another advantage of the tractor and trailer apparent in the extremely short turning radius which is possible. This Garford tractor and trailer, it is pointed out, is capable of transporting 12 tons with practically none of the load weight carried by the rubber tires of the tractor.

Truck of Tractor Characteristics.

Although it is not a tractor, strictly speaking, the Walter Latil drive truck still partakes of some of the features of one, for the reason that the power unit virtually is separate from the load carrying unit and supports but a small proportion of the load. The other trucks at the Walter stand are distinctive by reason of the use of the Westinghouse individual clutch transmission, though its use is not new and has been featured by Walter products ever since their appearance, some time ago; this is the first time they have appeared at a public exhibition, however, and a critical examination of their construction reveals little or nothing that is not orthodox in pattern. One of the chassis exhibited, it is true, is equipped with the new Westinghouse air springs, though it is explained that they are not standard equipment and are attached to the chassis as much to test them out as to exhibit them to the gaze of the public. Apparently, only one material change has been made—the service brake has been placed on the jackshaft inside the chassis frame and is very nearly completely enclosed by means of a metallic housing.



BUICK TORQUE TUBE ASSEMBLY

Among the trucks that make their initial appearance at any show—the list including Willys, Utility, Hupmobile, Selden, a new model Reo, a new five-ton Pope-Hartford, a new light Kissel, and the rejuvenated Kelly-Springfield line—none is a real surprise nor contains anything of a really surprising nature, though in all of

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them there are individualities which preclude the possibility of generalizing.

Many Machines for Light Loads.

The Reo, for instance, is the first four-cylinder Reo truck to put in an appearance, and is interesting for this reason, if for no other. There are several fine points in its design, however, which will bear close scrutiny, and among them the employment of a detachable tube radiator is a feature that should be appreciated by owners whose drivers are wont to act carelessly. Another feature which is calculated to suppress that brand of carelessness evident in fast driving, is the governor. It is a hydraulic device mounted directly on the intake manifold and operated by the pressure of the water in the cooling system. Appreciating that the comfort of the driver may have a decided effect on the efficiency of the vehicle, the designer has placed the gearshift lever between the front seats, where it is at once out of the way and perfectly accessible.

The Hupmobile delivery wagon that makes its first appearance at a show, though it has been in existence plenty long enough to make a reputation for itself, is essentially the pleasure car chassis, in which a few modifications have been made with a view to generally strengthening the structure. Though there can be no doubt that in its revised form it really is a commercial vehicle, the addition of a governor removes even the last suspicion of doubt. The governor is adjustable for any speed, and is unique in that it operates to hold the speed of the vehicle within the prescribed limit without affecting engine speed, thus permitting the use of any speed in the gearset for heavy pulling. It is a centrifugal device operated from one of the front wheels by means of a set of gears and a flexible shaft similar to that used in driving speedometers.

The Selden is another light truck that has been on the market for some little time, though it has not previously been publicly exhibited, and, like the others, its construction is perfectly rational and standard, though it incorporates a number of features that are all its own. The jackshaft, for instance, is mounted on the chassis frame in ball and socket joints, permitting slight frame weaving without the danger of damage resulting; another interesting point is the manner in which the radius rods are attached to the chassis, also through spherical joints.

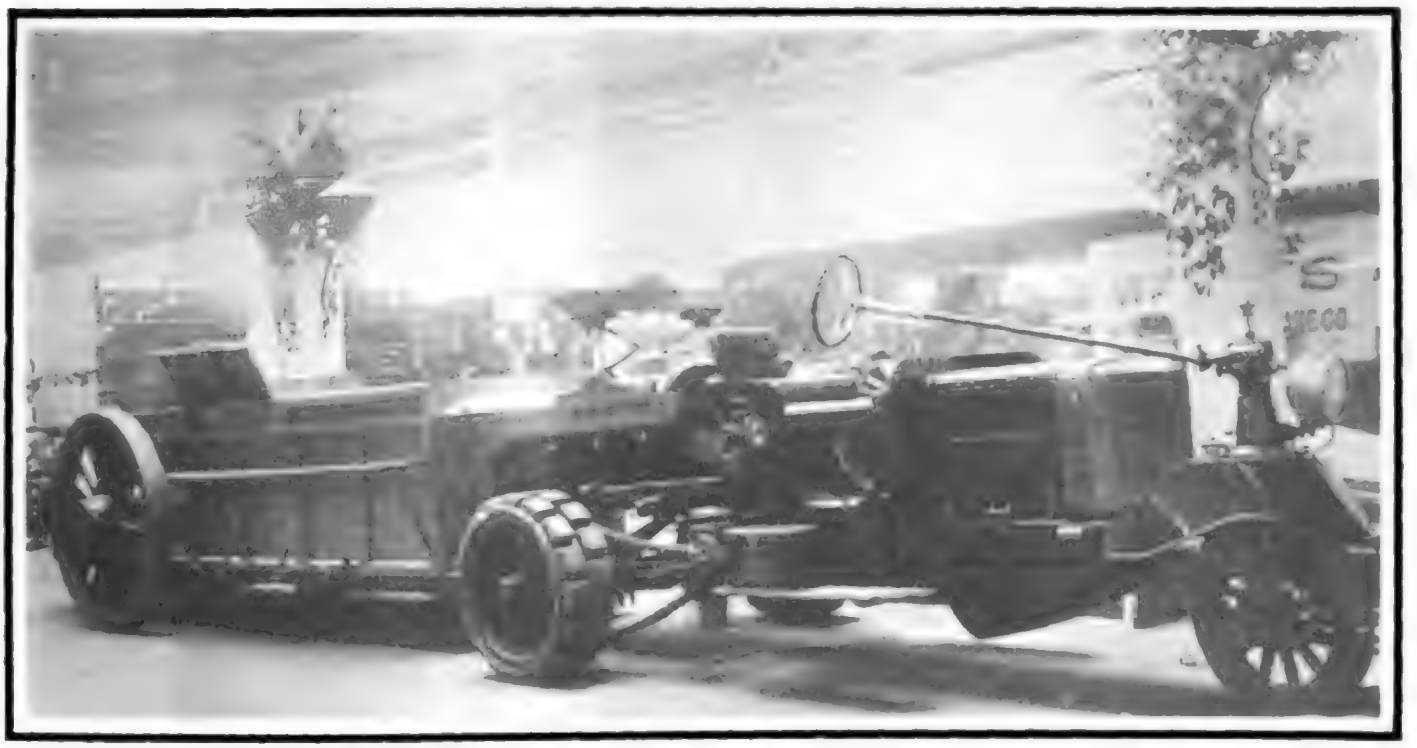
Surprise That Was Anticipated.

Exhibited side by side with the other and larger products of the Gramm Motor Truck Co., the Willys Utility wagon forms a sort of a mild surprise, for though it was known to be in active process of development, only its appearance made known that it is ready for the market. Though in its material aspects it appears slightly like a modified pleasure car chassis, if viewed from afar, closer inspection reveals that there really is scarcely one little thing about the truck which suggests pleasure car practice—that it is a real commercial vehicle designed primarily for goods transportation, and that it has been designed to provide a more than ordinarily wide margin of safety; as an example, it is rated at 1,500 pounds capacity, though it is pointed out that the safe maximum load may be 500 pounds more.

Some of the Detail Refinements.

By way of providing plenty of power, a four-cylinder vertical water-cooled motor with cylinders measuring 4 x 4½ is used; the rating is 30 horsepower. Power is transmitted to a jackshaft through the intermediary of a cone clutch and selective gearset, and thence to the rear wheels by means of side chains. Conforming to the general practice, the steering wheel is located at the left side with the control levers in the center of the footboard.

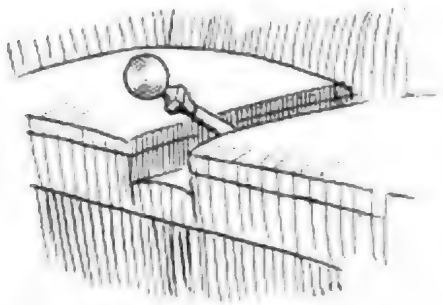
As for the other Gramm products, they are quite similar to their immediate predecessors, except that they are all fitted with governors. As is but natural, they have several individual characteristics, among which the accelerator, its position and its method of operation are enlightening as indicating a trend toward greater safety. Instead of operating by downward pressure, the accelerator swings sideways, so that no amount of instinctive bracing on the part of the driver in the face of impending trouble can precipitate an accident. Another point about the chassis which is interesting is the method of mounting the springs on rollers in slots carried by the chassis frame. In this way, the usual spring shackle is eliminated without impairing the latitude of movement of the springs.



MARTIN TRACTOR ATTACHED TO GARBAGE COLLECTION WAGON WHICH FORMS PART OF KNOX EXHIBIT IN GARDEN

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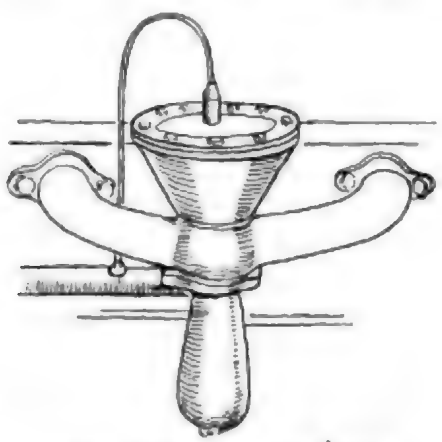
Although the Kissel 2,500-pound truck which is exhibited for the first time is new throughout and represents the most recent addition to the already extensive Kissel line, there is nothing in its make-up that is really radical in design. In the fewest possible words, it is a standard product. Its most distinctive feature is its low-hung appearance and the use of a radiator the top and sides of which are finned to facilitate the



REO GEAR SHIFT LEVER

dissipation of heat. Incidentally, the radiator is supported on springs, as is the whole plant, the latter being mounted in a subframe on the main frame. The motor is rated at 36 horsepower and measures 4¼ x 5¼ inches bore and stroke, respectively. By way of discouraging speeding while at the same time leaving the motor free for hard pulls on low gear, a governor limiting the speed of the vehicle but not the speed of the motor is employed.

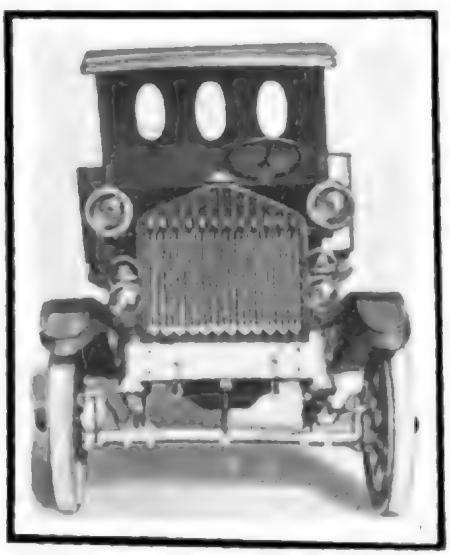
The most conspicuous feature of the new



REO HYDRAULIC GOVERNOR

five-ton Pope-Hartford truck that since last show has been added to round out the line is the brake mechanism, which almost truthfully is colossal; not inappropriately the new brakes are styled "locomotive" brakes; they are common to both the three- and the five-ton chassis, their incorporation in the former being about the only change that has been made, barring, of course, the adoption of a larger motor. Another new feature of both chassis is the manner of mounting the driver's seat and cab; in the new construction, the whole cab may be tipped backward, completely exposing the power plant without the necessity for disturbing even the control elements. One of the features of the five-ton chassis which scarcely can be overlooked, is the exceptionally liberal tire equipment—rear tires measure 42 x 6 and are dual and front tires measure 38 x 7, single.

The Kelly-Springfield line is not new, of course, though to a casual observer it might well appear to be new, what with the slanting hoods and Renault type radiators that have come with the adoption of water-cooled motors in place of the air-cooled engines that served for so long to distinguish the line. The new motors, by the way, are exceptionally accessible, just one instance of the elimination of complexity being the mounting of the magneto and the water pump up front on a transverse shaft; the

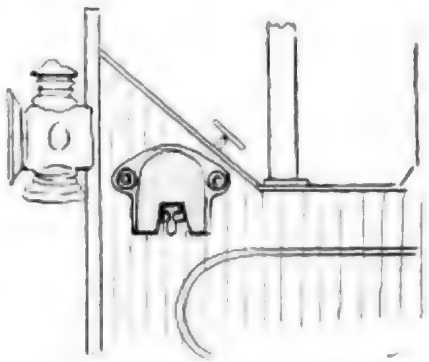


REO DETACHABLE TUBE RADIATOR

oil filler cap also is up front, where it is instantly accessible, and the breather pipe is located between the two pairs of cylinders, where it is out of the way.

By way of housing the fan, which is placed behind the radiator, in contradistinction to the usual construction in which the Renault type of radiator is used, a dome-shaped metal casing serves also as part of the footboard. The fan belt adjustment is more than ordinarily simple, the fan being mounted on a transverse arm which serves also to provide a measure of protection for the radiator. One end of the arm is slotted and held in place by a large nut, which, when loosened, permits the arm to be moved a few inches in order to tighten the belt. Another clever adjustment is to be found in the radius rods, which are provided with means for taking up the slack in the driving chains.

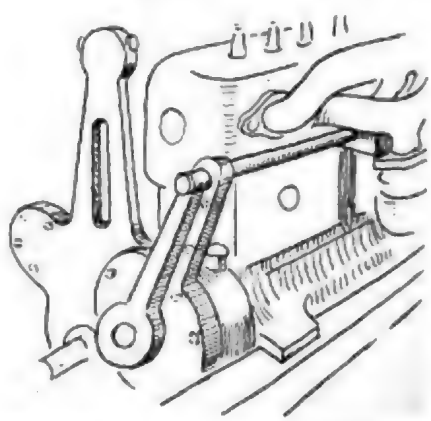
Among the older cars that make their appearance perennially with scarcely any change to distinguish them from their forbears, there are the Autocar, the Velie and the Federal, the first and the last being made in but one capacity each. As usual, the Autocar exhibit is one of the most complete in the show, and quite as much as usual it requires a very high-powered magnifying glass to discover any material alteration in construction. One very important change has been made, however, though it is a change in price and not in design—



LOCOMOBILE SWITCH POSITION

hereafter the chassis will list at $2,000 instead of $2,150.

As for the Federal, there is even less change apparent in its construction, though it goes without saying that a number of improvements not visible to the naked eye, though nevertheless increasing efficiency, have been made. One point that is peculiar to the Federal is that the steering column is absolutely devoid of all devices; there is no spark control lever, for the good and sufficient reason that set spark ignition



STERNBERG GOVERNOR CONNECTION

is employed and the throttle is controlled by a pedal.

Representative of the Velie line, which is more complete than the exhibit presupposes, there is a three-ton chassis, a one-ton chassis and a two-ton vehicle complete, and in none of them is there apparent any material deviation from previous practice. Chiefly conspicuous is the method of hanging the springs outside the chassis frame instead of beneath it, as is the common practice; this construction, it is pointed out, permits of a lower center of gravity. Another feature which is most conspicuous

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of course, is the method of equipping the radius rods with heavy spiral springs by way of lessening the road and driving shocks ordinarily transmitted to the chassis.

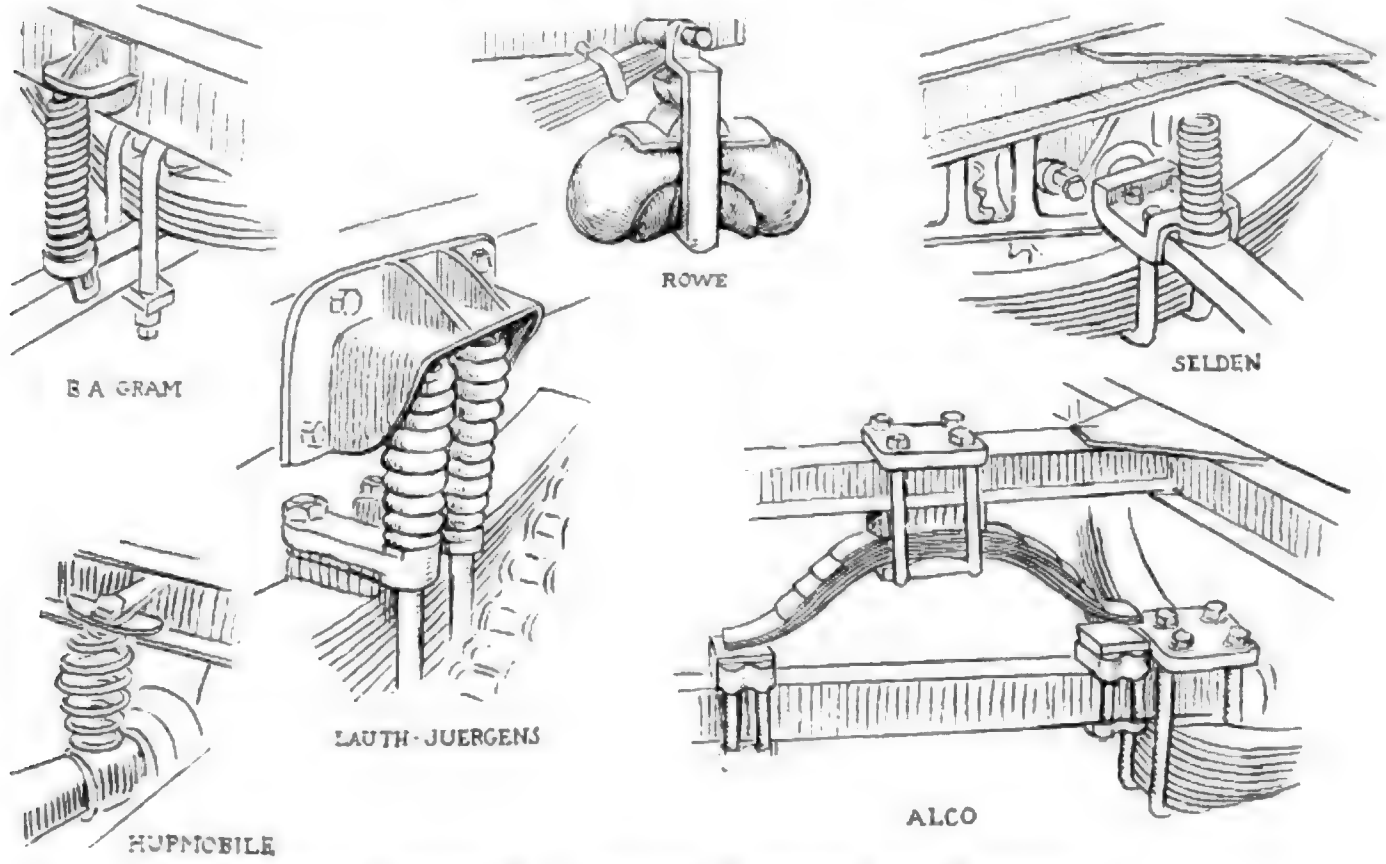
Final drive through live axle and gears, the weight of the car being carried by a separate "dead" axle, is the "tie that binds" another group together. Four makes of this drive are shown, one being the new Studebaker gasolene truck, another the Latil front drive machine, a third the big Mais, which has done much to make this drive familiar in the United States, and the fourth the Brown, an extremely neat machine and

which cannot be classified, for the reason that the mechanism inside the casing is regarded by its inventor as a deep, dark secret—notwithstanding the fact that patents have been applied for, that trucks fitted with the governors are for sale and that anyone who wants to know very badly can buy or borrow a machine and take down the casing!

One of the bright little ideas of the show is the color scheme of the new Stewart chassis. At the first glance it might appear that the makers tried to see how many different kinds of paint they could get on

are concerned. Some of the machines are quite well known through published descriptions and through cars in actual service—B. A. Gramm, Stewart, and Latil, for example—while the Croce and Maccarr need an introduction—and are getting it, if the interest of show-goers counts for anything.

A feature of the B. A. Gramm truck, and one that stands out like a good deed in an evil world, to revert to the vernacular, is the equipment of all models with the Gray & Davis starting and lighting system. While many makers—most of them, in fact



VARIETY DISCLOSED BY A COMPARISON OF AUXILIARY SPRING MOUNTINGS

the smallest car shown embodying the principle in question. Manufacturers of this driving system lay great stress upon the remarkable results that have been obtained from internal gear drive in the service of the United States army and the favor with which it is regarded by military engineers.

While there has been an increase in the number of cars fitted with governors for preventing the attainment of excessive speeds, there appears to be considerable doubt as to the utility of the device, even on the part of some of those who fit it to their cars. Nevertheless—the governor is gaining ground, and there is good reason for it. Most of the governors are of the centrifugal type, the exceptions being one or two hydraulic devices and at least one

one chassis; but a little investigation develops the fact that all the members of each system are colored alike in order to facilitate the following out of connections and functions. For instance, the foot brakes and all connections are blue and the hand-braking parts red; the transmission system, orange; the steering system, light brown; cooling system, yellow, and so on, throughout the chassis. While this is intended as a show "stunt," designed to enable visitors to understand more readily the construction of the chassis, the idea seems too good to be ignored after the shows are over.

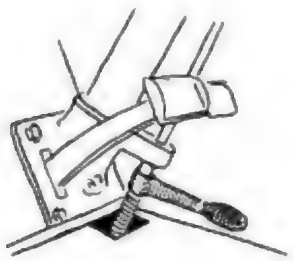
Not a few commercial vehicle makers are experiencing the delights of a truck show—or, at least, of a national function—for the first time, so far as their present exhibits

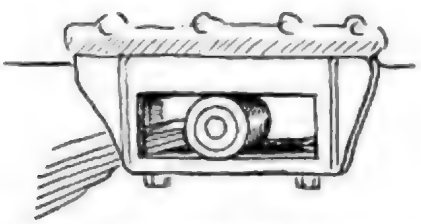
—are waiting for someone else to "start something," the B. A. Gramm people have taken the leap and are confident that the starter is the right thing not only for the user but for the maker—in one case as an economy and a convenience and in the other as a getter of business.

The two models of the B. A. Gramm, of 2 tons and 3½ tons capacity, respectively, are practically alike except in dimensions. The same motor is used in both, with pair-cast cylinders of 4½ x 5½ inches bore and stroke. Both have dry plate multiple disk clutches and gearsets of the individual dog clutch type, the gears being always in mesh but not running when the direct drive is engaged; the smaller car has three speeds and the larger four. Motor and gearsets are sep-

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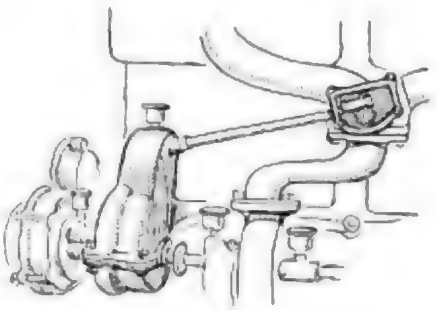
arate units; the jackshaft is of the full floating type and final drive is by side chains. A fine point in the motor suspension is that the sub-frame, to which the power plant is bolted, is carried on springs at each of the four supporting points, thus very effectually protecting the mechanism from the effects of the usual pounding. The driver's seat and the floorboards are placed directly over the motor; but they are lowered so that the top of the engine rises through the floor, which is provided with a shallow hood as a protection. Incidentally, this brings up the fact that there is a decided tendency toward this form of construction, there being five machines showing this arrangement. There are many points in its favor; the maximum loading space, with a given wheelbase length, is available without hoisting the driver's seat high in the air; the motor is accessible both from the sides and from the top; the arrangement is compact and convenient and, last but not least, even if it is rather a negative virtue, there is apparently little of importance that can be said against it. The big La France hydraulic truck, with the Manly drive, is built with the motor sharing the floor with the driver; so are the Hewitt, the Garford, the Blair and the new Croce. Not that the idea is anything at all new; it has been used for years, notably by the Hewitt; but there seems to be an increasing appreciation of its advantages. Doubtless the fact that the once popular amusement of "crawling all over" a motor has gone into the discard has something to do with it.





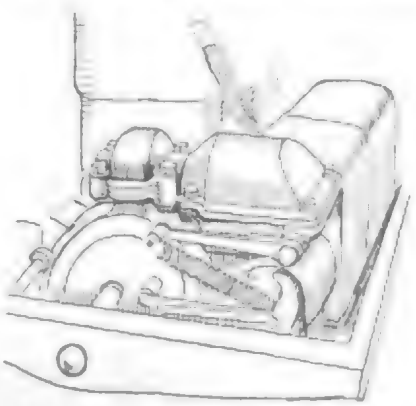
GRAHAM PEDALS AND SPRING MOUNT

The Croce, which hails from Asbury Park, N. J., where it is built by the Croce Auto Co., Inc., has had local existence for two years, but is making its first real bow to the public. It is built in sizes from a 1,500-pound delivery wagon to a 5-ton truck. One of the first details of the Croce car to attract attention is the radiator, which is of the same construction throughout the line and consists of a large number of horizontal copper tubes expanded into front and back tube-sheets; the sides and top are riveted to the tube sheets and the whole riveted to and supported by a cast bronze base of great strenth. All joints are soldered more to ensure against leakage than anything else, though, of course, this process adds a certain amount of stiffness. All the Croce machines have four-cylinder motors. In the smaller models the motor is under the floor, the hood coming up into the driver's space, and drive is through shaft and bevel gears. In the heavier cars the motors are in the usual front position and drive is by side chains.



SANFORD GOVERNOR POSITION

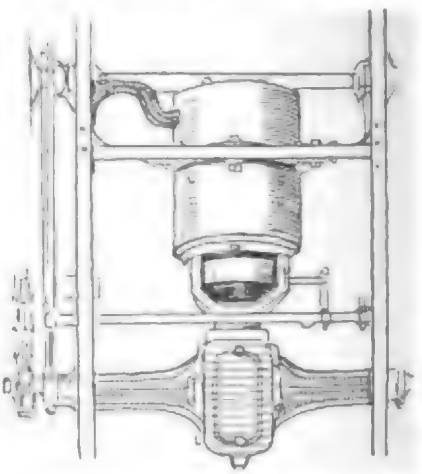
Built throughout to standard specifications and embodying nothing that is at all radical, the chassis shown by the Maccarr Co. of Allentown, Pa., is a business-like "job." Two capacities are built — 1,500 pounds and 1 ton; the smaller car has shaft drive and the larger chain. In both cases the same unit power plant is installed; the motor has four block-cast cylinders of 3¾ x 5½ inches bore and stroke with an A. L. A. M. rating of 28 horsepower, and drive is through a dry-plate multiple disk clutch and three-speed selectively controlled gearset. Pneumatic tires are regular equipment on the smaller and solids on the larger model; all wheels are 36 inches in diameter front and rear; 4½-inch pneumatics are used on the smaller car and 3-inch solids in front and 4-inch in the rear of the 1-ton car. Speed is under the control of a governor and the steering wheel is placed on the left side of the machine.



KREBS GOVERNING MECHANISM

Apart from its unique "color scheme," the new Stewart chassis of 1,500 pounds carrying capacity has many features that are of no little interest, stress being laid upon accessibility, simplicity and fool-proofness. Briefly, the car, which already has been described in Motor World and has been in actual service for some months, is of the type in which the motor, under a sloping hood in front, is backed by the radiator; drive is through a multiple disk dry clutch, enclosed in the same housing with the three-speed selectively controlled gearset, forming a unit separate from the power plant and connected to it by a short shaft which is equipped with a double universal joint. Final drive is by bevel gears to the rear axle, which is of the full-floating type.

Not only does the position of the engine permit its easy inspection from the front, the hood swinging upward and backward, but by removing the front member of the frame the timing gear casing can be taken off and, carrying the process a little further, the whole motor can be slid out with little difficulty.



LANSDEN MOTOR SUSPENSION

Every unit in the car—power plant, gearset and clutch, steering system, rear axle system, and so on—is so arranged that it can be removed intact without in any way affecting other units. The motor is of the long stroke type, with block cast cylinders, and is conservatively rated at 30 horsepower; cooling is by forced circulation, and the usual radiator fan is replaced by a set of fan-blades projecting from the rim of the flywheel. Lubrication has been very closely studied, and there is not a frictional surface that is not provided with lubricating means, and not an oil-hole that is not fitted either with an oil-cup or a grease-cup.

An interesting example of the increasing tendency to employ the tractor principle —that is, to pull the load behind the power

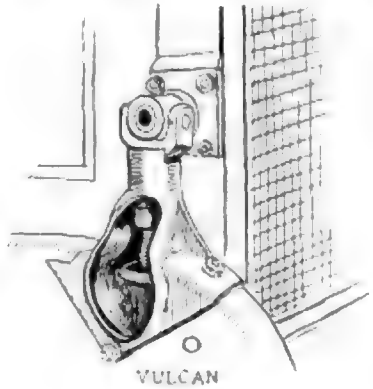
rather than push it ahead of the power—is found in the Latil front drive system, a French design, the American rights for which have been secured by the Walter Motor Truck Co., of New York, which company is exhibiting the machine at the Garden. Briefly, the Latil consists of a pair of rubber-tired artillery wheels carrying a four-cylinder motor which drives the wheels upon which it is mounted through a cone clutch, four-speed gearset, universally jointed shafts and spur pinions meshing with gears bolted to the wheels. The motor of the machine shown, which is rated as having a capacity of 2½ tons, is of 3⅛ x 5½ inches bore and stroke and has its cylinders cast in a single block. By means of suitable brackets and frames it is possible to adapt the machine to almost any body, which preferably is equipped with steel-tired wheels, thus saving the expense of a pair of tires subjected to the weight of the load. It has been found that the front drive system is particularly effective in pulling through deep snow, mud or sand, that skidding is very greatly reduced and that steering is rendered particularly easy by the application of power to the steering wheels—a fact that some are inclined to doubt, but which is a fact, nevertheless.

In the Heavyweight Class.

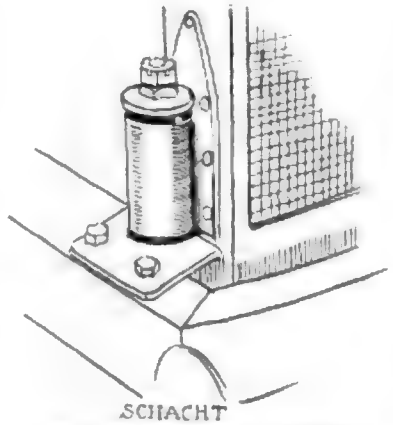
Among the distinctly big trucks of the show, and distinguished also by its unfamiliarity to show-goers—the current show marks its first appearance—is the Vulcan 7-tonner, the manufacturers of which, the Driggs-Seabury Ordnance Corp., of Sharon, Pa., are well known as manufacturers of truck parts but never before have shown a complete car. While the 7-ton machine is the largest of the line, which includes six models, the smallest having a capacity of three tons, the constructional features are practically alike throughout. Generally speaking, the machine is of standard type, with motor in front under a hood, cone clutch, three-speed gearset in the four smaller sizes and four-speed in the 6- and 7-ton, and final drive through side chains. There are, however, many details that are worked out with unusual care, and show a keen appreciation of the difficulties that must be overcome by trucks doing really heavy work. While the frame has been made exceedingly strong and substantial, care has been taken to avoid excessive rigidity; yet all parts that require accurate alignment are immovably held in line. On the other hand, the crankshaft, to cite a conspicuous example, is constructed with the rear journal exceedingly large—much larger than the other bearing sections—and the rearmost cheek is correspondingly strong. This is done because the rear end of the crankshaft has to transmit all the power developed by all four cylinders. The correctness of the principle involved is borne out by the statement that not a single crankshaft of the Vulcan type has been broken.

Small Things of Great Importance.

A very neat radiator suspension has been worked out, consisting of a pair of short, hollow sockets containing coiled springs which carry plungers pivoted to brackets bolted to the radiator. The spring sockets are mounted on the frames and the brackets on the radiator are placed near the bottom. The spring movement is sufficient to take



VULCAN



SCHACHT

RADIATOR MOUNTING STUDIES

care of all road shocks, and is effective in both directions. Another detail, which is a solution of a problem that has bothered more than one truck builder, is a differential lock that permits the driving wheels to be driven together for pulling out of bad places, but which will automatically throw out of engagement if the truck is run on a curve—which means that the differential lock will lock the wheels only when such locking is unobjectionable. The gearset is of the constantly-meshed type, with solid dog clutches. In the gearcase is another of those features that abound in the machine. The cover is in two parts—or, rather, there are two covers, one small and the other large. The small cover, at the forward end, can be replaced by a special case carrying a gear which meshes with a special gear on the countershaft of the gearset, and a shaft, projecting from the superposed gearcase, carries a pinion for the transmission of power to hoisting mechanism, winches or anything else that it might be desirable to drive.

Worm Drive in a "Land Leviathan."

Another member of the "land leviathan" class is the six-ton Smith-Milwaukee, which is being shown for the first time in the East and is further distinguished by the fact that it is the biggest of the worm-driven contingent. The first impression of this machine is one of hugeness, due to the fact that the long gearcase and the extremely large rear axle housing are connected by a steel torque tube of large diameter and, further, the frame is of massive proportions, being no less than nine inches deep. Naturally, the most striking feature of the machine is the rear axle system, which, taken as a whole, is a triangular unit consisting of the axle casing, the torque tube and two radius rods of heavy construction which extend from the outer ends of the axle casing to the forward end of the torque tube, where they converge and are secured. This ensures rigidity and accurate alignment of the worm-driving system—a matter of no small importance. The motor, which is separate from the gearcase, drives through a very large universal joint. The various units are readily demountable separately, and, notwithstanding the size and massive proportions of the machine, it is a comparatively easy matter to take down or assemble one with few tools, even under conditions not altogether favorable.

The gearset, which provides three forward speeds, is of the individual dog clutch type, and the fact that the gears are constantly in mesh makes possible the peculiarity that the teeth are of the herringbone variety. That the gears are built for downright hard truck service is indicated by the fact that they have faces no less than three inches wide. Both main shaft and countershaft, which are located one above the other, are carried in bearings suspended from the top plate of the casing, as the bearings of a motor are carried on the upper part of the crankcase. The lower part of the casing is comparatively light and serves mainly as an oil reservoir and dirt excluder. The two models, 3½-ton and 6-ton, are as like as two peas, apart from general dimensions. The motor in the smaller is of 40-50 horsepower and in the larger of 50-60 horsepower. Both are of the T-head type, with pair-cast cylinders, and are located under hoods in front. Governors are fitted to limit maximum speed.

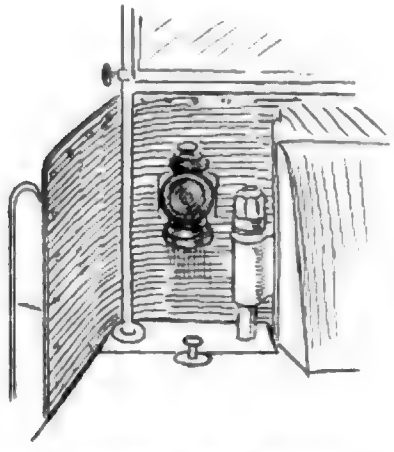
While the La France hydraulic truck is exhibited for the first time, its construction

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and method of operation are so well known that description here is unnecessary. Suffice it to say that, though the machine is the most radical departure from standard practice at the show, it has been so well tried out that it cannot be regarded as either experimental or freakish in any way. The machine exhibited has its hydraulic transmission system driven by an electric motor, and the exceedingly simple single lever control shows to the best advantage. The least understood part of the transmission system—the mechanism for changing the stroke of the driving pumps—is shown separately, so that its seemingly intricate, but really simple, operation can be studied readily.

Universal Brings Out a Worm Drive.

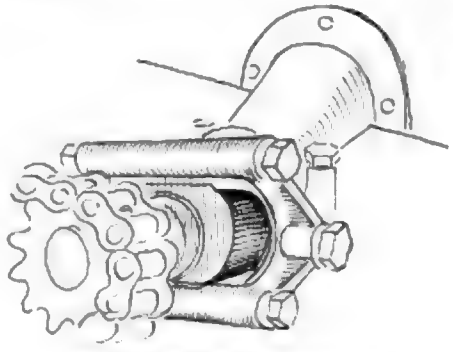
One of the new models brought out by established concerns is the Universal Motor



GARFORD LAMP MOUNTING

Truck Co.'s one-ton worm drive machine, which is an extremely business-like specimen of this very modern type of final drive. Drive from the gearcase to the worm is through a rather long propeller shaft with two universal joints; the rear axle is held in alignment and torque and driving stresses taken by heavy pressed steel channel-section rods running from the axle ends to the cross-member of the main frame. The motor, mounted as a unit with the gearcase, is of 30 horsepower, with block-cast cylinders and enclosed valves. The clutch is a dry single disk and the gearset gives three forward speeds with the usual selective control. While the machine abounds with interesting features, one example will serve to show the way in which the designers have gone at their work. The carburetter is supplied with hot air from a hood surrounding the exhaust pipe. Close to the carburetter, however, is a valve, operated by a little ratchet handle, which controls a large opening. This permits regulation of the temperature of the air going to the carburetter, for when the valve is wide open the amount of hot air drawn over the exhaust pipe is almost negligible, while when it is closed all the air taken in is heated.

Another worm-drive advocate is the Rowe Motor Mfg. Co., of Coatesville, Pa., which builds three worm-driven models, of 1, 1½ and 2 tons capacity, respectively. All three, however, are built alternately with side chain final drive, so that the purchaser can take his choice, the machines being exactly alike in other respects. The Rowe trucks have been standardized for some time; the changes made from year to year are only



KELLY CHAIN ADJUSTMENT

matters of detail that are suggested by experience.

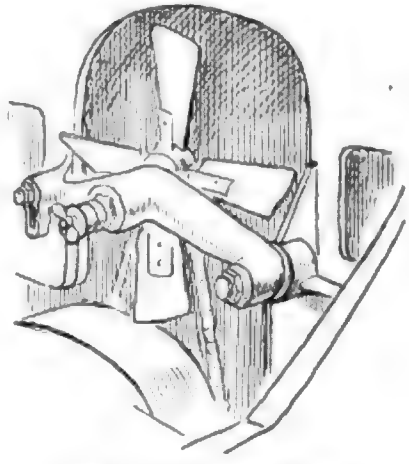
Worm drive exclusively is employed by the Blair Mfg. Co., of Newark, O., in its three models of 1½, 2½ and 3½ tons capacity, respectively. The Blair power and transmission system is unusual in design in that it forms a separate multiple unit suspended within the main frame of the car. A narrow sub-frame extends clear from the rear axle housing to the front end of the car, carrying both gearset and motor and keeping them aligned at all times with the rear axle. The sub-frame is supported on three points, so that it is not possible to cause binding or disalignment of any of the parts that should be kept free; moreover, it is a simple matter to remove the entire driving system at once, or, for that matter, to take out any one of the separate units without disturbing any of the others. The Blair motor, which is of 4⅛ x 5¼ inches bore and stroke in the smaller car and 4½ x 5½ inches bore and stroke in the two larger, are under the control of sealed automatic governors.

Also Worm in Schacht Product.

The Schacht worm drive one-ton truck presents an example of simple, substantial construction, very much like other Schacht cars apart from the final drive. It embodies the latest ideas of the builders—large wheels, but nevertheless a low-hung body, which is permitted by the use of a special form of platform rear spring suspension. On the model in question, which is only one of a line of six ranging from 1,500 pounds to 4 tons, the wheels are 38 inches in diameter front and rear. The motor is of rather surprising power for the machine, being rated at 45-50 horsepower, and has block-cast cylinders of 4¼ inches bore and 5½ inches stroke. The gearset is separate from the motor unit. Westinghouse starting and lighting equipment is installed, when ordered, as an extra.

Two New Darts But Little Changed.

The Dart Mfg. Co., of Waterloo, Ia., whose little two-cylinder wagon has been a feature of other shows and still is "doing business," has brought out two new models, of 1,500 pounds and 3,000 pounds capacity, respectively, and which are of what may be termed conventional construction throughout. They are sturdy wagons, with four-cylinder motors, 25-30 horsepower in the smaller and 35-40 horsepower in the larger,



KELLY FAN ADJUSTMENT

driving through cone clutches, three-speed selectively controlled gearsets which are built as units with the jackshafts, and side chains to the rear wheels. No change whatever have been made in the little car, its two-cylinder opposed motor and planetary transmission being "plenty good enough to let alone," in the words of the makers.

The most important change apparent in the exhibit of the Lauth-Juergens Motor Car Co., of Fremont, O., is the addition to the line of a 5-ton truck which, however, is built along exactly the same lines as the already well-known 1-, 2- and 3-ton machines. One of the interesting features of the new machine is that the bearing housings are so constructed as to be capable of taking either roller or ball bearings, so that either can be fitted at the option of the purchaser. A special Lauth-Juergens feature is the gearset, which is provided with three speeds in the two smaller models and four speeds in the two larger, including, of course, the new 5-tonner. Direct drive is on third speed in all cases; where there

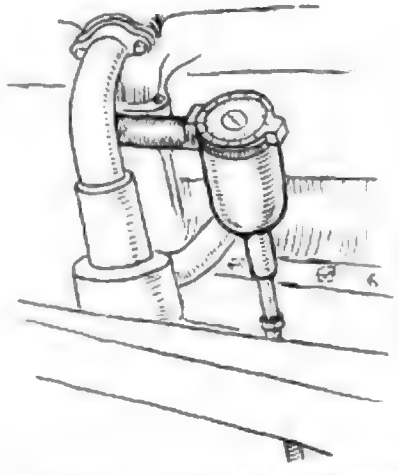
are four speeds the fourth is an overstep. The whole gearset is substantial in the extreme, and it is the particular pride of the makers. The clutch is a very simple disk affair, there being a single disk which is pressed between two driving disks when the clutch is "in." Protection for the driver always has been a Lauth-Juergens feature, and standard construction still includes a completely enclosed cab, which can be tilted bodily, with seat and floorboards, to give access to the motor in extreme cases, though for all ordinary work there is ample accessibility through the side openings.

Light Wagons of Orthodox Pattern.

A new model has been added to the line of Krebs cars—a 1½-ton machine with a four-cylinder four-cycle motor. The designation "four-cycle" is necessary in this instance, because both the other Krebs machines—1,500 pounds and 1-ton capacity—have two-cycle motors with two vertical cylinders. Like the other models, the new machine has cone clutch and three-speed selectively controlled gearset; final drive is through side chains, like the 1-ton model; the smallest car has shaft drive. Left side steering is employed. A new form of governor is used, the details of which are not available, but which evidently is of the centrifugal type; the governor acts on the throttle and the ignition simultaneously and maintains a constant motor speed under all conditions. The governor is applied to all models, though in slightly different form in the new machine from that used in the older models. Provision is made for the installation of an electric starting and lighting system which, however, is supplied only on special order and at an extar cost over the list price.

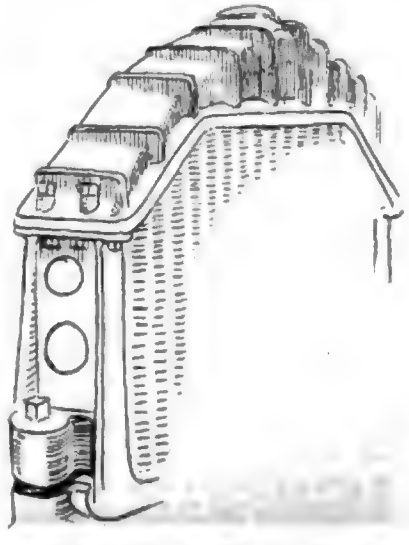
If there is any virtue in a long name there ought to be something in the "Best" and the "Flint" machines, built by the Flint Motor Wagon Department of the Durant-Dort Carriage Co., of Flint, Mich. The little "Best" wagon of 1,000 pounds capacity with two-cylinder opposed motor and two-disk friction drive, is no new thing; the changes in its construction are almost negligible. The "Flint" cars, however, are new models, with a normal load capacity of 1,600 pounds. There are no radical features; the design is of the standard type, with four-cylinder, 22-horsepower motor, cone clutch, three-speed selective gearset in a separate unit and bevel gear final drive, the rear axle being of the full floating type. It may be remarked, however, that the frame is particularly well braced in the rear, and that the triangular torque system is very neatly worked out, the two rods from the axle casing ends coming together just back of the forward universal joint of the propeller shaft and the whole triangle being stiffened by a cross brace which extends from one rod to the other and is secured to the forward end of the bevel gear casing. With a wheelbase of 106 inches the Flint wagon has a loading space 82 inches long and 45 inches wide.

While the new Brown, built by the Brown



HUPMOBILE ADJUSTABLE GOVERNOR

Commercial Car Co., of Peru, Ind., is the smallest of the machines having final drive through gears direct to the wheels, it is none the less a machine of extremely attractive design. The rear axle is held in position by the popular triangular arrangement of torque rods, the rods being considerably longer than is usual, however, in ad-



KISSEL "FINNED" RADIATORS

dition to being of ample strength. But a single model is built, having a carrying capacity of 1,500 pounds; the motor, with block-cast cylinders of 3¼ inches bore and 5¼ inches stroke, is mounted as a unit with the three-speed gearset controlled by centrally located levers. Left side steering is adopted. Incidentally, the frame of the little Brown is unusually substantial for a car of its size.

The Mais, the big, husky father of American internal-gear driven trucks, is entirely unchanged.

Standardization of Electrics.

All the electric cars are under one roof—that of the Grand Central Palace. Taken as a class the whole eight of them—Atlantic, Baker, General Vehicle, G. M. C., Lansden, Studebaker, Ward and Waverley—stand for stability in design and construction to a remarkable degree. As already has been noted, the Studebaker company has brought out a new worm-drive type, but the old line of Studebakers is continued unchanged. The General Vehicle and the G. M. C. lines remain just as they were in every respect. The Atlantic of course has not had much time in which to do any changing, this being its first big show. Its thoroughly up-to-date design and construction, conforming to generally accepted standards; it is propelled by a single motor, driving by "silent" chain to the differential on a housed jackshaft and by side chains to the rear wheels. The various models range in capacity from 1 to to 5 tons, but all are built on the same lines—a very common practice in electric vehicle building.

The Baker people are standing pat on their standard designs, having departed from standard practice only in the application of steel chain cases on the new model recently brought out, a four-ton machine. These cases are of heavy steel and not only enclose the driving chains but act as torque members, thus serving a double purpose. Otherwise the new model differs not at all from its companions. The smaller Ward cars, which originally were made with chain drive direct from motor to rear axle—single reduction—now drives through a double reduction, motor to jackshaft and thence by side chains to the rear wheels. The larger models, also with double reduction and single motor equipment, are unchanged.

In bringing out its larger model, from 2 tons up to 5 tons, the Waverley company has abandoned its former two-motor system and has adopted a single motor drive of an extremely neat type. The motor is hung from the main frames by steel brackets, with its shaft fore-and-aft; its location is back of the rear axle and above it, and drive is through a propeller shaft with two universal joints to a housed jackshaft forward of the axle. Final drive is by side chains.

The new Lansden models, which differ considerably from the old familiar Lansdens with their long side chains, are built with single motor drive to countershaft

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and thence by side chains to the rear wheels. The motor casing is bolted to the jackshaft housing, forming a unit that is rigid and unaffected by vibration. The weight of the motor is carried by a heavy cross member of the frame. The Lansden control lever, which is mounted on the steering wheel column, is provided with means for locking up with a padlock when the car is standing, absolutely preventing the current being turned on.

Bigger Motor in Lippard-Stewart.

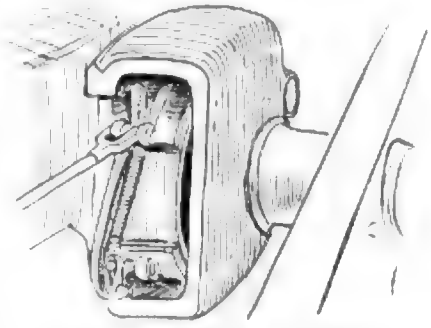
A bigger motor—30 horsepower instead of the former 22 horsepower—is the chief change in the Lippard-Stewart 1,500 pound delivery wagon, though a cone clutch has been substituted for the older disk and the motor and gearcase have been separated into two units. A feature of the exhibit is a hearse—cheerful subject!—which can be converted into a casket wagon by the addition of carved ebony panels to cover the windows and a horizontal partition to provide room for more—well, more load. The Sanford people have experienced a change of heart and abandoned the former two-cycle air-cooled three-cylinder engine for a standard make of four-cycle, four-cylinder water-cooled motor with centrifugal governor. This leaves the Chase truck the sole representative of the two-cycle air-cooled type, and it may be said that the representation is all that could be asked for. The Chase trucks remain practically unchanged, except in the inevitable minor details. The latest and littlest Chase, the 500 pound $500 car, is shown for the first time and attracts its share of attention.

"Assembled" a Standard Talking Point.

"Yes, it's an 'assembled' truck, and that's the best thing you could say about it," is the way the Standard people talk of their vehicle. Built wholly of components made by various specialists, it is a comparatively new machine that is wholly without frills or feathers. The Stegeman, in which a special point is made of fitting removable bronze bushings at every point where wear occurs, so that lost motion can be taken up easily and cheaply, also goes over without anything new. The Durable Dayton is another machine the makers of which take pride in pointing to the fact that the component parts are purchased and assembled into complete cars; and it also is an unchanged machine. The 1,500 pound and 1 ton Sullivan machines have heavier axles and are generally strengthened; the brakes are bigger and the gearcase and jackshaft have been brought together in unit form. Otherwise they are the same sturdy machines.

Detail improvements have been made in a number of machines which, however, retain all their well-known features intact and, in fact, are to all intents and purposes exactly as they were. The Sternberg, Atterbury, Modern, the Koehler, remain up-to-date without necessity for "tinkering."

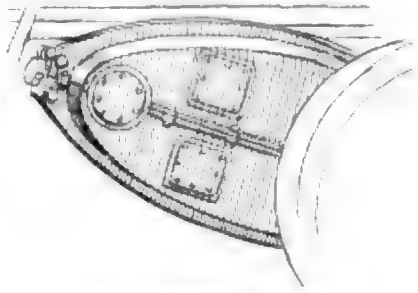
A post entry, so to speak, was that of the Harwood-Barley Mfg. Co., of Marion, Ind., builders of the Indiana truck. The



WALTER ENCLOSED BRAKE

complete line consists of three machines—1½ tons, 2 tons and 3 tons capacity respectively; of these the two smaller are shown. The chief characteristics of these trucks are unchanged. The I H C cars, which are designed especially with a view to simplicity and ease of operation—which naturally includes durability, the lack of which would make the matter of operation a difficult one—are shown in horizontal water-cooled motors only, though several air-cooled models are built.

Though a number of slight changes have been made in the Grand Rapids Motor



BAKER CHAIN CASE

Truck Company's Decatur truck, the favorite "talking point" of the company's representatives is the matter of service. Arrangements have been made to have every owner of a Decatur truck visited by an expert once every 30 days, and this man inspects and advises and instructs on mechanical matters as well as helping very materially in other matters in connection with motor trucking.

Fire Apparatus Lends Dash of Color.

No motor truck show would be anything like a motor truck show if it did not include something striking in the way of motor-driven fire apparatus; and this touch of the spectacular is furnished at the Palace by the Webb Co., of Allentown, Pa., which exhibits a big pumping engine with a six-cylinder motor under the forward hood for driving the car and the pumps, and also a combination chemical and hose wagon with a four-cylinder motor. In the pumping engine the pumps are located back of the driver's seat, and power is transmitted to them through the same mechanism that drives the rear wheels. The Croce exhibit also includes a combination chemical wagon that looks extremely well able to stand the hard service to which such machines are subjected.

There is nothing new, of course, in the use of auxiliary springs designed to come to the assistance of the main rear springs of a truck when the load is in place; but there is an increasing tendency to fit these springs to trucks, and a number of examples of different types are in evidence. The Alco presents a good example of the inverted semi-elliptic spring clipped to a cross-member of the frame directly over the rear axle; the ends of the spring are clear of the axle when there is no load on the truck, and when the load is on they come down and rest on pads clipped to the axle just inside the main spring clips.

Prevalence of Auxiliary Springs.

Spiral springs are even more in evidence for this class of service. B. A. Gramm uses a single cylindrical coil on each side of the truck, resting in a socket on the rear axle, a bracket on the main frame coming down in the top of the coil when the truck is loaded. Selden also uses a single cylindrical coil which, however, is directly under the frame, which rests on the spring when under load. In the case of the Hupmobile the arrangement is the same as in the B. A. Gramm, except that the spring is of large diameter in the middle, tapering toward the ends. Peerless uses a conical coiled spring, with the small end up. In the case of the Lauth-Juergens there are two springs on each side, cylindrical coils, resting on the main spring clips; the upper bearings consist of hooded brackets riveted to the main frames.

In the Rowe exhibit there is a truck fitted with pneumatic cushions—the Klenke pneumatic suspension. Air cushions of fabric-and-rubber are interposed between the spring ends and their brackets, so that the weight comes directly on the cushions and the whole car is suspended on air. Curved plates press on the cushions, and the curvature is so worked out that the pressure per square inch of plate surface is at all times equal, regardless of the air pressure in the cushions, which are pumped up in the usual manner through a tire valve.

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Summary of Trucks Comprising New York Show and Their Price Ranges

In the Garden.

American Locomotive Co., Providence, R. I.—Four Alco trucks: One 2-ton, two 3½-ton, and one 5-ton; one each 2- and 3½-ton chassis. Price range $3,160-$5,525.

Autocar Co., Ardmore, Pa.—Ten Autocar two-cylinder opposed Autocar trucks; one chassis. Price range: Chassis, $2,000; bodies from $275 to $750 extra.

Buick Motor Co., Flint, Mich.—Two Buick trucks, both 1,000 pounds capacity: One each open and panel delivery; one chassis. Price range, chassis, $975-$1,100.

Federal Motor Truck Co., Detroit, Mich.—Three Federal trucks, all one-ton capacity: One each express, panel delivery and combination chemical and hose; one chassis. Price range: Chassis, $1,600; bodies from $100 to $150 extra.

Garford Co. Elyria, Ohio—Eight Garford trucks: One each 3-ton furniture, mail, express and tank trucks, one 5-ton brewery truck, one each 6-ton power dump and coal trucks, one 12-ton tractor-trailer on 5-ton chassis; one 6-ton chassis. Price range, chassis, $2,850-$4,850.

General Motors Truck Co., Pontiac, Mich.—Four G M C trucks: One 1¼-ton, two 3½-ton trucks and one 5-ton dump truck; one each 2-, 3½ and 5-ton chassis. Price range, chassis, $2,075-$3,700.

Gramm Motor Truck Co., Lima, Ohio—One 3-ton Gramm truck and one each 2- and 5-ton chassis; one Willys 1,500-pound delivery wagon. Price range, chassis, $1,750-$4,500; price of Willys, $1,250.

Hupp Motor Car Co., Detroit, Mich.—One Hupmobile 800-pound capacity delivery wagon and one chassis. Price, chassis, $875; with body, $1,075.

International Motor Co., New York City—Five Mack trucks, one Hewitt 10-ton truck, one International 1,500-pound truck and one each 5½- and 7½-ton Saurer chassis. Chassis price range: Hewitt, $1,800-$5,500; Mack, $2,100-$2,300; International, $2,000; Saurer, $5,000-$6,000.

Kelly Motor Truck Co., Springfield, Ohio—Three Kelly-Springfield chassis: One each 1-, 1½- and 3-ton chassis. Price range $2,000-$3,400.

Kissel Motor Car Co., Hartford, Wis.—Four Kissel trucks: One each 3-, 4-, 5-ton and 1,500-pound trucks; one 1¼-ton chassis. Price range, chassis, $1,500-$4,350; bodies $125 to $150 extra.

Knox Automobile Co., Springfield, Mass.—One 3-ton Knox truck and two Martin tractors, one from 5 to 8 tons capacity and the other from 8 to 20 tons capacity. Chassis price range, Martin tractor, $3,250-$3,750; trucks, $3,000-$5,000.

Locomobile Co. of America, Bridgeport, Conn.—Two 5-ton Locomobile trucks: One combination dumping and demountable body truck and one lumber truck with "dead" wagon. Chassis price, $4,800.

Packard Motor Car Co., Detroit, Mich.—Four Packard trucks: One each 3-ton enclosed van and open express and two panel express trucks; one 5-ton chassis. Chassis price range $2,800-$4,500.

Peerless Motor Car Co., Cleveland, O.—Two Peerless trucks: One 3-ton furniture van and one 5-ton dumping truck. Chassis prices $3,700-$4,500.

CENSUS OF THE SHOW

Total Exhibitors		240
Exhibtors of Vehicles	64	
Exhibitors of Accessories	176	
Gasolene—		
One Cylinder	2	
Two Cylinders	18	
Two Cylinders (2-cycle)	3	
Three Cylinders (2-cycle)	2	
Four Cylinders	121	
Six Cylinders	1	
		147
Chassis—		
Two Cylinders	3	
Four Cylinders	48	
Three-wheel Tractors	2	
		53
Total Gasolene Trucks and Chassis		200
Water-cooled	197	
Air-cooled	3	
Electric—		
Trucks	29	
Chassis	6	
Roadster (Pleasure)	1	
		36
Total Vehicles and Chassis		236

Pierce-Arrow Motor Car Co., Buffalo, N. Y.—Two 5-ton Pierce-Arrow trucks: One dumping truck and one stake body truck; one chassis. Chassis price $4,500.

Pope Mfg. Co., Hartford, Conn.—Two Pope-Hartford trucks: One 3-ton stake body truck and one combination chemical and hose wagon; one 5-ton chassis. Price range $3,550-$4,675.

Reo Motor Truck Co., Lansing, Mich.—Two single cylinder Reo delivery wagons and one four-cylinder 1½- to 2-ton truck; one 1½- to 2-ton chassis. Chassis prices, with driver's seat, $700-$1,800.

Selden Motor Vehicle Co., Rochester, N. Y.—Two one-ton Selden trucks: One each express and stake body trucks; one chassis. Chassis price $2,000.

Speedwell Motor Car Co., Dayton, Ohio—Three Speedwell trucks: Two 4-ton open trucks and one 6-ton dumping truck; one 2-ton chassis. Price range, with standard bodies, $2,950-$4,500.

Velie Motor Vehicle Co., Moline, Ill.—One 2-ton Velie truck; one each 1-ton and 3-ton chassis. Chassis price range $1,650-$3,350.

Walter Motor Truck Co., New York City—Two Walter trucks: One 3½-ton furniture van and one Latil drive 2½-ton truck; one 3½-ton chassis. Price range, not including Latil drive chassis, $2,800-$5,000; Latil drive chassis, $3,200.

White Co., The, Cleveland, Ohio—Nine White trucks: One six-cylinder combination chemical and hose wagon and one each four-cylinder ambulance, 1½-ton truck, 1½-ton tower wagon, 1½-ton van, 3-ton truck, 5-ton power dumping truck and two 1,500-pound delivery wagons; one taxicab. Price range $2,250-$4,700.

In the Palace.

Atlantic Vehicle Co., New York City—One 5-ton Atlantic electric chassis. Price, $4,000.

Atterbury Motor Car Co., Buffalo, N. Y.—Four Atterbury trucks: One each 1,500-pound delivery wagon, 1-, 2- and 3-ton trucks. Price range, $1,250-$3,000.

Baker Motor Vehicle Co., Cleveland, O.—Four Baker electric trucks: One each 500-pound delivery and 4-ton truck and two 2-ton trucks; one 1-ton chassis. Price range, $1,800-$3,500.

Bessemer Motor Truck Co., Grove City, Pa.—Two Bessemer trucks: One each 1,000-pound delivery wagon and 1½-ton truck; one each 1,000-pound and 1-ton chassis. Price range, $1,200-$2,700.

Blair Mfg. Co., Newark, O.—One 2½-ton Blair truck; one 3½-ton chassis. Price range, $3,000-$3,750.

Bowling Green Motor Car Co., Bowling Green, O.—One 1,000-pound Modern delivery wagon; one 1,500-pound chassis. Price range, $1,325-$1,625.

Brown Commercial Car Co., Peru, Ind.—Two 1,500-pound Brown delivery wagons; one chassis. Chassis price, $1,650.

Chase Motor Truck Co., Syracuse, N. Y.—Three Chase trucks; One two-cylinder, two-cycle, 500-pound delivery wagon; one each three-cylinder, two-cycle, 1- and 2-ton trucks; all air cooled. Price range, $500-$2,200.

Croce Auto Co., Inc., Asbury Park, N. J.—One Croce 1,500-pound delivery wagon and one combination chemical and hose

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wagon; one each 1,500-pound and 3-ton chassis. Price range, $1,850-$4,500.

Dart Mfg. Co., Waterloo, Ia.—Three Dart trucks: one each four-cylinder, four-cycle, 1,500-pound and 1½-ton trucks and one 1,000-pound, two-cylinder delivery wagon. Price range, $750-$1,790.

Driggs-Seabury Ordnance Corporation, Sharon, Pa.—One 4½-ton Vulcan truck and one 7-ton chassis. Price range, $3,600-$5,600.

Durant-Dort Carriage Co., Flint, Mich.—One each Flint 1,600-pound delivery wagon and chassis and one two-cylinder Best 1,000-pound chassis. Price, Flint, $875; Best, $840.

Dayton Auto Truck Co., Dayton, O.—One 3-ton Dayton chassis. Price range, $2,650-$4,500.

General Vehicle Co., Long Island City, N. Y.—Eight General Vehicle electric trucks: One each 1,000-pound, 1-ton, battery crane and industrial, 3- and 3½-ton trucks, two 5-ton trucks; one chassis.

Two G M C electric trucks: One each 1,000-pound and 5-ton; one each 1- and 3-ton chassis. Price range, $2,075-$3,700.

Gramm-Bernstein Co., Lima, O.—One Benjamin A. Gramm 2-ton truck and one 3½-ton chassis. Price range, $2,750-$3,600.

Grand Rapids Motor Truck Co., Grand Rapids, Mich.—Two 1½-ton Decatur delivery wagons. Price range, $2,200-$2,500.

Harwood-Barley Mfg. Co., Marion, Ind.—Two Indiana trucks, one each 1½- and 2-ton trucks. Price range, $2,000-$3,200.

Hydraulic Truck Sales Co., New York City—One 6-ton La France truck with Manly hydraulic drive.

International Harvester Co.—Three I H C two-cylinder, 1,500-pound delivery wagons; one chassis. Price, air-cooled, $820; water-cooled, $935.



STUDEBAKER PALACE EXHIBIT WITH NEW GASOLENE TRUCK IN CENTER

Koehler Sporting Goods Co., H. J., New York City—Two two-cylinder, 1,600-pound delivery wagons; one chassis. Price range, $750-$900.

Krebs Commercial Car Co., Clyde, O.—Three Krebs trucks: One each two-cylinder, two-cycle, 1,500-pound and 1-ton trucks, and one four-cylinder, four-cycle 1½-ton truck. Chassis price, $1,375.

Lansden Co., Newark, N. J.—Six Lansden electric trucks: One each 1-ton gas wagon, 750-pound delivery wagon, 1,000-pound ambulance, two 1-ton trucks; one 3½-ton chassis.

Lauth-Juergens Motor Car Co., Fremont, O.—Three Lauth-Juergens chassis, one each 1-, 3- and 5-tons. Price range, $1,950-$3,300.

Lippard-Stewart Motor Car Co., Buffalo, N. Y.—Four Lippard-Stewart 1,500-pound trucks: One each hearse and undertaker's wagon and two delivery wagons; one chassis. Price, $1,650.

Maccarr Co., Allentown, Pa.—One 1,500-pound Maccarr truck; one chassis. Price range, $1,650-$1,900.

Mais Motor Truck Co., Indianapolis, Ind.—One 2½-ton Mais chassis. Price range, $2,750-$3,400.

Rowe Motor Mfg. Co., Coatesville, Pa.—Two Rowe trucks: One each 1- and 2-ton trucks. Price range, $1,800-$4,800.

Sanford Motor Truck Co., Syracuse, N. Y.—One 1-ton Sanford truck and one chassis. Chassis price, $1,600.

Schacht Motor Car Co., Cincinnati, O.—Two Schacht trucks: One each 1,800-pound delivery wagon and 3-ton truck. Price range, $1,600-$3,300.

Service Motor Car Co., Wabash, Ind.—Four Service trucks: Two 1-ton express trucks, one each 1½- and 3-ton trucks; one 1½-ton chassis. Price range, $1,350-$1,675.

Smith Co., A. O., Milwaukee, Wis.—Two Smith-Milwaukee chassis: One each 3½- and 6-ton chassis. Price range, $3,750-$4,750.

Standard Motor Truck Co., Detroit, Mich.—One 3-ton Standard truck; one chassis. Chassis price, $2,750.

Sternberg Mfg. Co., Milwaukee, Wis.—Two Sternberg trucks: One each 3- and 4-ton; one 5-ton chassis. Prices, $2,800-$4,500.

Stewart Motor Corporation, Buffalo, N. Y.—Three Stewart 1,500-pound delivery wagons; one chassis. Chassis price, $1,650.

Studebaker Corp., Detroit, Mich.—Two Studebaker gasolene trucks and three electric trucks: One each gasolene 1,000-pound and 3-ton; one each electric 1,000-pound, 1-ton and 1½-ton. Price range, eelctric, $1,500-$3,000; gasolene, $850-$3,000.

Sullivan Motor Car Co., Rochester, N. Y.—



LAUTH-JUERGENS DISPLAY AS IT IS ARRANGED IN THE PALACE



FEDERAL EXHIBIT ON THE GARDEN ELEVATED PLATFORM OVERLOOKING THE "ARENA"

Two two-cylinder Sullivan trucks: One each 1,000-pound and 1,500-pound. Price range, $925-$950.

Universal Motor Truck Co., Detroit, Mich.—Two Universal trucks: One each 1-ton and 3-ton; one chassis. Price range, $2,750-$3,400.

Ward Motor Vehicle Co., New York City.—Three Ward electric trucks: One each 1-, 2- and 4-ton trucks; one 1,000-pound chassis.

Waverley Co., Indianapolis, Ind.—Two Waverley electric trucks: One each 1,000-pound delivery and 5-ton truck; one chassis; and one roadster pleasure car. Price range $1,800-$4,000.

Webb Co., Allentown, Pa.—Two Webb fire apparatus vehicles: One 6-cylinder combined pump, chemical and hose wagon and one four-cylinder combined chemical and hose wagon.

Truck Tire Development Disclosed in Accessory Department

In the matter of accessories, but little that is new, and only one that approaches the radical was revealed by the shifting of the scenes. One new cast steel wheel makes its appearance, the product of the Johnson Steel Wheel Corporation, Boston. In common with the several steel wheels which cropped out during the first week, Johnson wheels are cast with hollow oval spokes by way of reducing weight to a minimum and eliminating strains due to unequal cooling. Spokes, rim, hub, brake drum and seat for the driving sprocket are cast integral and all machine work is done at one setting of the boring mill, resulting in a perfectly concentric finished product. For lighter trucks, the rims also are cast hollow. The wheels are made of crucible steel alloyed with vanadium and titanium, acid open hearth steel or electric refined steel, according to conditions.

It is in the tire line that a near-radical article appears—the Pioneer steel block tire, exhibited by the Pioneer Steel Block Tire Co., St. Louis, Mo. As the designation would imply, the tire is made up of a series of steel blocks similar to the rubber blocks on the ordinary block tire construction and with the ends cut off at an angle by way of eliminating bumps at the intersections. The blocks are cast hollow and are mounted on a heavy rubber pad which covers the periphery of the wheel so that shocks are transmitted through the blocks to the rubber and absorbed. By way of eliminating the slight shocks, a pair of helical springs is placed in the hollow of each block and arranged to operate against a plate which rests upon the rubber pad. The tire is retained in place on the wheel by a pair of flanged rings which are bolted to the wheel rim, the flanges gripping opposing flanges cast on the base of the blocks. Both single and dual equipment are made.

New in the truck tire line is the Standard block tire just announced by the United States Tire Co. In its simplest aspect, the tire embraces the use of a double flange band which slips over the felloe and separates the two series of blocks, and two dozen flange plates which bolt to the wheel

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felloe and engage with the similar projections on the base of the blocks and serving to keep the blocks in place. Two bolts pass through each plate and clear through the wheel rim to the other side. Naturally the blocks are staggered when in position with a consequent elimination of bumps when in use on smooth pavements, and as a matter of course the flange plates are staggered with relation to each other in the same manner, so that by loosening two bolts and prying the flange plate away from the block, any of the blocks can be quickly and easily removed.

Of totally different design, yet embodying the accessibility feature, in that any of the blocks can be removed simply by the removal of two bolts, is the new block truck tire made by the Republic Rubber Co. In the Republic design the blocks are supported by plates which bolt to the periphery of the wheel, the blocks protruding through suitable holes in the plates which, when in place, clamp against the base flanges. Each plate serves to hold two blocks, one on either series, so that the plates assume a zig-zag shape. The two bolts which clamp the plates to the periphery of the wheel are positioned between the blocks. Also new in the Republic line is a non-demountable wireless tire, of which a feature is a semi-hard base.

Soft base, side flange clincher types of solid rubber tires, designed for use in connection with Q. D. rims as ordinarily supplied for pneumatic tire use, are shown by the Goodyear Tire & Rubber Co. By way of rendering the tires durable, reinforcement in the shape of short wires which are laid diagonally across near the base is employed, and in order that creeping, which naturally would cause excessive wear, will not occur, the base is formed so that the distance between flanges is slightly in excess of the width of the rim. When bolted into position the tire is compressed and creeping is impossible. For especial use with fire-fighting apparatus the Goodyear company has brought out a demountable cushion tire of the Motz type, which, it is claimed, is very nearly as resilient as the penumatic tire and equally as economical of power, and, moreover, by virtue of the cavities cut in the periphery is valuable as an anti-skid. In common with the soft base tires, it is put out in widths of from 3 to 6 inches and in diameters to meet all requirements.

V. C. tires are the products which mark the entrance of the Pennsylvania Rubber Co. into the commercial vehicle field. They are of the demountable type, provided with steel bases, and are made in carrying capacities from 950 to 4,000 pounds for single tires and from 2,500 to 10,000 pounds for duals.

A continuous base block tire, flanged for attachment to Q. D. rims, is offered by the Swinehart Tire & Rubber Co. The tire comprises a soft base with the blocks vulcanized in place; creeping is prevented by making the base slightly oversize so that the tire is clamped tightly in place. The Firestone Tire & Rubber Co. also is exhibiting a soft base tire for use on clincher rims, the base being reinforced with diagonal wires, and a cushion tire for use with light commercial vehicles.

One type of tire grip not covered by the Motor World's Before Shows issue is on view, the product of the Lyon Non-Skid Co., Philadelphia, Pa. The device is intended for use only on solid tires and comprises three sections which are attached to each other by means of pins to form a rigid body which will not shift on the tire. That portion of the grip which comes in contact with the tread has been rounded off by way of reducing wear on the tire to a minimum; flexible alloy steel enters into the construction, so that the device will not cause bumps when the wheel is traveling over smooth roads. Attachment is by means of three taper split pins which are placed from in front of the wheel; a turn buckle for tightening the grip on the tire before the last pin is inserted forms part of the equipment.

The Travelog is the latest addition to the very many truck recorders on the market. It comprises an eight-day jewelled Howard clock mounted in a pressed steel case which is positioned on the dash and designed to cause a graduated chart to rotate once every 24 hours. Naturally, the record disk is graduated with a scale representing the hours. Contacting with the chart is a styllus operated by a very sensitive pendulum; when the pendulum is set in motion by the vibration of the vehicle, the styllus traces lines which take the direction of the radii of the disk, and since the movement of the disk is relatively slight as compared with the more or less rapid vibration



CORNER OF THE ELEVATED PLATFORM IN THE GARDEN WITH THE FISK TIRE EXHIBIT IN THE FOREGROUND

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of the pendulum, the tracings assume the form of bands of various widths, according to the amplitude of vibration of the pendulum. When the motor is stationary, the stylus traces a spiral path starting at the periphery of the disk and traveling toward the center, so that a single chart can be used for a week without interference of the tracings. The varying width of the tracings records the movements of the truck. Naturally the device is sealed against tampering by the driver and is put out in two forms—with a glass case cover and with a pressed steel cover. The device is made by W. H. Brown of Cleveland, Ohio.

Summary of Accessory Exhibits at New York Truck Show

* Denotes exhibit in Palace; ** in both buildings; undesignated, in Garden.

Ajax-Grieb Rubber Co., New York City—Ajax tires.

American Kushion Kore Tire Co., New York City—Tire fillers.*

American Metal Hose Co., Waterbury, Conn.—Flexible metal pipe.*

American Ball Bearing Co., Cleveland, Ohio—American axles and worm gearing.

American Tire & Rubber Co., Akron, Ohio—American inner tubes.*

American Spring Wheel Co., Nashville, Tenn.—Seaton spring wheels.

American Taximeter Co., New York City—Jones and Popp taximeters and Specograph truck recorders.

Aristes Co., New York City—Mondex shock absorbers, Magic motors and gearsets.

Automobile Supply Mfg. Co., Brooklyn, N. Y.—Newtone signals.

Badger Brass Mfg. Co., Kenosha, Wis.—Solar lamps.

Baldwin Chain & Mfg. Co., Worcester, Mass.—Baldwin chains.

Baldwin Steel Co., New York City—Baldwin steels.

Barthel, Daly & Miller, New York City—Schaefer ball bearings.

Benford Mfg. Co., Mt. Vernon, N. Y.—Monarch plugs and headlight lighters.

Bower Roller Bearing Co., Detroit, Mich.—Bower roller bearings.

Bowser & Co., S. F., Ft. Wayne, Ind.—Fuel pumps and storage systems.

Braender Rubber & Tire Co., Rutherford, N. J.—Braender tires.

Briggs Magneto Co., Elkhart, Ind.—Briggs magnetos and lighting systems.

Brown, W. H., Cleveland, Ohio—Travelog truck recorders.

Brown-Lipe Gear Co., Syracuse, N. Y.—Brown-Lipe gears and gearsets.

Buda Co., Harvey, Ill.—Buda motors and gearsets.**

Budd Mfg. Co., Edward G., Philadelphia, Pa.—Pressed steel bodies.

Bullard Machine Tool Co., Bridgeport, Conn.—Machine tools.

Byrne, Kingston & Co., Kokomo, Ind.—Kingston carburetters.

Carnegie Steel Co., Pittsburgh, Pa.—Steels.

Champion Ignition Co., Flint, Mich.—A-C spark plugs.

Chicago Drop Forge & Foundry Co., Chicago, Ill.—Drop forgings.

Coes Wrench Co., Worcester, Mass.—Wrenches.

Connecticut Telephone & Electric Co., Meriden, Conn.—Connecticut shock absorbers, magnetos and ignition devices.

Cooks Sons, Adam, New York City—Albany grease and lubricating oils.

Cotta Transmission Co., Rockford, Ill.—Cotta gearsets.

Cramp & Sons Ship & Engine Bldg. Co., Wm., Philadelphia, Pa.—Parsons's white brass and bronze bearing metals, bearings and worm gears.**

Dean Electric Co., Elyria, Ohio—Tuto and Rexo signals, Dynalux electric lighting systems, Otho and Elyria-Dean electric lighting and starting systems, Hi-Fre-Co ignition systems.*

Diamond Chain & Mfg. Co., Indianapolis, Ind.—Diamond chains.

Dixon Crucible Co., Jos., Jersey City, N. J.—Graphite lubricants.

Duplex Gasolene Motor Co., New York City—Two-stroke motors.

Edmunds & Jones Mfg. Co., Detroit, Mich.—Lamps.

Electric Storage Battery Co., Philadelphia, Pa.—Exide storage batteries.

Englebert Tire Co., New York City—Tires.

Eureka Non-Skid Mfg. Co., Brooklyn, N. Y. Non-skid devices.

Everland Eng. & Mfg. Co., Philadelphia—Machine tools.

Fairbanks Co., New York City—Machine tools.

Favary Tire & Cushion Co., New York City—Favary cushion tires.

Federal Chain & Mfg. Co., Springfield, Mass.—Federal non-skid devices.

Findeisen & Kropf, Chicago, Ill.—Rayfield carburetters.

Fischer Steel & Iron Works Co., Switzerland—Fischer steels.

Firestone Tire & Rubber Co., Akron, Ohio—Firestone tires.

Fisk Rubber Co., Chicopee Falls, Mass.—Fisk tires.

Fletcher & Co., L. V., New York City—American Locomotive carburetters.

Frasse, Peter, New York City—Fischer steels.

Gabriel Horn Mfg. Co., Cleveland, Ohio—Gabriel horns and rebound snubbers.

Gasolene Filter Co., New York City—Perfect gasolene filters.

Garvin Machine Co., New York City—Machine tools.

Gemmer Mfg. Co., Detroit, Mich.—Gemmer steering gears.

General Rim Co., New York City—Rims.

Gibney Rubber Co., J. L., Philadelphia, Pa.—Tires and vulcanizers.

Globe Machine & Stamping Co., Cleveland, Ohio—Steel tool boxes, metal hampers, fenders and sheet metal parts.

General Electric Co., Schenectady, N. Y.—Electric motors, rectifiers, etc.

Goodrich Co., B. F., Akron, Ohio—Goodrich tires.

Goodyear Tire & Rubber Co., Akron, Ohio—Goodyear tires.

Gould Storage Battery Co., New York City—Gould batteries and Duplex lighting and ignition system.*

Gray & Davis, Amesbury, Mass.—Lamps and electric starting and lighting systems.**

Haedge & Richter, Hanover, Germany—Rivets and riveting machines.*

Harris Oil Co., A. W., Providence R. I.—Lubricants.

Hartford Suspension Co., Jersey City, N. J.—Truffault-Hartford shock absorbers, Hartford electric starting and lighting systems and jacks and bumpers.**

Havoline Oil Co., New York City—Havoline lubricants.

Hess-Bright Mfg. Co., Philadelphia, Pa.—Hess-Bright ball bearings.

Hess Steel Castings Co., Bridgeton, N. J.—Steel castings.*

Heinze Electric Co., Lowell, Mass.—Magnetos and coils.

Hesey-Wolf Machine Co., Cincinnati, Ohio—Machine tools.

Hoffman Co., George W., New York City—Metal polishes.*

Homo Co. of America, Philadelphia, Pa.—Homo carburetters.**

Hyatt Roller Bearing Co., Newark, N. J.—Hyatt flexible spiral steel roller bearings.

Haupert Machine Co., New York City—Machine work.

International Accessories Mfg. Co., New York City—A. B. C. carburetters.

Ingersoll-Rand Co., New York City—Pumps.*

Janney-Steinmetz & Co., Philadelphia, Pa.—Cold drawn, seamless steel tanks.

Johnson Steel Wheel Corp., Boston, Mass.—Steel wheels.

Jones & Co., Phineas, Newark, N. J.—Wood wheels.

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Kahnweiler Sons, David, New York City—Simplex fire extinguishers.

Kells Mfg. Co., W. J., New York City—Radiators.

Kent Mfg. Works, Atwater, Philadelphia, Pa.—Unisparker ignition systems and Monoplex horns.

Kelly-Springfield Tire Co., New York City—Kelly-Springfield tires.

K-W Ignition Co., Cleveland, Ohio—K-W magnetos and coils.

Leeds & Northrup Co., Philadelphia, Pa.—Pyrometers and testing instruments.*

Lees-Bradner Co., Cleveland, Ohio—Machine tools.

Model Gas Engine Works, Peru, Ind.—Model motors.

Mosler & Co., A. R., Mount Vernon, N. Y.—Spitfire spark plugs and Umph timers.*

Motometer Co., New York City—Motometer temperature indicator.

Motsinger Devices Mfg. Co., Pendleton, Ind.—Autosparkers and carburetters.

Motz Tire & Rubber Co., Akron, Ohio—Motz cushion tires.

Muncie Gear Works, Muncie, Ind.—Gears, wheels and gearsets.**

National Rubber Co., St. Louis, Mo.—Tire preservative.**

Perfection Spring Co., Cleveand, Ohio—Krupp steel springs.

Philadelphia Storage Battery Co., Philadelphia, Pa.—Philadelphia batteries.*

Pioneer Steel Block Tire Co., St. Louis, Mo.—Pioneer tires.

Polack Tire Co., New York City—Polack tires.

Potter & Johnston Mch Co., Pawtucket, R. I.—Machine tools.

Prosser & Son, Thos., New York City—Krupp steels.

Randall-Faichney Co., Boston, Mass.—Jericho and Jubilee exhaust horns, muffler cut-outs, B'Line grease guns, Jericho gas



GOODYEAR EXHIBIT ON GARDEN ELEVATED PLATFORM WITH GRAY & DAVIS DISPLAY IN BACKGROUND

Lefevre Arms Co., Syracuse, N. Y.—Lefevre gearsets.

Light Mfg. & Foundry Co., Pottstown, Pa.—Aluminum parts and castings.

Lindhe Shim Co., Brooklyn, N. Y.—Bearing shims.

Link Belt Co., Philadelphia, Pa.—Silent chains.

Lyon Non-Skid Co., Philadelphia, Pa.—Lyon grips.

Marburg Bros., Inc., New York City—Mea magnetos, S. R. O. bearings.

Manufacturers Foundry Co., Waterbury, Conn.—Castings.

McCord Mfg. Co., Detroit, Mich.—Radiators, lubricators, fans and McKim gaskets.

Merchant & Evans Co., Philadelphia, Pa.—Hele Shaw clutches, gearsets, Star tire cases.

Mosler, Chas. E., New York City—Brampton chains, Pan-American oils, Miller plugs.

National Tube Co., Pittsburg, Pa.—Seamless steel tubing.

Never Skid Mfg. Co., New York City—Anti-skid devices.

New Departure Mfg. Co., Bristol, Conn.—New Departure ball bearings.

Newmastic Tire Co., New York City—Newmastic tire filler and demountable rims.**

New Miller Carburetter Co., Indianapolis, Ind.—New Miller carburetters.

New York & New Jersey Lubricants Co., New York City—Columbia lubricants.

Norma Co. of America, New York City—Norma ball bearings.*

North East Electric Co., Rochester, N. Y.—North East electric lighting and starting systems.

Overman Tire Co., New York City—Overman tires.

Peacock, Clarence H., New York City—Ames shock absorbers.

Pennsylvania Rubber Co., Jeannette, Pa.—Pennsylvania tires.

regulators, Webster tank gauges and other sundries.

Remy Eectric Co., Anderson, Ind.—Remy magnetos and lighting systems.

Republic Rubber Co., Youngstown, Ohio—Republic tires.

Rhineland Machine Works Co., New York City—Rhineland bearings.

Rich Tool Co., Chicago, Ill.—Tools and tungsten valves.*

Riker, Malcolm D., New York City—Transportation expert.*

Rose Mfg. Co., Philadelphia, Pa.—Neverout lamps, license brackets, and heaters.

Ross Gear & Tool Co., Lafayette, Ind.—Tools.*

Royal Equipment Co., Bridgeport, Conn.—Duplex and Raymond brakes, Raybestos brake linings, Gyrex mixers.

Sarco Engineering Co., New York City—Coventry chains.

Schrader's Sons, Inc., A., New York City—

Universal tire valves and pressure gauges.

Schwartz Wheel Co., Philadelphia, Pa.—Wood wheels.

Service Recorder Co., Chicago, Ill.—Truck recorders and hub odometers.

Sewell Cushion Wheel Co., Detroit, Mich.—Cushion wheels.

Sheldon Axle Co., Wilkes-Barre, Pa.—Axles and springs.

Simms Magneto Co., New York City—Simms magnetos.**

Smith Co., A. O., Milwaukee, Wis.—Parts.

Spicer Mfg. Co., Plainfield, N. J.—Spicer universal joints.

Splitdorf Electrical Co., Newark, N. J.—Splitdorf magnetos, coils, plugs and other ignition devices, also electric lighting systems.*

Standard Roller Bearing Co., Philadelphia, Pa.—Standard ball and roller bearings.

Standard Welding Co., Cleveland, O.—Stanweld rims and parts.

Stewart & Clark Mfg. Co., Chicago, Ill.—Stewart speedometers.

Stromberg Motor Devices Co., Chicago, Ill.—Stromberg carburetters.

Sunderman Safety Carburetter Co., Newburgh, N. Y.—Sunderman carburetters.

Suspension Roller Bearing Co., Sandusky, Ohio—Suspension roller bearings.

Swinehart Tire & Rubber Co., Akron, Ohio—Swinehart tires.

Texas Co., New York City—Texaco lubricants.*

Timken-Detroit Axel Co., Detroit, Mich.—Timken hollow cast steel wheels and bevel and worm axles.**

Timken Roler Bearing Co., Canton, Ohio—Timken taper roller bearings.**

Torbenson Gear & Axle Co., Newark, N. J.—Axles.

Townsend & Co., Orange, N. J.—Townsend grease guns.**

Turner Brass Works, Sycamore, Ill.—Tire pumps, brazing apparatus, motor cleaners.

Tyer Rubber Co., Andover, Mass.—Tyrian tires.*

United States Gauge Co., New York City—Tire gauges.

United States Light & Heating Co., New York City—U. S. L. starting and lighting systems and storage batteries.**

U. S. Tire Co., New York City—United States tires.

Vacuum Oil Co., New York City—Mobil oils and greases.

Valentine & Co., New York City—Varnishes.

Veeder Mfg. Co., Hartford, Conn.—Veeder tachometers, odometers and die cast parts.

Vesta Accumulator Co., Chicago, Ill.—Vesta storage batteries and lighting systems.

Warner Gear Co., Muncie, Ind.—Gears and parts and Gardner engine starters.**

Warner Mfg. Co., Toledo, Ohio—Gearsets.

Warner Instrument Co., Beloit, Wis.—Warner autometers.*

Weed Chain Tire Grip Co., New York City—Weed chains.

Wells Bros. Co., Greenfield, Mass.—Screw cutting tools.*

Western Electric Pittsfield Co., Pittsfield, Mass.—Pittsfield magnetos, coils, timers, etc.

Wasson Piston Ring Co., Hoboken, N. J.—Piston rings.

West Side Y. M. C. A., New York City—Instruction.

Weston-Mott Co., Flint, Mich.—Axles and parts.

Westinghouse Electric & Mfg. Co., Pittsburgh, Pa.—Motors, starting and lighting outfits, vulcanizers, horns, etc.*

Wheeler & Schebler, Indianapolis, Ind.—Schebler carburetters.**

Whitney Mfg. Co., Hartford, Conn.—Whitney chains.

Willard Storage Batttery Co., Cleveland, Ohio—I.BA storage batteries.

Williams Co., J. H., Brooklyn, N. Y.—Drop forgings and wrenches.

Willey Co., Long Island City, N. Y.—Paints and colors.

Wolverine Lubricants Co., New York City—Wolverine lubricants.

Young, O. W., Newark, N. J.—Lubricants, tire repair outfits.

Detroit to Have an Automobile Laundry.

Automobile Laundry is the style of a company which just has been organized under Michigan laws with an authorized capital of $10,000 and the character of which is only indirectly suggested by its title. The laundry work which it will perform will be the washing and polishing of automobiles and the cleaning of engines by compressed air. The incorporators of the company, which will locate at 1221-29 Woodward avenue, Detroit, are Lew F. McCutcheon, Herbert F. Nelson and Frank D. McCormack. The system which will be applied provides for the entrance at one door of a dirty car which, after making a complete circuit of the laundry, will make its exit through another door in spick and span condition, the process requiring only 15 to 20 minutes, different crews of men being employed.

Big Automobile Building at 'Frisco Fair.

To house the exhibits of automobiles and accessories which will form a part of the Pacific-Panama Exposition in San Francisco in 1915, the National Association of Automobile Manufacturers has arranged for the erection of a special automobile building, 300 x 600 feet, or about four times as large as Madison Square Garden, New York, or the Coliseum in Chicago. It is the intention to throw open the building not merely to American cars, motorcycles and accessories, but to invite foreign manufacturers to share the structure, instead of exhibiting in the Transportation Building, as originally planned.

$100,000 for a Gasolene Alternative.

By way of spurring inventors and chemists and others on to the perfection of an alternate fuel that shall be cheaper than gasolene while retaining all its advantages, it was decided at the last meeting of the International Association of Recognized Automobile Clubs, held in Paris, to offer a prize of $100,000 to any one, irrespective of nationality, successfully solving the problem. In order to obtain the prize money a world-wide fund will be opened. A special organizing committee, with Baron de Kuylen de Nyvelt as chairman, was appointed.

Stern Punishment for Drunken Drivers.

The Fitzgerald bill, designed to make harder the way of the drunken chauffeur in New York, is now a law. It was signed by Governor Sulzer on Thursday last, 16th inst., and was, indeed, the first measure to which the new executive attached his signature. It imposes a penalty of a year's imprisonment, or a fine of $500, or both, upon any person driving a motor vehicle while intoxicated.

Paris Show Advanced to October.

With the success of the recent French show marred only by the fact that it came at a time when manufacturers were busy with preparations for the coming season, and it therefore interfered slightly with the work, it has been decided to eliminate future trouble of the kind by the simple expedient of holding the show earlier; the next French show is scheduled for October, 1913. It is hoped by shifting the date, which thus brings the French show ahead of the British one, to increase the number of exhibits by staging the show at a time when factories are less pushed.

Show Indicator that Directed Visitors.

At the recent Paris show there was employed a clever device which might work well at an American show or at any other show, for that matter. In its simplest aspect, it consisted of a floor plan of the exhibition hall on ground glass with the exhibition spaces plainly marked on it. Beneath the plan, which normally was dark, there were alphabetically arranged a row of buttons, one for each exhibitor. To determine the location of any exhibit merely required that the exhibitor's button be pressed, thus illuminating a miniature electric lamp behind the position of the exhibitor's space on the ground glass.

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57 Dealers Stage 68 Car Exhibits in Philadelphia

Evidently those who had to do with the staging of the twelfth annual show of the Philadelphia Automobile Trade Association, which opened on Saturday evening last, 18th inst., in the garage building of the Automobile Club of Philadelphia, believe that an automobile exhibit is meant primarily for the exploitation of motor cars and accessories, and not of the decorations, or else the building did not readily lend itself to ornamentation; at any rate, scenic panels which serve to cover the walls was the chief form of embellishment attempted. As was the case last year, the doors will swing wide for two weeks, the space being devoted to the exhibition of commercial vehicles during the second week.

Three floors of the mammoth building are needed adequately to display the 68 different automobile exhibits which are shown by 57 dealers. The accessory dealers, 25 strong, come into their own on the top floor. The full list of motor car exhibitors is as follows:

American Automobile Co., American and Speedwell; Automobile Co. of Philadelphia, Marmon; Bergdoll Motor Co., Bergdoll; Detroiter Phialdelphia Co., Detroiter; Fiat Automobile Co., Fiat; Jackson-Stutz Sales Co., Jackson and Stutz; Thomas B. Jeffery Co., Rambler; Krit Motor Car Co., Krit; Longstreth Motor Car Co., Alco; Mitchell Motor Co., Mitchell; North Philadelphia Auto Station, Knox; Oldsmobile Co. of Pennsylvania, Oldsmobile; Overland Motor Co., Overland; Regal Sales Organization, Regal; Padula Motor Co., Havers; R. C. H. Corp., R. C. H. and Hupp-Yeats electric; Standard Motor Car Co., Velie; J. H. Schumacker Co., Dorris; Wallace Auto Co., Pope-Hartford; Automobile Sales Corp., Cadillac; J. C. Bartlett, Woods and Detroit electrics; Cartercar Motor Co., Cartercar; Gawthorp & Wister, Pathfinder; D. Walter Harper, Case; Imperial Automobile Co., Imperial; General Motor Car Co., Lozier, Paige and Rauch & Lang electric; Carroll A. Haines & Co., Baker electric and Herreshoff; E. C. Johnston Co., Premier and Reo; Johnston Motor Car Co., Haynes and Henderson; Locomobile Co. of America, Locomobile; Kissel Motor Car Co., Kissel; Peerless Motor Car Co., Peerless; Stanley Motor Car Co., Stanley; Thorntonfuller Auto Co., Simplex and S. G. V.; White Co., White; Winton Motor Co., Winton; Buick Motor Co., Buick; Chalmers Motor Car Co., Chalmers; Eldridge Co., Garford; Ford Motor Co., Ford; Foss-Hughes Co., Pierce-Arrow; Gomery-Schwartz Motor Co., Hudson; Oakland Motor Co., Oakland; Michigan Motor Co., Michigan; Packard Motor Co., Packard; F. B. Stearns Co., Stearns; A. G. Spalding & Bro., Stevens-Duryea; Studebaker Corp., Studebaker; Whiting Motor Co., Mercer; Cole Motor Co., Cole; Touraine Co., Touraine; United Motor Philadelphia Co., Flanders and Maxwell; Sweeton Auto Co., Franklin; Edwards Motor Car Co., Edwards; Carter Car Co., Metz; Liberty Motor Car Co., Apperson and Palmer-Singer.

Toledo Show Twice as Large as 1912 Function

If the size of the annual automobile show can be construed as an indication of the trade conditions in a locality, and it seems perfectly plausible for such to be the case, then Toledo, Ohio, has resorted to the use of "seven league boots," figuratively speaking, with regard to automobile matters, since the closing of the third annual show of the Toledo Auto Shows Co., which was staged last winter, and the opening on Monday evening last, 20th inst., of the fourth exhibit in the Terminal Building. Exhibits and exhibitors are very nearly twice as numerous as was the case in 1912, and, as a matter of course, in order adequately to take care of the greater number, floor space has been doubled; the present exhibit is housed in both of the exposition halls. In all there are 52 products, both pleasure and commercial, of as many different factories displayed by some 29 dealers; accessories are exhibited by 17 supply dealers.

In the matter of decorations, both rooms have been transformed into Southern gardens. Palms mark the aisles and bound the booths, green carpet in semblance of grass, as a matter of course, covers the floor, and from the green and white and blue and white draperies which hide the ceilings in either hall, dangle very many flower-bedecked electric light globes, invisible during the daylight hours because of the mass of entwined foliage. Walls are covered with paintings which heighten the garden effect.

Among the exhibitors of vehicles are the following:

Abbott Motor Sales Co., Abbott-Detroit; H J. Adams, Reo; Atwood Automobile Co., Overland, Marmon, and Standard electric; Auglaize Motor Car Co., Auglaize; Auto Exchange Co., Regal; Banting Machine Co., Paterson and Krebs commercial; Baumgardner & Kibby, Oakland and Columbus electric; Blovins Auto Sales Co., Sandusky trucks; Bunnell Auto Sales Co., Cole and Little; Clyde Auto Sales Co., Detroiter and Nyberg; Cornelius-Hohly Auto Co., Imperial; Dennis Motor Car Co., Rambler, Detroit electric and Alco trucks; Ford Bros. Auto Sales Co., Michigan and Krit; Gamble Motor Car Co., Peerless, Garford and Ohio and Baker electrics; Gauntlett Auto Sales Co., Buick and G. M. C. trucks; Grasser Motor Co., Hupmobile; M. E. Humbarger, Apperson; E. W. K'Burg, Stearns, R. C. H., and Hupp-Yeats electric; Landman - Griffith - McIntyre Motor Co., Flanders, Flanders electric and Stoddard-Dayton; Litchie Automobile Co., Cadillac; Maumee Motor Car Co., Empire and King; Moore Motor Truck Co., Moore trucks; Roberts-Toledo Auto Co., Ford; Standard Auto Co., Packard, Imperial and R. & L. electric; H. E. Thorne, Mitchell and Paige-Detroit; Toledo Motor Sales Co., Hudson; Union Supply Co., Pierce-Arrow and Chalmers; White Motor Car Co., White pleasure and commercial.

Automobile Horns as Factory "Whistles."

Because its factory whistle could not be heard above the din of its whirring screw machines, with the result that much playtime was lost by workmen who failed to "knock off" on time, a Worcester, Mass., factory has been equipped with a Klaxon horn to take the place of the time-honored steam blast, though the idea is not a brand new one, strictly speaking. No less than 76 Klaxons are used for a similar purpose in a Newark, N. J., thread making factory, and 12 more are used by a packing company in Passaic, thus adding still another purpose to the long list already served by Klaxons, which have become fairly common as adjuncts to fire alarm systems in a number of manufacturing and private institutions.

The suggestion comes from abroad that radiator cooling fans might be provided with variable speed gears, so that on a very hot day or with a following wind the cooling effect might be increased by speeding up the fan. Whether the added complication is justified is another question.

Now a Step Ladder for Limousines.

Apparently permeated with a feeling of solicitude for the welfare of "luggage and tyres" and showing a reckless abandon regarding the amount of accessories that may be carried on a car, a British firm of supply dealers has brought out a folding step ladder described as having been "specially made for the safe conveyance of luggage or tyres to and from the roofs of motor car bodies." As it measures three feet in length, the price has been set at "three pounds ten," and it weighs only 18 pounds!

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ENGINEERS ELECT AND DISCUSS MANY TOPICS

Marmon Formally Installed as President and Steps Taken to Commemorate Departed President—Progress Revealed by Standards Committee Reports—Subjects Discussed During Three Days of Winter Meeting.

Already high up in the world and climbing higher, the Society of Automobile Engineers last week reached an altitude record for itself when the annual winter meeting was held on the 24th floor of the Hotel McAlpin, in New York City. There can be no doubt, however, that as an engineering organization the society would climb even higher in importance to the automobile trade than it is at present, which fact is made very plain by the almost phenominal growth of the membership list; if the meetings served no other purpose, which is not true, they served to demonstrate that the society is growing, and growing fast.

Notable Increase in Membership.

During the past twelvemonth, the membership roll has grown from approximately 1,000 in December, 1911, to nearly 1,500 in December, 1912. Indicative of the real value of the work that has been done in the past and still is being done, and the natural manner in which engineers in every branch of the industry gravitate to the society with the minor and major problems which it is hoped to have solved by open discussion, upward of 400 members attended the sessions which were held January 16, 17 and 18.

Quite naturally, among the more important business that was transacted, the annual election of officers assumed a most important place, and though the mere nomination of men to fill the places of retiring officers always virtually has meant their election in the past, the counting of the mail vote at the first session nevertheless served to eradicate even slight feelings of suspense. The slate as nominated went through without a hitch, Howard Marmon, of the Nordyke & Marmon Co. of Indianapolis, Ind., becoming president; J. G. Perrin, chief engineer of the Lozier Motor Co. of Detroit, Mich., first vice-president, and Russell Huff, chief engineer of the Packard Motor Car Co., of Detroit, Mich., second vice-president. Coker Clarkson and Hermann F. Cuntz were retained as secretary and treasurer, respectively, quite as a matter of course.

Changes Made in Official Roster.

As members of the council, Joseph Anglada, E. P. Russell, of the Locomobile Co. of America, and Harold L. Pope, of the Pope Mfg. Co., replace Robert McAllister Lloyd, Henry May, Howard Marmon and Charles Ethan Davis, whose terms expire. The members of the council who "hold over" are: Charles B. Whittelsey, A. B. Cumner, A. L. Riker, Howard E. Coffin and Henry Souther. As president, Marmon succeeds H. W. Alden, who last August automatically became president with the death of Henry F. Donaldson; as vice-president Perrin succeeds Pope, who has been made a member of the council.

Propose Monument for Donaldson.

Under the head of new business, the only item which came up concerned the placing of a monument over the grave of past-President Donaldson. It was proposed and formally decided that the society finance the erection of a suitable stone properly lettered with the S. A. E. emblem in commemoration of Donaldson's services and in recognition of his personal worth.

As is usual, the professional sessions were well crowded with work, though in contrast to the summer meeting, when a number of papers were held over and none of the topics for discussion were discussed, everything on the program was carried out according to schedule, with the exception of four items—the fourth report of the Ball and Roller Bearings Division and the third report of the Frame Sections division of the Standards Commmittee, and the topics for discussion on magneto couplings and the "Relation of design to Construction in Motor Cars," the latter being considered too broad a subject for informal discussion.

Consider Reducing Number of Rims.

With the exception of one report—the report of Wheel Dimensions and Fastenings for Tires Division, by Wm. P. Kennedy—all reports were accepted, though in none of them are recommendations of a startling nature made. In view of the fact that there still exists great variety in opinion regarding just what standard types of rims should be advocated, and by reason of the expected disruption of the United Rim Association, which, as was pointed out by Chairman Souther, probably will result in the market being flooded with many new types of rims, it was decided not to accept the report until more definite conclusions could be reached, and as a result it was referred back for further consideration. Unfortunately, the subject of wire wheels, which was scheduled as a separate topic for discussion at the last minute, was included for discussion with the report on rims and fastenings, with the result that much was said about rims, and wire wheels were almost completely forgotten. With regard to rims, however, it was decided that there are at present too many sizes on the market, and in the belief that the number can be reduced very considerably to the mutual advantage of all concerned it was resolved that a commmittee be appointed to consider and report on the subject at the next meeting of the Standard Committee. The committee appointed consists of H. L. Barton of the Genera Motors Co., G. G. Behn of the Hudson Motor Car Co., C. E. Reddig of the Timken Detroit Axle Co., C. B. Williams of the Mott Wheel Works, J. G. Vincent of the Packard Motor Car Co., C. B. Whittelsey of the United States Rubber Co., H. E. State of the Goodyear Rubber Co., Henry Southern, consulting engineer of the Standard Roller Bearing Co.

Standards Committee Reports Progress.

Owing to the fact that the manufacture of broaches still is in a process of evolution, a really comprehensive report by the Broaches Division, headed by C. W. Spicer, was impossible, for which reason the report submitted, which is the third, was accepted as read with no discussion. The report is essentially a report of progress, and while no new data was submitted, a number of special considerations were brought up, among which the most important, as marking a step forward in manufacture, was the hobbing of splined shafts which now serves for machining.

The third report of the Miscellaneous Division, made by Chairman A. L. Riker, also was accepted as read, the most important portion of it consisting of a number of new magneto dimensions. In the second report, accepted at the last meeting, the height and length clearance required and also the additional clearance required were listed separately; in the new report they are combined. Similarly, the width dimensions have been simplified, the only

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other alteration being the addition of a standard thread for the end of the magneto shaft. It is recommended that the shaft be ⅜ of an inch in diameter, and that it have a 16-pitch thread .5905 inches in length. The advance lever radius also was standardized at 2.125 inches.

The table of dimensions, as adopted, is as follows, the first nine items remaining unchanged:

Four and Six-Cylinder Magnetos

	MM.	Inches.
Shaft height	45.	1.771
Distance from center 2 front base-plate holes to large end of shaft taper	53.	2.086
Distance from center front base-plate holes to rear base-plate holes	50.	1.968
Distance from centers of base-plate holes left to right	50.	1.968
Large diameter	15.	.590
Small diameter	12.	.472
Length of taper	15.	.590
Taper 1:5 (included angle) 11° 30′ approx., Woodruff key No. 3.		
Height of magneto space	203.	8.000
Length of magneto space	254.	10.000
Width of magneto space	127.	5.000
Plain hole timing lever	6.35	.25

Tapped hole timing lever, ¼ inch, 28 pitch, S. A. E.

Base-plate holes, ⅜ inch, 16 pitch, U. S. F

Thread for end of magneto shaft, ⅜ inch, 16 pitch, U. S. F.; length of thread, .5905.

Advance lever radius, 2.125 inches.

The report of the Sheet Metals Division, which is the fourth, also was essentially a progress report and was accepted as such. In rendering the report, Chairman T. V. Buckwalter advocated very strongly that efforts be made to standardize sheet metal gauges. During the interim between the last meeting and the present one, letters have been addressed to all members of the trade using sheet metals and rods, with a view to determining what sizes they use, and until all have been heard from it has not been found advisable to recommend any standard sizes. It is hoped, however, that by the next summer meeting, sufficient data will be in hand to permit the submission of a comprehensive report upon which recommendations for standardization can be made.

Although the division on motor testing which was created at the summer meeting with John O. Heinze as its chairman, has been in existence but a short time, its activities have been most marked, and though the work has not progressed far enough to warrant the recommendation of any standard method of testing motors, the report as read was none the less interesting, as indicating the real necessity for some such standardization. In the report, Heinze included a number of very large diagrams and proposed forms of horsepower curves suggested for use. There was little discussion on the report, however. The second report of the Nomenclature Division (chairman, E. J. Stoddard) was another that was essentially a progress report, which was rendered verbally and therefore elicited very little discussion. The third report of the Springs Division (chairman, Harold L. Pope), in which dimensions and designations for springs are recommended, already has been printed in the proceedings of the society, and it only remained for it to tbe formally accepted. It was read by title and no discussion preceded its acceptance.

Two New Bronzes Recommended.

In the third report of the Aluminum and Copper Alloys Division, submitted by Chairman Wm. H. Barr, and accepted with scarcely any discussion, two new bronzes are recommended—the first, consisting of 87 to 89 per cent. copper, 9.5 to 10.5 per cent. tin and 1.5 to 2.5 per cent. manganese, being suitable for valves and light gears, and the other, consisting of 88 to 89 per cent. copper, 11 to 12 per cent. tin and 0.15 to 0.30 per cent. phosphorus, being suitable for gear bronze, the alloy being similar to English gear bronze.

In reading the report of the Truck Standards Committee, which was accepted as read and was essentially a progress report, Chairman Wm. P. Kennedy drew attention to the fact that because not all manufacturers had replied to a set of printed questions submitted to them, it was impossible to render a really comprehensive report. No standards are as yet ready for recommendation, the committee, as outlined in the report, being at present engaged in determining a number of the more important points for standardization, such as the most suitable size of motor for the load and the proper sizes of tires with regard to the load.

Gasolene Comes In for Attention.

It was not until Thursday morning that business had reached the point where the reading of the set papers was in order. The session was styled a "commercial vehicle session," and all of the subjects treated had to do directly with trucks. Cornelius T. Myers read the first paper, entitled "Comparative Data on Performance of Motor Trucks with Regard to Size of Motor and Gear Ratios," which consisted essentially of a number of performances and cost charts. It was followed by a paper, "Low-Grade Fuel for Motor Trucks," by N. B. Pope. In drawing attention to the necessity for an alternate fuel, Pope suggested that "there is good reason to hope that the fuel difficulty may be relieved in a large degree by co-operation between the automobile maker and the refiner, though the result of such co-operation cannot under the circumstances be realized for a period of months, possibly of several years." He further made the obvious, though nevertheless seldom thought of, point that "as a large proportion of commercial vehicle types may be said more truly to be in the early stages of evolution than are pleasure vehicles, it follows that the adaptation of special apparatus for handling low-grade fuels will work less hardship on the truck manufacturer than it would if forced on the builder of established types of pleasure vehicle. Further, the higher valuation placed on operating economy by the commercial vehicle purchaser must tend to render the kerosene- or naphtha-burning machine a more acceptable offering in that field than a pleasure car possessing the same feature would be in its field. Indeed, were it possible to offer almost any large truck user a carburetter that would handle a low-grade fuel as efficiently as his present carburetter handles gasolene, there is little question that he would accept the substitute immediately, on the basis of a not unreasonable performance guarantee."

Resume of Foreign Tendencies.

Very little discussion followed the reading of a paper entitled "Foreign Tendency of Motor Truck Design," presented by L. C. Freeman. "A composite picture of the predominant English motor trucks," he said in substance, and in leading up to a more critical survey of the "high spots" of foreign design, "would show the motor under a hood in front of the seat; right-hand drive; fixed spark magneto ignition; thermo-syphon cooling; three-speed transmission; cast steel plain-bearing wheels; rear springs taking both drive and torque; both brakes on rear wheels, and worm, pinion or chain final drive."

Later, he drew attention to the fact that the worm drive has a shade the better of the argument in England at present, but is not gaining ground very rapidly, while in France it is not yet considered seriously. Owing to the length of a paper by B. B. Bachman, entitled "Comparative Results with Solid and Pneumatic Tires on Light Commercial Vehicles," only extracts of it were read and very little that is not already known was brought out in the discussion.

Pierce-Arrow Man Defends Worm Gear.

Thursday evening's session was rounded out by informal discussions on "Worm Gears," "Motor Starters for Commercial Vehicles" and "Metal Wheels," though none of the discussion was productive of information really enlightening, in view of what already is known. As usual, David Ferguson, of the Pierce-Arrow company, had much to say in their defense. Strangely enough, the second subject elicited very little discussion, the concensus of opinion being that, despite apparent advantages, it was

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not advantageous after all to equip commercial vehicles with engine starters, the greater complication being the excuse that found most ready and most frequent use. Nor did the subject of metal wheels give rise to a great amount of argument, it being held by nearly all of those who spoke that the metal wheel undoubtedly has advantages but that the advantages are confined to its use for particular purposes.

Wilkinson Delves Into Formulæ.

All of Friday morning was taken up by the reading of four papers that were held over from the summer meeting, the first three of which, "Stability of Automobile Propeller Shafts," by J. M. Thomas, "Leaf Springs," by L. J. Lane, and "Method of Brake Capacity Determination," by S. I. Fekete, were published in Motor World in connection with the report of the summer meeting. The fourth, "Effect of Relation of Bore to Stroke in Automobile Engines," by John Wilkinson, was inordinately long and replete with abstract formulas and so highly technical as to be of interest chiefly to those intimately concerned with engineering practices; it elicited scarcely any discussion.

The paper on "Exhaust Gas Analysis," by Dr. Arthur H. Eliott, which headed the list for the afternoon session, and which dealt primarily with the determination of efficiency by means of analyzing the exhaust products, caused considerable discussion from Herbert Chase, E. R. Hewitt and Professor W. C. Marshall, the concensus of opinion being that the importance attached to the method outlined was not warranted by the results obtained, and that great reliance could not be placed upon it. The subject was one which dovetailed fairly well with the scheduled topic for discussion on the "Relation of Road Testing to Dynamometer Testing," and hence these two were merged. E. R. Hewitt opened the discussion and was followed by Professor Marshall, who laid great stress upon the value of the accelerator as a testing instrument, which, he said, was not generally realized.

Anent Carburation and Balance.

In a very short paper entitled "Motor Testing," which covered in a general way points which have been observed under specific testing conditions in one laboratory, Charles P. Grimes brought out the interesting fact that carburation may have a very decided effect on the running balance of a motor, a case in point being a long-stroke L-head motor which, equipped with a stock carburetter, vibrated badly at 22 miles an hour; by changing the carburetter the point of vibration was reduced almost entirely and was scarcely appreciable at 32 miles an hour.

Of the several topics for discussion on Friday evening and Saturday morning, none proved productive of greater discussion than the question: "Will the six-cylinder motor eventually displace the four for pleasure cars?" The concensus of opinion was that the four-cylinder motor never would be eliminated, the discusion being opened by J. O. Heinze, who stated that, while it is possible by fitting a much heavier flywheel to a four-cylinder motor to obtain the smoothness of operation of a "six," the smoothness is obtained at the expense of accelerative powers which are indispensable if the "four" is to have flexibility. The "four," he farther pointed out, is superior in efficiency to the "six" and, if for no other reason, is bound to be continued in order to supply the demand for a machine that can be operated at comparatively low expense.

Much the same opinion was held by Howard Marmon, who caused laughter by stating that the use of the word "pleasure" in connection with a car generally is a misnomer, in view of the fact that the average pleasure car seldom is used for pleasure alone. Where it is used for pleasure alone, as for touring, and not for town service, the "six" represents real luxury, but as long as cars are used for both pleasure and work, as represented by town service, which demands low upkeep cost as compared with the upkeep cost of a comparatively heavy "six," the "four" must survive. As regards the use of six-cylinder motors in trucks, the opinion prevailed that their efficiency is not great enough and that, as there is less demand for flexibility and lack of vibration, the four-cylinder motor amply fulfills all demands.

Elimination of Magneto Improbable.

In response to the question "With the motor starter, lighting plant and ignition possible in one unit, will the magneto be discarded?" the concensus of opinion as revealed by the discussion was that the magneto is an excellent device for its purpose and that it is not likely to be discarded for a long time to come. Speaking in favor of the elimination of the magneto, Harold L. Pope ventured the opinion that it eventually would be found possible to combine lighting, starting and ignition with proper efficiency for each function and that before very long some such system must be evolved.

Of the other two topics remaining, the discussion provoked by the question "Is the transmission located preferably on the rear axle, as a separate unit, or combined as a unit with the power plant?" was the more voluble. Howard Marmon summed up in defence of the rear axle position by stating that it permitted greater accessibility, reduced the strain on universal joints, thereby conducing to greater life, permitted the use of a "springy" propeller shaft, thus cushioning the shock of the gears and, contrary to expectation, added only about 5 per cent. to the weight unsprung on the axle. As against this, it was pointed out by others, among whom were Prof. Hutton, that the rear axle position is the dirtiest position on the car and that as a result there was grave danger of abrasive material getting into the gear case and causing damage. Greater accessibility also was claimed for the gearset combined in a unit with the engine, and altogether opinion was very evenly divided as to which of the three locations is the best. The remaining topic—"Why has the 42-inch wheel been discarded?"—brought out very little discussion, the concensus of opinion being that its greater expense, both for wheels and for tires, was not offset by the smoother operation and easier riding generally credited to it.

Truck Men Breakfast and Discuss.

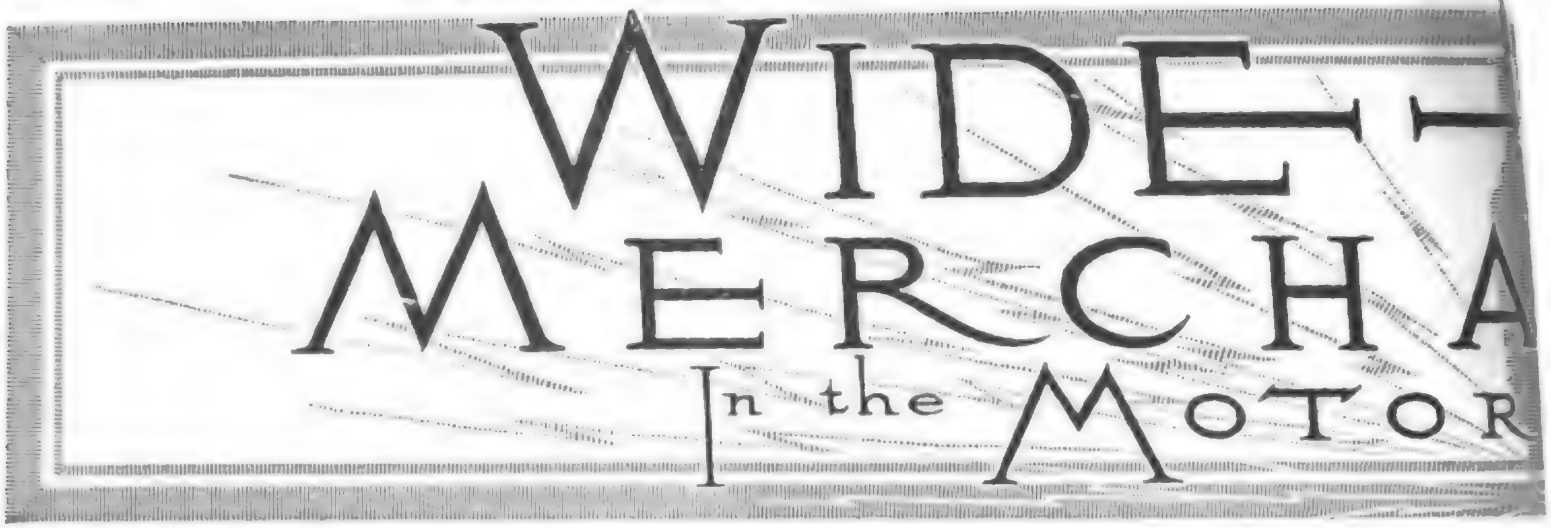
Combining a measure of business with a much larger measure of pleasure, the Motor Truck Club of New York City, on Tuesday morning "breakfasted" its members and some who are not members but whose prominence in the trade gives them the entree to all such functions, at George Rector's hostelry, the club's own headquarters. By reason of the fact that many of those invited are taking active part in the commercial vehicle exhibits in Madison Square Garden and Grand Central Palace, the "spread" was served in the morning between the hours of 10 and 12, and the wisdom of those in charge in choosing such an unusual time for a banquet, if it may be termed such, was reflected in the attendance; upward of 300 persons were ranged about the tables.

Quite naturally, President D. C. Fenner made the opening address, and after reviewing the aims and ideals of the club, gave way to F. F. Beal, of the Packard Motor Car Co., who presented a paper on "Production." The other papers and addresses that served to inject a slight business-like flavor into the proceedings were: "Advertising and Selling," by P. D. Wagoner, president of the General Vehicle Co.; "Operating Motor Trucks," by Elisha Flagg, Jr., general manager of maintenance for the American Express Co.; "Motor Truck Service," by George H. Duck, of the American Locomotive Co.; "Past—Present—Future," by Walter Wardrop.

Bauer Quits Cars for Accessories.

Frank Bauer, until recently connected with the Oakland Motor Car Co.'s purchasing department, has acquired an interest in the Durable Co. of Detroit, of which he has become president. The company manufactures leather automobile accessories.

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OLD CARS THAT CUT PROFITS

How One Big Company Prevents Loss by Providing Penalties—Advertising Value of Actions Made Plain.

It may have been all right for the "shoemaker's children to go unshod" in the old days, but in this day and age it is regarded not simply as poor business for the shoemaker but as very bad business for everybody concerned. And there is not a great need to enter into a prolonged discussion in order to point out the reasons why. It is fairly well established that this is an age of advertising, and it is recognized that whether one likes or not, everything he does advertises him favorably or otherwise. Nevertheless, the sight of a dealer driving a last season's or a two-year-old car of a make he has long since discontinued the sale of, may well make the observant ponder, even to the extent of wondering if his dealer's faith in the products he used to sell is not greater than that which he has in eye on" the automobile dealer, at least so far as what he drives is concerned, and this suggests two things, both of which are recognized in a recent circular of instruction issued to branch managers of the Studebaker Corporation: First, the paramount importance of the dealer driving and demonstrating with the very latest model. Second, that the car driven shall be kept polished and spotless and tuned up to the very highest pitch mechanically—not sometimes, or occasionally, but all the time.

Old Cars That Cause Trouble.

So vital does the Studebaker Corporation estimate these two points that it is made a misdemeanor for a branch manager to drive anything but an up-to-date model and to drive or send out for a prospect, dealer or otherwise a car that is not spotlessly clean.

All this is in the line of good merchandising and good advertising, equally applicable to dealers in all lines of cars.

"CASHING IN" ON THE SHOWS.

show printed matter and enough of it to cover their mailing lists; it should be imprinted with the dealer's name and address, and then mailed it to all prospects.

Don't expect marvelous results; but mail it, nevertheless. Send it under two-cent postage, if necessary. It probably cost the manufacturer several times what you will pay for postage and, if he furnishes it to you without cost you can well afford to mail it to your prospects at your expense. Try it for what it is worth.

QUALITIES THAT SELL GOODS.

Selling automobiles is not essentially different from selling any other specialty. Some of the things that count are knowledge of the goods, study of the customer and his needs, energy, persistency, tact, honesty, confidence, earnestness, enthusiasm and work. When a man cultivates and employs all these qualities, results are bound to tell a satisfactory story—satisfactory because represented by dollars and cents on the credit side of the ledger instead of on the debit side.

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AWAKE-N DISING WORLD

EFFECTIVE WINDOW DISPLAY

Three Principal Requirements, But of Themselves They Will Not Achieve Results—Other Things Necessary.

Window displays to-day are receiving attention from automobile accessory manufacturers who are just opening their eyes to the wealth of opportunities to be seized and utilized through attractive window displays. This means that the accessory dealer will do well to take time by the forelock and study the window display question scientifically.

Experience has demonstrated that first of all a window should be of convenient shape and size; second, it should be well lighted; third, it should be kept clean. When all three of the ideal conditions named obtain, the merchant still has only the stage on which the selling play must be built.

Speaking Parts Played by Signs.

He then must people the stage with goods—and, to carry the metaphor still further, there must be speaking parts played by neat signs that will carry the message to the minds of all who pause to look.

Department stores regard their window trims as important assets. So do the live merchants in every other line. The opportunity for the dealer in accessories is just as great. Drawing from the experience of his brother merchants, he will cut down the variety of goods displayed and will time his displays to the season.

On wet, slushy, slippery days non-skid tires, anti-skid chains and other seasonable devices should have the floor. It is the psychological moment. On cold days, anti-freezing devices, hand warmers, carburetter heaters, priming cans and the like will be shown. On hot, tire trouble days, tire patches, cement, vulcanizers, etc., will be in evidence, and so on, adapting the display to the season with a view of having it timely at all seasons.

The idea of the best window trimmers is strength gained through simplicity and neatness. One thing at a time, or several things that relate intimately to each other—but never a group of too many things.

Value of Simplicity in Dressing.

Where forty or fifty different objects vie with each other for attention, it resembles nothing so much as that many people trying to speak at once. Each knows what he wants to say, but the hearers are bound to be in doubt.

The principle of confining displays to a limited range of goods is so well established in other lines as to hardly seem to require emphasis. But the fact is that window displays are only beginning to receive careful consideration from accessory dealers, and there is still much to be learned. Now is the time to learn it.

MIXING AUTOMOBILE ACCESSORIES WITH OTHER GOODS.

Tuttle & Clark, Jefferson avenue, Detroit, were until a few years ago dealers in horse goods. They carried fine harnesses and everything else that belonged to an exclusively high grade horse-goods business. The popularity of the motor car naturally put a very perceptible crimp in their trade. But, instead of bemoaning their fate, they got busy and adjusted themselves to the new conditions. First, they put in a carefully selected stock of what goods they knew fitted into their lines, and, by the way, they have been adding to the length, width and depth variety of this stock ever since. Then they got out a catalog covering these goods, a copy of which was sent to every registered automobilist in Michigan.

Things began to come their way almost immediately, for it soon became noised abroad that this store was catering to motorists in an aggressive fashion. All sorts of leather goods, automobile trunks, caps, goggles, motorists' wearing apparel, chauffeurs' outfits, lap robes, picnic basket equipment, etc., were featured, and many odds and ends were picked up abroad that could be had nowhere in Detroit.

Once the trade started coming the firm laid themselves out to take care of it. And they are continually stirring up things throughout the year.

Worth of Saturday Bargain Sales.

Every Saturday is a special bargain day with Tuttle & Clark. Special prices are quoted just for that day on standard goods. The idea is to get acquainted. The advertisements are usually of moderate size, but well displayed, with prices set large, and plenty of illustrations. The goods featured are unusually seasonable and the ads run in the Friday evening and Saturday morning papers. No effort is made to create sensational ads, but emphasis is laid on the particular values offered. Originally starting as a means of introducing their automobile and motoring lines of goods, these Saturday bargain days have become a pronounced feature of the business looked for each week by the motoring public. Needless to say, they have not only proved profitable for Tuttle & Clark, but have been the means of moving stocks fast and keeping them up-to-date.

Their efforts to reach the automobile public have not, however, been confined to the newspapers. Backing up their handsome catalog, they use special folders in the spring, during midsummer, fall, and at Christmas time. The predominant features of the folders are good paper, fine cuts, accurate, unvarnished descriptions, net prices, well selected goods and attractive use of color printing. Their list of motorists is kept up-to-date, and much of the advertising matter is mailed under one-cent postage. They count on the attractiveness of their printed matter getting it the attention they seek. And they are not disappointed.

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Solutions of The Used Car Problem, in Competition for Motor World's Cash Premiums of $50, $25, $15, and $10 for the Best Four Articles Dealing With the Subject.

By W. H. HUNT, Chicago, Ill.

The spectre of a floor full of second-hand cars upon which an absurd valuation has been allowed in order to make sales of new models, is keeping many a sales manager awake nights and adding years to the age of the small town dealer.

The sales manager of the big branch house is required by "the powers that be" to show a profit on this class of business, if possible, or at the very least an even break. The small dealer is compelled to realize some profit or explain why to his local banker. This is the condition, but the market for used cars seems to be a sealed vault into which it is impossible to break. There seems to be an intangible, unanalyzable something; a force that cannot be classified or overcome, keeping the dealers out of a branch of the business that is essential to their existence.

What is this force? How has the dealer been placed in this position,

To the man who has followed the course of automobile events for a few years the answer to these questions is easy. It is lack of confidence.

Let us delve into ancient history for a short while.

In the beginning the rural buyer was very like a sponge and would absorb almost anything offered. He was a trusting soul very much given to the acquisition of "gold bricks," "acrobatic buildings" and other bric-a-brac of like value, among which were automobiles that were a godsend to the newspaper funny man but a never-ending source of horror to the poor misguided individual who tried to make them live up to the designers' expectations. Nobody will ever know how many of these poor souls have acquired the habit of sleeping under the bed with a "buffalo wrench" in one hand and a screw driver in the other.

The cars that were palmed off onto this class of buyers were the ones that the dealer had taken possession of with a smile and disposed of with a positive chortle. These machines were well nigh impossible to sell in any other way than with "sight draft attached to B/L."

But to resume our story. To be sure our rural friend had the privilege of examining a perfectly beautiful fifteen dollar coat of paint and an immaculate thirty dollar set of tires without more than two sections set into any one shoe. To be sure he had the opportunity to use an experience in things pertaining to the automobile that he had never had the opportunity to gain. But what good did the opportunity do him without the knowledge? If his native caution warned him to refuse delivery he, of course, lost only a small matter of twenty-five or thirty dollars which he had deposited to cover "freight charges one way." But if, in his trustfulness, he accepted the car he paid to his local bank the amount of the draft (which, by the way, was never drawn for more than two hundred per cent. of what the car could have been bought for at the point of shipment), and forthwith began his automobile education, which was liberal in every acceptaserve as a warning to their neighbors and friends among whom they are a laughing stock.

It is these farmers and their sceptical neighbors whom the dealers, all over the country, are depending upon to absorb the used cars as rapidly as they are offered.

But the "burnt child shuns the fire," and the second-hand car buyer who has been "stung" turns pale and thinks of the mortgage every time he hears a "burred gear" or a tire "blow out."

I think that I have made my case clear. You, dealers, have killed the "goose that laid the golden eggs." You have killed the confidence of the class that you depend upon to relieve the pressure. The question now is, Can that confidence be revived? It can. But it is going to be a long, tedious process. It can be restored by only a long, careful nursing of the second-hand car market. And what is to become in the meantime of the house that is filled to overflowing with old models?

Ernest Warner of Wakefield, Ill., proposed a remedy in the November 28th issue of Motor World. He suggested that the dealers of each State get together and appoint a sort of an inspector to pass upon the condition of each used car offered for sale in his territory, and also place a fair value upon it. So far, good. But will the dealers voluntarily remedy defects as the inspector finds them? Will they handle the cars at the valuation the inspector places upon them? How about favoritism? Will the inspector place the same low valuation on the "good fellow's" car that he will upon the car belonging to the "grouch"? Furthermore, an inspection bureau, such as outlined, is going to cost considerable in salaries and railroad fares for the inspectors. That one man can do the work nobody can believe.

Finally, there has been established, in the city of Chicago, just such an inspection bureau as Mr. Warner has outlined. This concern works without cost to the dealers, as it takes its compensation from the buyers only. It renders to the buyer a very complete, exhaustive report, covering the mechanical condition of any car the buyer may select.

The seller of the car is given every opportunity to remedy defects in his car before the report is delivered to the customer. If he is honest in his dealing he is ready and eager to take advantage of the opportunity. However, if the car is in bad condition and the dealer is indifferent to the best interests of his customer, he should and does meet with obstacles to the consummation of the sale of that particular car. The result of this work will be that this latter class of dealers and their worthless cars will soon be eliminated from the field. Then, and then only, will the customer who wants to buy a used car but is afraid regain his confidence in the honest dealer and begin to relieve the tension in the used car market.

We, in the trade, know that there are many wonderful values to be had in used cars. But we also know that for

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REILLY AROUSED TO VALUE OF ACCESSORIES

Exhibit at Automobile Show Gives Realization of Profits Possible to be Gained by Dealer in Cars—Resolves to Enlarge His Business When He Gets Home—Discusses Plans with Sales Manager.

After having made several changes of his overcoat from his arm to his back, Reilly, who was beginning to feel warm again, took off his overcoat for the fourth time, but he had it off not more than ten minutes when one of those mysterious draughts which are characteristic of Madison Square Garden hit him in the back of the neck and on went the coat; he was inclined to be miserable, because he had gone without a comforting after-dinner smoke in order to hurry to the Garden, the smoke being dispensed with because such pleasure is forbidden in that metropolitan institution which operates under the name of subway but which in principle is very much like an up-State cannery.

Reilly Develops Foot Weariness.

At the Garden he thoughtlessly lighted a cigar and prepared to enjoy himself in a ramble among the cars and accessories, but had progressed not more than three spaces and a half when a red-coated six-footer said "No smoking, please," and away went 12 cents' worth of good Connecticut Havana. After a perusal of a long row of accessory exhibits he arrived at a cluster of seats which resembled a lost section of a theater, and having a typical case of automobile show foot-weariness the dealer dropped into one; from this vantage point he could get a glimpse of the press room and occasionally got a whiff of the atmosphere from this sanctum, when some entrant pushed aside a section as he entered, for, while smoking is forbidden in the Garden, this is one place where everyone smokes and smokes anything. Even second-hand—or "used"—smoke was comforting.

Impressions Gained from the Display.

Reilly was surveying the cars and bright lights with the air of a blase first-nighter, when his repose was interrupted by a query from beside him: "Well, outside of the fact that you're hot one minute and cold the next and have sore feet and can't smoke and have seen so many cars that they all look alike, how do you like the show?"

"Huh!" exclaimed Reilly with a start, as he turned to see who was addressing him. The Sales Manager stood there smiling. "Oh, hello, Jim!" greeted Reilly. "Great show, isn't it?"

"Glad you came?" questioned the Sales Manager.

"I certainly am; I wouldn't miss it for anything," was the answer. "The business certainly is coming along all right, isn't it? A man would have to be pretty much of a kicker to find fault with almost any of the cars this year. He sure gets his money's worth—starters, lighting systems and equipment galore."

"The accessories certainly are a tempting



A RED-COATED SIX-FOOTER SAID "NO SMOKING, PLEASE"

lot, for one thing, aren't they?" asserted the Sales Manager, as he extended his hand toward the row of exhibiting spaces where was visible a host of devices designed to make the car owner comfortable and happy—also to assist him in keeping the accessory makers and dealers happy.

"Do you know, Jim," stated Reilly, "the accessories have impressed me this year as never before; I am just beginning to wake up to the real meaning of all this stuff that is shown here. I always have believed there was money in accessories and such stuff for a dealer in cars, but I don't think one of us out of twenty is getting anywhere near what he should from that business."

Decides to Stock More Accessories.

"What are you going to do? Give up cars and turn accessory dealer?" asked the Sales Manager.

"No, not that," explained the dealer, "but I'm going to make some money out of accessories. How many things are there here that a car dealer could sell to his customers if he only had a stock and pushed it? I have carried tires, horns, hood covers, spark plugs and a stock of actual necessities, but I'm going after more business; I know it can be done from the way my limited stock has moved.

"The accessory makers are turning out new things right along, and many of them have real merit; of course, a great many of the new devices add too much complication or have other undesirable features, but there are a lot of them that would sell if the car owner had them brought to his attention. Most owners are able and willing to pay for comfort and convenience and would never hesitate at spending the small amount for which the average accessory calls."

Enumerates Some Popular Devices.

"What are you going to do—stock all of them? If not, where are you going to draw the line?" asked the Sales Manager.

"As to drawing the line, that will have to be a question of personal judgment," said Reilly, "and I am not going to stock everything that's made. But just take one instance, as an illustration; how many owners like to work hard pumping up a tire? You don't need to answer; the man who drives a car would almost rather tow it home than pump up a big, heavy tire. As to pumps, some of them are attached to the motor and are expensive and come more as manufacturers' equipment; but I ran across one to-night that sells for a reasonable price and ought to make a good seller for a dealer. It's a spark plug pump that is attached and taken off by a turn of the wrist, which is much easier than working a hand pump, as you will admit if you ever pumped up a big tire.

Old Idea But of Greater Growth.

"These things that have impressed me are not necessarily new, but the idea has assumed new proportions to me; once the idea began to grow it seemed as if everything I saw looked good, and I have gotten more out of the accessory show than I ever did before. I have seen a whole armful of compact little tool kits, socket

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wrench outfits and so on, and there are many owners who would buy those things. But the whole idea centers around the one fact that while owners may not be buying all this stuff now they would buy more of it if they had it pushed out in front of them and its advantages emphasized.

Sales Manager Tries Out New Things.

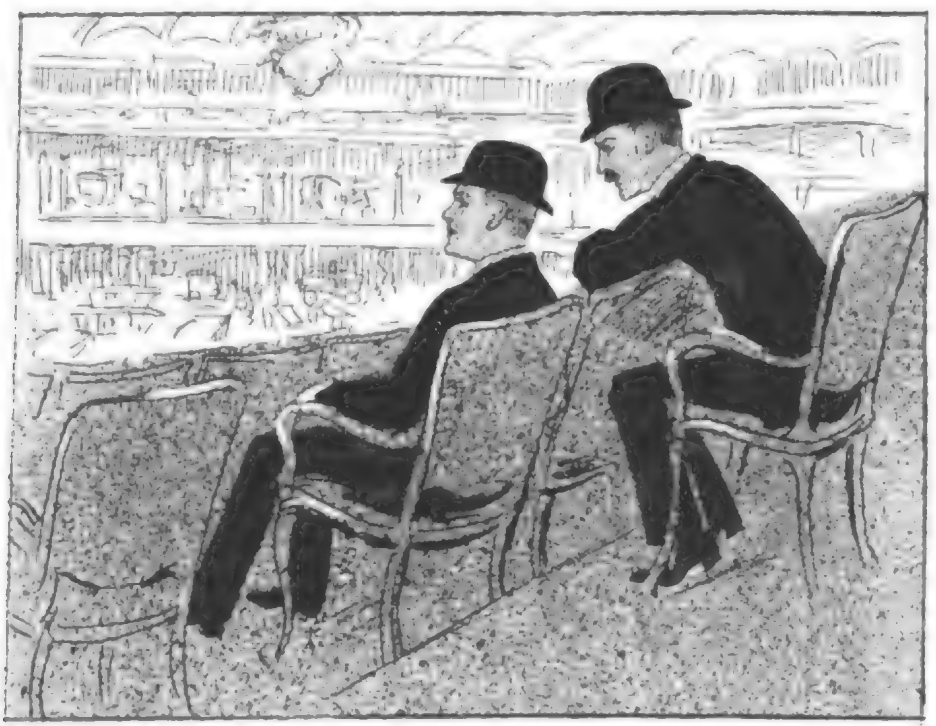
"I dont' want to encroach on your trade," confessed the Sales Manager, "but I might as well tell you that on the sly I made a dicker with some of these accessory people to-night to send me on some of their devices for my own car. They didn't give them to me, either; I paid for them, and I'm going to use them myself."

a car. All of them fell in with my little scheme of getting hood covers this fall when the weather began to get cold, and I have sold a big order of that one line in my town; it wasn't hard, either."

"Don't you think it might hurt your other business?" asked the Sales Manager, more to keep up his end of the conversation than because he believed there was necessity for the question.

Proper Display Necessary Feature.

"I don't see how," was the response. "Accessories can be a very profitable side line. The scheme as I have framed it thus far in my mind its to get the display of goods in such a place that every man who comes into



"I'M GOING TO MAKE MORE MONEY OUT OF ACCESSORIES"

lic realize the comfort and convenience of the telephone. Just the same way, all these owners who have their cars with the equipment put on by the manufacturer can be educated to the point where nothing is too good for them; in fact, they're at that point to-day. All that is needed is for the dealer to push the goods.

"When you stop and think it over, Jim, there is a big point in the way manufacturers have taken to equipping their cars; they have only served to whet the car owner's appetite for more equipment. A few years ago an owner was satisfied to pay for his car and then buy what accessories he needed; but by the insistent demand he made for more equipment on his car he has brought the manufacturer to the point where he is adding a wealth of things to what used to pass under the name of car. But owners haven't changed so very much, despite this equipment, and the majority of them are willing to buy extra stuff if they feel they need it. The dealer's part is to make them feel they need it. The whole proposition is simply that the accessory dealer always will be one step ahead of the car manufacturer in offering equipment. And not only will he sell goods that do not come with the completed car, but there always is a market for replacing accessories that have given out in service."

Made Some Profit But Wants More.

"I always thought you claimed you were making something out of accessories," chided the Sales Manager.

"I did claim to," admitted Reilly, "but I make the claim right now that I'm going to make more out of them; this show has served as quite an awakener to me—also. I'm afraid it will put me on the bum. If I've put this overcoat on and taken it off once I'll bet I've done it twenty times.

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CARE AND REPAIR OF LIGHTERS AND STARTERS

What to Do When the Lights Grow Dim or the Starter Refuses to Start—Normal and Abnormal Conditions Explained in a Manner to Make Them Plain to All—Disco Electric System Dissected.

(This is the sixteenth of a series of articles designed to make clear the electric lighting and engine-starting systems in use and to render easier their care and repair by the dealer and owner alike.)

The engineer on an ocean liner quite naturally takes justifiable pride in the machinery under his care; clean metal, smooth-running bearings and rhythmic motion appeals even to the passengers, and the "pit," where the giant engines throb, is a veritable theater; the steady beat of the "heart" has a fascination that is undeniable.

To the engineer, the gentle vibration, the ceaseless journeyings of the piston rods up and down their slippery slides and the continual murmur of the journals is the music that sings "all's well." His trained ear catches in an instant the slightest falter or the faintest of "different" sounds. Of course, the engineer is paid a good, fat salary to be eternally vigilant—to watch over his engines as a mother watches over her child. Constant association breeds familiarity that never for an instant is permitted to degenerate into contempt. From a duty, his work soon becomes a pleasure that is all the more absorbing because it provides his sustenance. He is proud to keep his machinery spic and span, and the erstwhile prime reason for keeping it "just so" as a preventive of future trouble soon becomes an ulterior one.

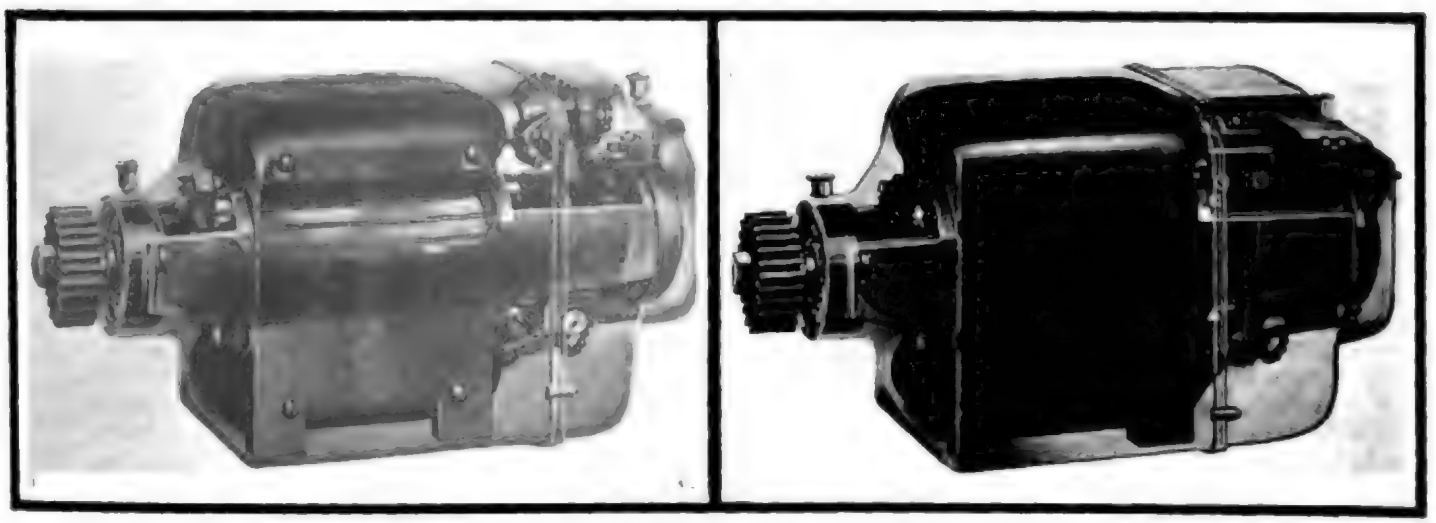
Simplicity of Electric Systems.

Actually, there is no reason why the owner of an automobile should not take just such care of his car and get just as much real pleasure out of the work. And in this connection, it is doubtful if a piece of mechanism can be found that is more interesting and more instructive and responsive to care than is the electric lighting and engine starting system. It is comparatively simple, as has more than once been remarked in the fifteen previous issues of Motor World which contain a series of articles on the care and repair of such systems, it is instructive, and its intelligent care by the owner or by the dealer will pay unexpected dividends not only in the greater satisfaction gained but in actual money saved for repairs and adjustments.

Long Study Is Not a Requisite.

To continue the analogy, the engineer on a liner is required to spend a long term of years learning thoroughly all about the mechanism which eventually will be placed in his charge. After he has acquired the theoretical knowledge, several years must be spent in acquiring practical knowledge, and then he must pass a rigid examination to determine his fitness to doctor and generally care for the machinery. It is not so with the automobile owner, of course. He need know little or nothing about the mechanism, as far as other than himself is concerned; there is none to dispute his right to operate his car, provided he has the necessary wherewithal to pay for its purchase. The cars themselves are simple, and it has followed quite as a matter of course that their accessories have been simplified, and in the simplifying process it goes without saying that the electric lighting and engine starting system has received its full measure of treatment.

As is the case with very nearly every other part of a car, to simplify means in a large measure to make more accessible, which is indicated by the general clearing away of unnecessary parts. Fortunately, the location of an electric lighting and engine starting system presents few difficulties that cannot be overcome without sacrificing accessibility. Both generators and motors are comparatively small, and generators in particular can be placed almost anywhere on the chassis where a convenient rotating shaft is available. The pump or magneto shaft is the favorite position, for it affords a ready means of transmitting the necessary power and at the same time ensures a perfectly accessible dynamo position. Often, however, the location of the dynamo in this position necessitates alterations of greater or lesser magnitude in the design of the engine to permit of its proper mounting, and even though such alterations scarcely can be expected to affect the efficiency of the engine, they may increase production cost slightly. It was with these points in view that the Disco



SKELETONIZED VIEW OF DISCO DYNAMO AND STARTER, SHOWING INTERNAL CONSTRUCTION OF EACH

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electric lighting and engine starting system was designed. It is produced by the Ignition Starter Co. of Detroit, Mich., one of the pioneer producers of acetylene engine starters.

Narrowness Permits Easy Mounting.

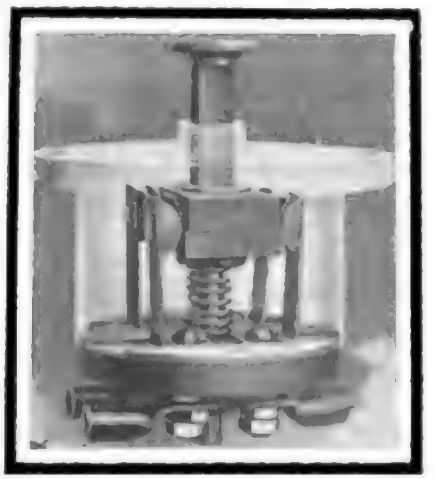
The Disco system is of the two-unit type, in which the generator and the dynamo are separate, the theory behind the design being that the temporary derangement of one unit need have no effect on the other which will prevent its use until the other has been repaired or adjusted, as the case may be. The system is chiefly distinctive by reason of the unusual shape of both the generator and the motor.

In order to permit their easy mounting in almost any position on the motor or the chassis, both have been made exceptionally narrow, as may be seen by the accompanying pictures. The extreme narrowness of the generator in particular makes it a very simple matter to mount it on the engine to be driven by the straight-through shaft that drives the magneto or the pump. Similarly, the motor also may be mounted at the side of the engine, without increasing the overall dimensions of the machinery under the hood and without making necessary any alterations in engine design. Owing to the shape and compactness of the motor, comparatively wide latitude for choice in the selection of a means of gearing it to the engine is afforded; it may be connected either through gearing cut in the periphery of the flywheel after the manner that has become fairly common, or it may drive through the intermediary of a "silent" chain to the crankshaft, the interposition of a roller clutch in either case effectually preventing possible damage through back fires.

Dustproof, Yet Accessible.

The mere fact that both the motor and the generator are accessible naturally reduces to the minimum the already small [illegible] of work necessary in caring for

necessity for positive regulation of the output with the minimum of complication. Consequently, regulation has been made an inherent feature of the machine and is obtained automatically and electrically without the use of external mechanical or electrical devices. It is obtained in the winding and the shape of the pole pieces, the characteristics being that the current produced at seven miles an hour is sufficient to commence charging the battery; at 15 miles an hour, sufficient current is produced to charge the battery and also to carry the lamp load; the maximum capacity of the generator is reached at about 20 to 22 miles an hour, when the output remains constant until a speed of about 35 miles an hour is attained, when the output curve drops gradually. Hence, the generator charges the battery continually, though by reason of its self-regulating feature no harm can come to the battery, which, instead, is benefited.



DISCO STARTER SWITCH

Where Attention Is Necessary.

The generator is connected to the battery by and through the action of a magnetic cut-out of orthodox pattern and simple construction, the function of which is to connect the dynamo to the battery when the

tinuous service for a long period, they may be cleaned with fine emery cloth, though great care should be taken to see that the two faces are exactly parallel when the cleaning operation is completed, and that the adjustment has not been disturbed.

Excessive Lubrication Detrimental.

The motor in the Disco system is of the plain series wound type in which the torque increases with the load up to certain limits which it is virtually impossible to exceed. It is constructed to carry heavy currents without heating, as may be judged by the diameter of the field wiring apparent in the accompanying picture. Like the generator, the motor is completely enclosed, though its mechanism is accessible merely by removing the end plate over the brushes. Owing to the fact that it is used infrequently and then for only a few seconds at a time, it seldom will require to be touched, though it will do more good than harm occasionally to open the casing and carefully remove any accumulations of carbon or road dust that may have collected. Under no circumstances should the amount of lubricant specified by the manufacturer be exceeded; the temptation to use an oil-can frequently must be curbed, for little lubricant is required, and if too much is applied it will collect on the brushes and commutator and cause trouble. A few drops of fine machine oil placed in the oil holes about once a month should suffice, unless the starter is used continually, when the "dose" should be increased to correspond to the service.

Manipulating the Switch.

What has been said with regard to the cut-out applies also in the case of the starting switch: As it is seldom in use it seldom will require to be touched. There is nothing in it which can get out of order except under the most flagrant abuse, and it is very unlikely that it ever will give trouble. There is just one consideration which must not

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than will any other part, though the amount in any case will be small.

Sparks That Indicate Trouble.

By reason of the fact that the armature shaft rotates in liberal sized ball bearings, its requirements as regards lubrication will be exceedingly moderate—no more than is required by the average magneto, which is to say, a few drops of oil about once every 1,000 miles will suffice. As the brushes and the commutation surface are large, they will operate for an indefinite time without attention, provided only that they are clean and foreign matter is kept out of the case. Accumulations of dust or oil on the commutator will result in poor commutation, which, in turn, will cause sparking and excessive wear. Theoretically, any dynamo should operate absolutely without sparking at the brushes, though it is extremely difficult to approach theoretical perfection.

Sparking may indicate that the brushes are dirty, that the brush spring tension is insufficient, that the brushes are too short properly to touch the commutator or that the commutator or the brushes are dirty. The remedy for all these troubles is suggested by the trouble itself. Another cause of sparking which generally can be attributed to dirt or to improper brush spring tension is a cut or scratched commutator.

The Story the Ammeter Tells.

If a commutator exhibits scratches, they should be removed immediately before they have time to cause more serious damage, the preferable method being to hold a piece of No. 00 sandpaper against the commutator while the armature is rotating, first removing the brushes from their holders. If the brushes are not removed, small particles of sand may get beneath them and cause far worse scratching than that which is removed. After the sandpaper has been applied, the commutator should be carefully cleaned of gritty particles before the brushes are replaced. The brushes also should be cleaned, a cloth dampened with gasolene being used for the purpose.

Included with the Disco system there is an ammeter which is mounted on the dash and which will serve as an infallible telltale of the operation of the dynamo in addition to indicating the charging current and the amount of current consumed by the lamps. Immediately the car speed exceeds seven miles an hour, the needle of the ammeter should swing over to the charge side, assuming, of course, that no lamps are lighted. If it remains stationary, that fact may be taken as an indication that the generator either is not generating or that the cut-out has not made the connection between the dynamo and the battery. In either case, the cut-out first should be examined to ascertain whether it is performing its function. If it fails to close the circuit, the dynamo next should be tested to ascertain whether it is generating. This may be done by connecting a lamp across the terminals with the engine running at a speed corresponding to about 10 or 12 miles an hour. If the generator is working proppertly the lamp will be lighted, which in itself is evidence that the derangement exists in the cut-out.

When the Starter Refuses to Start.

Loose wires, of course, or broken wires will prevent the passage of current, and in this way prevent the cut-out from working properly. As a matter of fact, loose connections or a broken wire are about the only troubles which will prevent the cut-out from functioning, for there is little in its make-up that can give trouble. If the lights gradually grow dimmer, the condition may indicate that the cut-out contacts have become stuck through some cause or other, thus permitting the battery to discharge itself through the dynamo. Inspection, of course, will reveal the trouble, which generally can be remedied by cleaning the contacts. In some cases the arm of the cut-out may become clogged with dirt, the removal of which, it is needless to point out, will effect a cure.

In cases where the engine starter refuses to start the motor, the battery first should be examined to make sure that it is properly charged. If it is properly charged, a search for loose wires should be made, failing the location of which the motor itself should be examined to make certain that the brushes touch the commutator properly and that there are no broken wires in the circuit.

Part That Carburation Plays.

Although most engine starters are powerful enough to "spin" the heaviest motors at a considerably greater speed than than be attained with a hand crank—the Disco is calculated to "spin" a 4½ x 5½ motor-at 150 revolutions a minute for 40 minutes on an 80 ampere-hour battery, the pressure being 12 volts—it should be remembered that the easier it is to start a motor the better the service that will be rendered by an electric starter and the smaller will be the drain on the battery; the mere fact that an engine is equipped with a starter should not operate to cause neglect of carburation and ignition, which fact often is overlooked—to the detriment of the electrical equipment, of course.

Breakage of Spokes in Wire Wheels.

In endeavoring to ascertain the cause of several broken spokes in one of the rear wire wheels with which a motorist had had his car equipped it was discovered that the breaks were not occasioned by violence but were the result of rust. Apparently the enamel with which the spokes were coated had not covered the whole of the spokes where they entered the felloe band, the result being they rusted through and parted. From which it would appear a wise precaution occasionally to examine wire spokes at their nipple ends to make sure that the enamel is intact, for though the breakage of two or three spokes does not seriously impair the strength of the wheel, it nevertheless represents an avoidable and therefore unnecessary expense.

Gould Adds Ignition and Lighting Unit.

The Gould Storage Battery Co., of New York City, which is closely related to the Gould Coupler Co., and which heretofore has confined its activities to the manufacture of storage batteries, has gone deeper into the field and produced a combined ignition and electric lighting system; later a motor starting unit to work in conjunction with the Duplex system as now manufactured will be produced. The feature of the Duplex system is the double wound armature, from one side of which direct current at six volts pressure is obtained for lighting and charging the storage battery, and from the other alternating current which is stepped up to high voltage in a transformer coil and used for ignition; output control for preventing burning out of the lights or injured batteries at high engine speeds is by means of a differential field, and a magnetic relay serves to sever connection with the battery when the machine voltage drops below that of the accumulator.

Paint to Indicate Bearing Heat.

A new heat indicator for bearings just has been introduced by the British General Electric Co., whose headquarters are in London. It consists of a paint which normally is a bright vermilion, but which, on reaching a temperature of 120 degrees Fahr. shows a change of color and at from 190 to 210 degrees becomes almost black. When the temperature of the part falls below 120 degrees, the paint returns to its normal color. Among the claims that are made for the paint are that it is practically indestructible, that it is unaffected by lubricating oils, that it prevents rust, and that the warning which it gives enables a machine to be stopped before damage results from overheating.

Italy Seeks to Stimulate Tractors.

Under the auspices of the Italian Touring Club, a competition and exhibition of farm tractors and agricultural motors is to be held in Parma, Italy. The affair will cover a period of five months, from June to October, inclusive.

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1,022,564. Automobile Horn. Willard Pennock, Minerva, O. Filed July 10, 1911. Serial No. 637,804. (Exhaust horn). 3 claims.

1,022,567. Resilient Hub for Vehicle Wheels. Earl J. Seifried and Isaac G. Seifried, Findlay, Ohio. Filed Feb. 13, 1911. Serial No. 608,432. (Hub bearing mounted on helical springs.) 6 claims.

1,022,634. Electric Searchlight for Automobiles. Charles A. Lewis, Denver, Col. Filed Aug. 8, 1910. Serial No. 576,039. (Relative position of the carbons controlled by a single solenoid and suitable clutches). 6 claims.

1,022,639. Brake. Frank O'Brien, Jackson, Mich., assignor to the Lewis Spring & Axle Co., Jackson, Mich., a corporation of Michigan. Filed Sept. 18, 1911. Serial No. 649,860. (Contracting band brake.) 7 claims.

1,022,648. Spring Wheel. Elmer E. Wickham, Windsor, Mo. Filed Dec. 10, 1910. Serial No. 596,702. (Helical springs incorporated in the spokes.) 1 claim.

1,022,651. Buffer for Automobile Doors. Lewis A. Bedard, Boston, Mass. Filed July 12, 1911. Serial No. 638,092. (Plunger in a recess caused to protrude by helical spring.) 1 claim.

1,022,658. Tire Guard. Charles Dabelstein, Detroit, Mich. Filed Oct. 14, 1911. Serial No. 654,588. (Scraper arranged to remove objects calculated to cause punctures.) 4 for Motor Vehicles. James W. Packard, Lakewood, N. Y., assignor, by mesne assignments, to Packard Motor Car Co., a corporation of Michigan. Filed April 20, 1906. Serial No. 312,823. (Control levers and attachments.) 7 claims.

"Ribbon" a New F & S Bearing.

Combining remarkable simplicity with solidity of construction in a manner to obtain a number of desirable features, Fichtel & Sachs, of Schweinfurt, Germany, manufacturers of F & S radial and thrust



F & S "RIBBON" RETAINER

ball bearings, of which the J. S. Bretz Co., of New York City, is the sole American importer, have brought out not only a ball retainer, aptly styled the "Ribbon" retainer by reason of its construction and shape, which is quite different from anything else of its type, but has evolved a new self-aligning radial ball bearing.

As its designation implies, the retainer virtually is a continuous ribbon of steel; it is a one-piece sheet steel stamping that is drawn and formed without joints or rivets in its construction. Needless to add, it is very light, lighter, in fact, than the die-cast aluminum separator which has been used to such good purpose in F & S bearings, thus necessitating a slight decrease in number. But inasmuch as the load capacity varies directly as the square of the ball diameter, and with the number of balls, it may be appreciated that the increase in the size of the balls possibly more than compensates for the slight decrease in number; as a matter of fact, it is pointed out by the makers, that the load capacity for given sizes of bearings has been increased in some cases by as much as 30 per cent. Another of the advantages of the "Ribbon" retainer is that its construction permits better circulation of the lubricating medium and practically prevents the retention of foreign matter in the bearing.

The new radial bearing is essentially a standard bearing with a slightly spherical inner surface to its outer race; the addition of a washer with a spherical inner surface permits of automatic adjustment for slight shaft disalignment.

Substitute for Glass in Windshields.

For the ostensible purpose of eliminating the glass in windshields and with it the danger of damage in collision, a new product which is styled "non-flam Exonite" and appears much like celluloid just has been placed on the British market by Dover, Ltd., of Northampton. The new material is slightly clearer than celluloid and is considerably tougher and with a higher glaze, that resists scratching to a marked degree. When ignited, it burns out almost immediately, the burned portion being confined to a small area. It is made in five thicknesses in oval and round panels and in sheets measuring 53 x 24 inches.

Experimentation with Aluminum Wire.

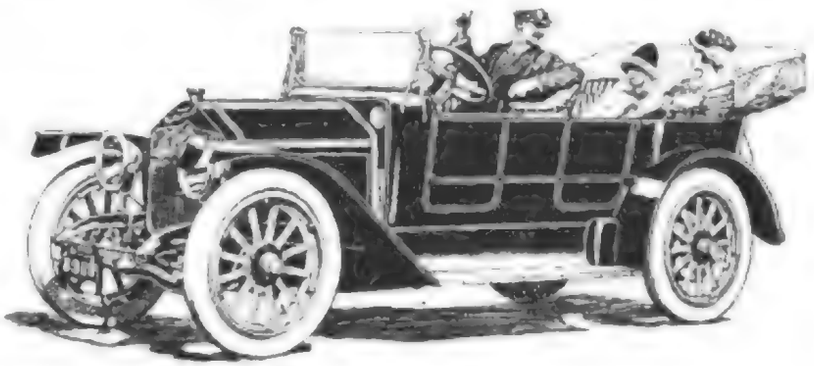
The cost of copper wire used in the wind-

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Stock Champion *International Champion*

National 40

Improved Series V $2750 to $3400 Five Models



A Work of Art

ARTISTS add rare beauty and luxury to your National car after the mechanical engineering experts have perfected its power, reliability, ease of control, and serviceable qualities.

For luxury and utility you find the National the criterion.

Long stroke motor (4⅞ x 6), left-side drive, center control, Gray & Davis electric starter, Gray & Davis dynamo electric lighting system, Bosch double dual magneto, multiple jet carburetor, 12-inch Turkish upholstery, tire pump integral part of motor, 128-inch wheelbase, Hoffecker speedometer, full floating rear axle, concealed baggage compartments, tire carriers, full heavy nickel trimmings, powerful brakes, perfect oiling system, robe rail, foot rest, foot mat in running board, concealed tool box, electric horn, top, curtains, Truffault-Hartford Shock Absorbers in rear, adjustable ventilating and rain vision windshield and one extra Firestone demountable rim.

National Motor Vehicle Company, Indianapolis, Indiana

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The Atwater Kent Ignition System

has been silently advertised from coast to coast by the best advertisement any product can have—the personal endorsement of over 100,000 satisfied motorists.

During the period of the magneto craze, we could have taken advantage of this fad and manufactured magnetos. Due to our facilities and prestige, we could undoubtedly have produced and sold large quantities of them. We knew, however, that the Atwater Kent System was fundamentally correct in principle and that it was better than any other ignition device. This opinion was also shared by thousands of our friends who discarded the magnetos on their new cars and installed the Atwater Kent, claiming they got much better results with much less trouble.

You can't equip your car with a more reliable ignition system than the Atwater Kent—no matter what amount of money you are willing or expect to pay for it. Why then take chances by investing in other equipment when by installing the Atwater Kent System you close every avenue to future regret?

Just a few of the many good features of the Atwater Kent System and its advantages over the magneto:

The spark is of constant heat quality irrespective of the speed of the engine, thereby enabling the engine to be run at a very much lower speed if desired.

The simplicity and accessibility of the different parts of the Uni-Sparker are much greater than in the case of the magneto.

The adjustment of the platinum contacts does not affect the timing of the spark.

Easy adjustment to lengthen or shorten the spark, thereby insuring the maximum economy of battery current.

Low maintenance cost and repair expense. Will start engine on spark. Duplicate ignition system not necessary. Light weight. No magnets to become demagnetized. Unlimited range of spark advance or retard. Low initial cost.

In connection with the standard Type F System, we are furnishing a new model—Silent Type K with automatic spark advance and insulated primary circuit, especially designed for use in connection with lighting and starting equipment.

PRICES OF THE TYPE F SYSTEM

	Standard Coil	Kick Switch Coil
1-cylinder	$17.00	
2-cylinder opposed	18.00	
2-cylinder distributor type	22.00	$24.00
3-cylinder distributor type	25.00	27.00
4-cylinder distributor type	25.00	27.00
6-cylinder distributor type	27.00	29.00

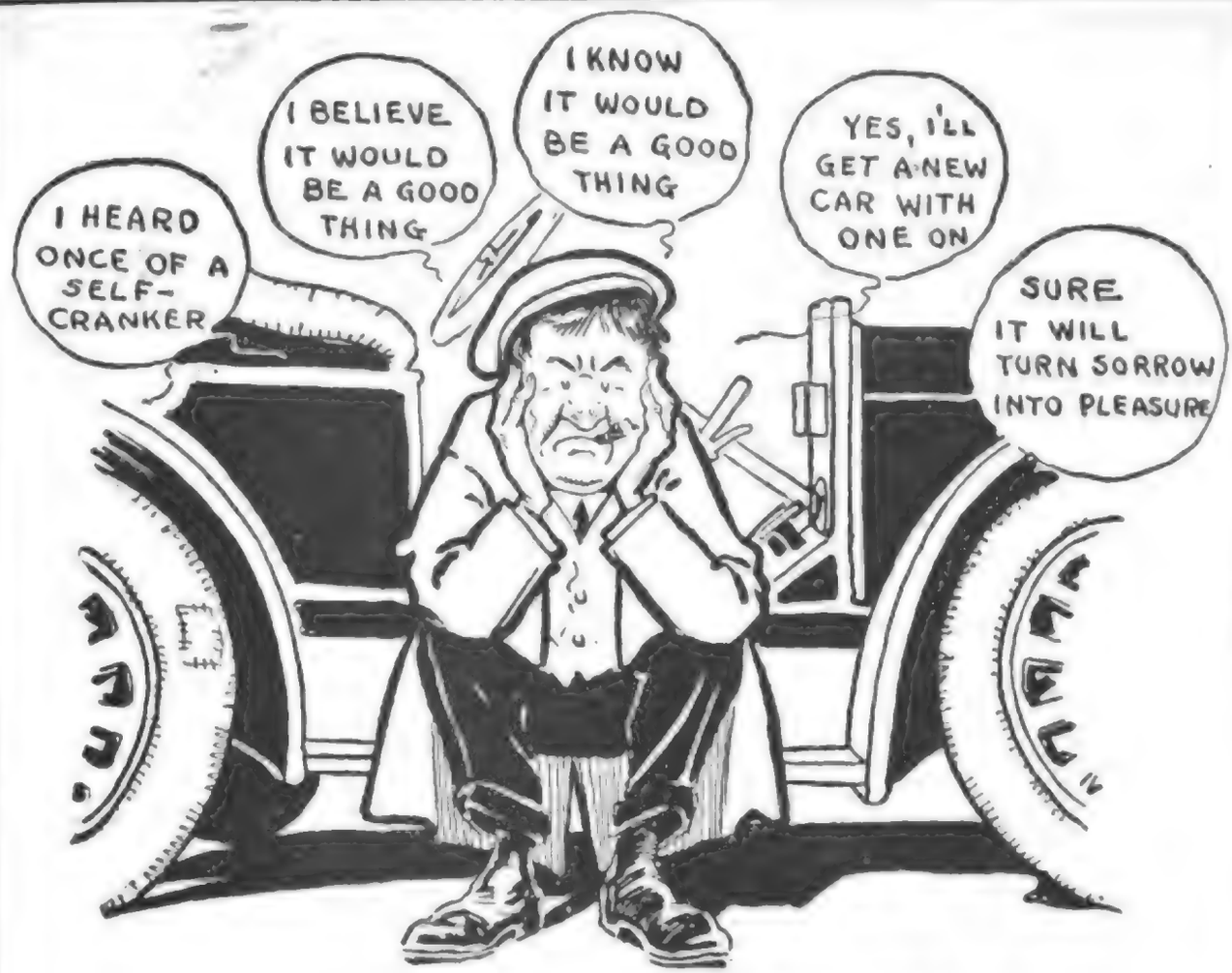
PRICES OF THE TYPE K SYSTEM

	Standard Coil	Kick Switch Coil
2-cylinder	$32.00	$35.00
3-cylinder	35.00	38.00
4-cylinder	35.00	38.00
6-cylinder	37.00	40.00

If you have an unsatisfactory magneto, or if your engine has no timer shaft, you can use the Atwater Kent System by means of a special "magneto gear mounting," the cost of which is $5.00 in addition to the above prices.

Possibly all that car of yours needs to give perfect service is an Atwater Kent Ignition System

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ALL IN—DOWN AND OUT

How often, after cranking your head off, without getting your car started, have you felt like this gentleman? Oh, yes, he *was* a gentleman a short time ago, but he doesn't look like one now, we'll admit.

See That Your 1913 Car Has An Electric Cranker

and you can always *look* like a gentleman whether you are or not. But be sure, for efficient, long-lived service, that your electric equipment is operated from an

LBA

STORAGE BATTERY

Use the Class A LBA Battery with an Electric Lighting Generator
Use the Class B LBA Battery with an Electric Self-Starter

Write us for full information

Willard Storage Battery Co.

CLEVELAND, OHIO

New York Branch—136 West 52d Street
Detroit Branch—1191 Woodward Avenue
Chicago Branch—2241 Michigan Ave.
San Francisco Branch—243 Monadnock Bldg.

Depots in all Principal Cities in the United States, Canada and Mexico

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Elyria-Dean
TRADE MARK



REXO HORN
Electric Warning Signal
GUARANTEED

Electric Warning Signals

Will be standard equipment on most automobiles for 1913

Our present enormous sales prove beyond any question of doubt that the bulb horn must pass into the realm of antiquity.

The Tuto, Tutoette and Rexo electric warning signals, manufactured by us meet the needs of all types and sizes of cars manufactured.

FOR the medium priced car the Rexo horn, made to retail at $8.00, meets the requirements for a guaranteed, reliable, single-tone electric warning signal.

It is instantly responsive and of uniform intensity. It is free from constant care and most effective for emergency, yet not too loud for regular service.

The Tuto two-tone electric warning signal is the highest grade and most complete warning system yet devised.

It electrically transmits two distinct tones, a low note for service and a loud note for emergencies or touring, the degree of sound being regulated by the pressure of the thumb upon a button located on the steering wheel, directly under the hand of the motorist.

These horns are built upon modern electrical principles in everyday use upon thousands of telephones throughout the world. They are reliable, positive, certain.

Either horn can be connected to any ordinary 6-volt battery.

Manufacturers that are now making their plans for 1914 will find it worth their while to get in touch with us.

WE WILL EXHIBIT AT THE CHICAGO PLEASURE CAR SHOW
SPACES 170-171, SECOND FLOOR, COLISEUM ANNEX

Elyria-Dean Products Manufactured Only By

The Dean Electric Company

501 Olive St., Elyria, Ohio, U. S. A.

San Francisco, Cal. **Kansas City, Mo.**

"Look for Elyria-Dean where quality's seen"

Elyria-Dean
TRADE MARK



The Elyria-Dean Speedometer

Is the most simple and permanently accurate speed measuring mechanism yet devised

It operates on the **unvarying** principle of centrifugal force ***direct*** **without** being hampered **with compensating** gears, springs, etc.

The action is the **same on the coldest** winter day as in **the heat of summer.** There is no necessity **for temperature** compensators or **means for steadying** the hand.

THE hand is always steady, regardless of road conditions or speed of car, owing to the equi-balanced construction, and shows the speed at a glance by its position and without the necessity of deciphering the figures or marking, the latter being larger than usual for a speedometer of the same diameter.

The odometer is the reliable Geneva movement with trip reset to any one-tenth mile so as to follow guide-book markings.

They always add mileage, never subtract regardless of how the car runs, whether forward or backward, or whether the shaft is driven from the right or left hand wheel.

Elyria-Dean Speedometers respond to the slightest increase in speed.

The dial is **black** with white markings, the case beautifully finished in baked black enamel with nickel trimmings.

Every detail has been so nicely perfected that the complete instrument is in strict keeping with the finest made and most luxurious automobiles.

The Elyria-Dean is the **big idea** in speedometers.

WE WILL EXHIBIT AT THE CHICAGO PLEASURE CAR SHOW.
SPACES 170-171 SECOND FLOOR, COLISEUM ANNEX

Elyria-Dean Products Manufactured Only By

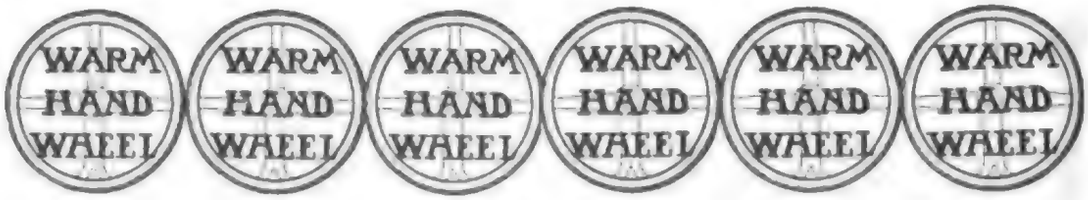
The Dean Electric Company

501 Olive St., Elyria, Ohio, U. S. A.

San Francisco, Cal. **Kansas City, Mo.**

"Look for Elyria-Dean where quality's seen"

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Be a Warm Hand Wheel Dealer

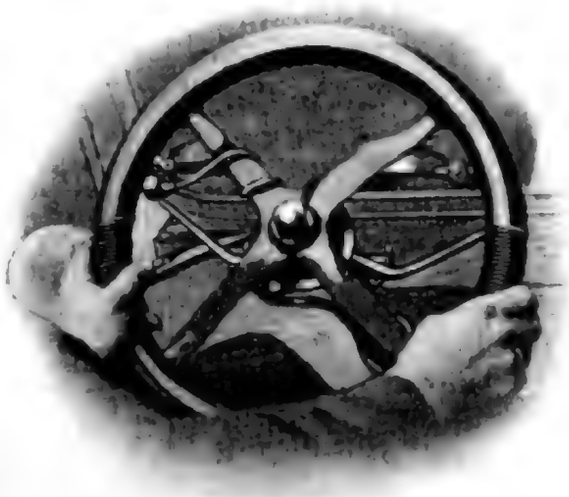
Don't allow your chance to slip. Next week some live wire competitor may be cutting out the big melon slice that you might be enjoying right now. The name and fame of this device is spreading rapidly. Get your territory.

We show here the Warm Hand Wheel with the circuit open and closed. Note that a simple movement of the connection on the left of the wheel will turn the current off or on at will.

The Warm Hand Wheel will impart a grateful warmth to the driver's hands no matter how cold the weather or how high the speed. It makes winter driving a pleasure and so promotes the use of cars that would otherwise remain in storage during the cold months.



Circuit Open



Circuit Closed

Current consumption is low and the wheel is kept warm through either battery or lighting systems, while Ford owners will find the built-in flywheel magneto ideal for this purpose.

You can install the Warm Hand Wheel in short order, scarcely any work being necessary to "get it going."

Retail price is $15 and your share in the transaction most liberal. Practically no effort is necessary to make a sale. The Warm Hand Wheel just about sells itself.

Get Your Territory Now

THE WARM HAND STEERING WHEEL CO.
527 Fifth Avenue **New York**

NEW DEPARTURE BALL BEARINGS

American Made for American Trade

Gasoline Is Going Up---

and the users of motor vehicles are paying the bills. Abroad, where gasoline costs half-a-dollar a gallon, builders of automobiles use only ball bearings.

Why?

Because ball bearings are more thoroughly anti-friction than any other type. Friction scarcely exists in ball bearings, hence less power and less fuel are required to drive mechanism mounted on such bearings.

Other advantages are:

Minimum wear:

Maximum efficiency, endurance and dependability;

Ease of replacement;

Freedom from necessity of frequent adjustment – ball bearings are fool-proof.

The prospective automobile buyer will favor the car that will cost him the least to operate and maintain. This means he will favor the car that is equipped with ball bearings.

The American made New Departure ball bearings have no superior are strongly guaranteed and perferred by the majority of American automobile manufacturers.

One such manufacturer says: "More real bearing value than I can get out of any other bearing."

You are invited to visit our exhibit, Space No. 204, Balcony, Madison Square Garden

New Departure Manufacturing Company

Bristol, Connecticut

Double Row
Single Row
"Radax"

CUBIT



ELECTRIC HORN

$3.00

A Good Horn at a Low Price.

In Black Enamel, very High Gloss.

Weighs Two Pounds and a Half.

Consumes very little current (1½ to 2½ amperes).

Emits high toned Musical Blast.

Has no working parts to get out of order.

Has no VIBRATOR, the diaphragm is the Armature.

Requires no Oil. Runs on SIX VOLTS.

Gets better with age as the "Bulging" of the diaphragm which is detrimental to other horns makes the "CUBIT" more efficient.

Push button and wire that retails for $2.00 packed in separate box, 35 cents extra.

NONPAREIL HORN MFG. COMPANY

73-75 Wooster Street *Eastern Distributor* **NEW YORK CITY**

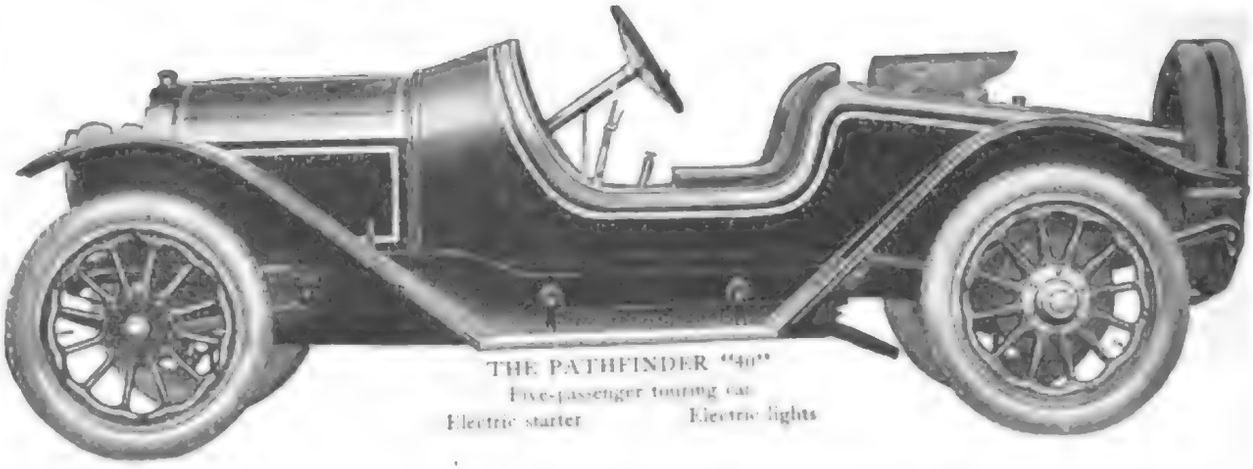
KOSMAK ELECTRICAL CO. Office and Factory, 209 Ocean Avenue Factory, 17 Stevens Avenue **Jersey City, N. J.**

Branch Office, Ford Building, Detroit



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You saw the Pathfinder at the New York Show



THE PATHFINDER "40"
Five-passenger touring car
Electric starter Electric lights

NOW — sit down before you forget and write for Agency Particulars. We give you—

A motor car with a talking point in every component part—a proved superior value.

Shoulder-to-shoulder co-operation of our entire Selling and Advertising organization in pushing sales.

The prestige that goes with representation of the official car of the U.S. Government and A. A. A. in their joint survey of three trans-continental highways in six months.

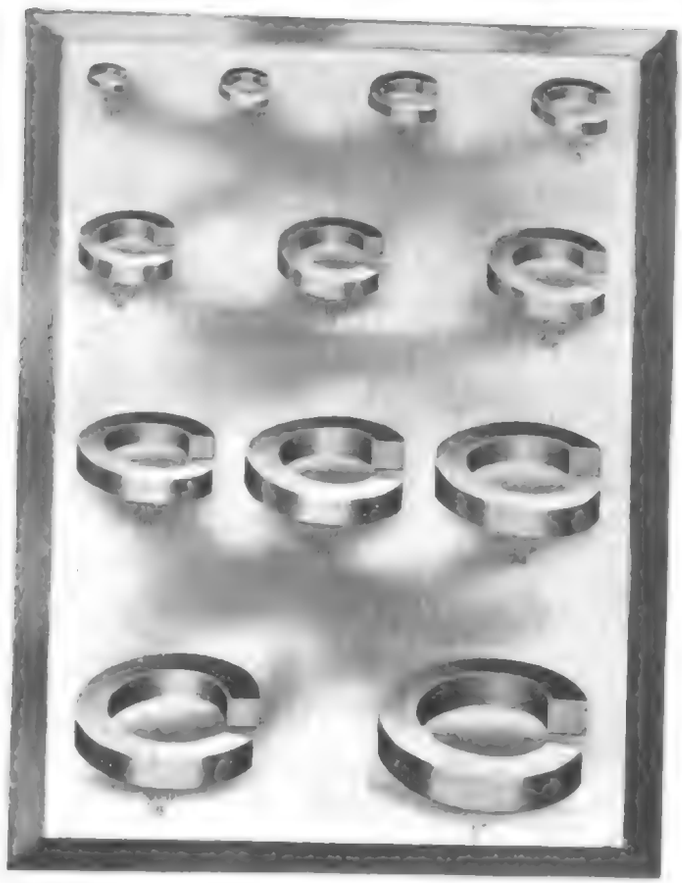
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NATIONAL AUTOMOBILE LOCK WASHERS

SUPERIOR

QUALITY

COUNTS



LOCK WASHERS SHOWN IN PANEL HAVE BEEN ADOPTED BY THE SOCIETY OF AUTOMOBILE ENGINEERS

The lock washer is a small car part with a mighty big mission. It is evident that this is not realized by the consumer, for in this item the order usually goes down—"get quotations on lock washers."

The lock washer is the bond of the units. If it lacks proper resiliency then it is inefficient and will destroy alignment of bearings and create small or grave troubles in various parts.

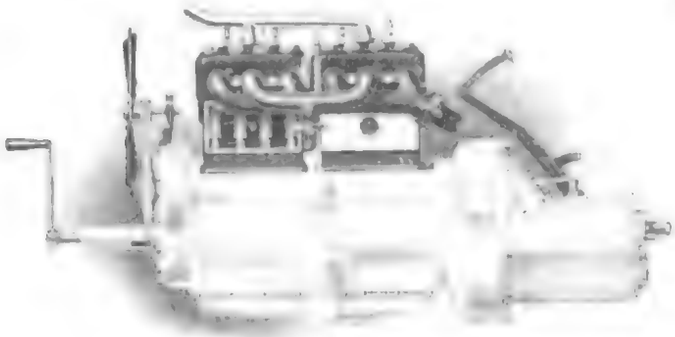
The responsible purchasing head (the one we want to reach) will order lock washers that will insure security of parts—and he won't hesitate on a few-cents-per-car-difference.

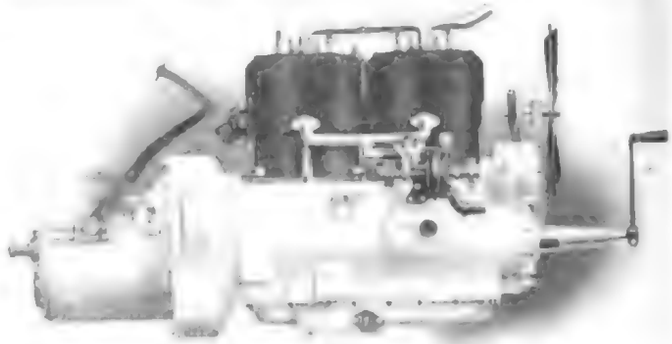
National Lock Washers are 100 pe· cent. proficient.

THE NATIONAL LOCK WASHER CO. Chicago, Ill. Newark, N. J.

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ERGON MOTORS





No matter what you expect from an Ergon motor, you'll be greatly surprised when you see one and put it to the test.

From a standpoint of efficiency, quietness, sturdiness, and above all accessibility it will tax you to find the equal of this motor at anywhere near the price we can quote.

Not only are we putting our own very best efforts and brains into this motor but whenever we have used a part made outside our own factory—or when we have gone outside for an operation of any sort—we have dealt only with accepted and acknowledged leaders in their respective fields.

For example, some of the contributors to Ergon Motors are The Driggs-Seabury Ordnance Corporation, Brown-Lipe Gear Co., Timken Roller Bearing Company, F & S bearing importers, and Hans Renold, of silent chain fame.

Let us get in personal communication with your requirements. Let us demonstrate our standing both as to product and deliveries thereof.

HAZARD
MOTOR MANUFACTURING COMPANY
ROCHESTER, NEW YORK



The Man in the Box

¶ An air of mystery pervades the carbonizing department of the Timken Plant. Smoke rises from rows of glowing furnaces. Red, white and green signal lights shine through the haze. 'Devil wagons' dive into lurid ovens after red hot pots of carbonized parts.

¶ And off in a corner, quietly watching and guiding it all sits the 'man in the box.'

Timken Tapered  Roller Bearing

¶ To the carbonizing room come all the cups, cones and Rollers for the Timken Bearing. Accurately made as they are, from the best of steels, by the finest automatic machinery, they are far from fit for service in the motor car.

¶ In this huge room the parts are carefully packed in iron pots with a mixture rich in carbon. Then heated in furnaces to just the right temperature for just the right length of time.

¶ Carbon from the black mixture penetrates the skins of the cups, cones and rollers so that, later, the surface of each part can be made glass-hard to resist wear while the core remains soft and elastic to withstand shocks.

Time-Tried Formulas

¶ The time in the furnace and the degree of heat, vary for each particular size of cup, of cone, of roller. The exact formula for each has been developed by years of experiment and study.

¶ The formulas have been proved right by minute records of results in service. Records that cover millions of Timken Bearings in hundreds of thousands of cars.

Must be Followed

¶ It's the duty of the man in the box to know that the formula for every size of every part is followed exactly by the furnace men. And this is how he knows it:

¶ Wires lead from an electric resistance thermometer in each furnace to a switchboard in his box. Every quarter hour he connects each oven with the pyrometer before him, reads and records its heat and compares it with the formula for the size of the part that particular furnace contains.

¶ Other wires from the box carry order signals back to each oven. Red, white and green lights tell the furnace man to slightly raise or lower the heat or to hold it as it is.

Correct Design Won First

¶ Years ago no such painstaking care was used in making the Timken Bearing. Yet even in those days its unique design was right—its principles have never been changed. They have proved right in the crucible of service.

¶ But years of striving towards perfection in every process of manufacture have added to rightness of design a very real though a less important value.

The Timken Roller Bearing Company

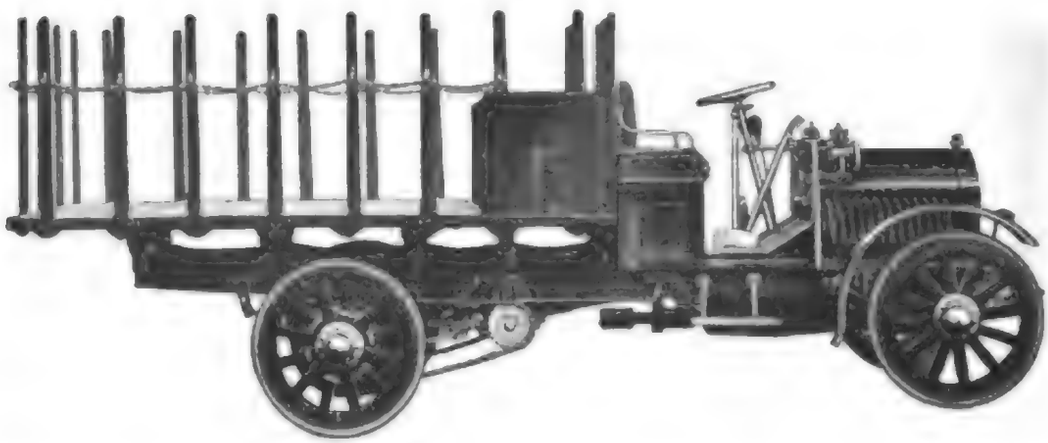
Canton, Ohio, U. S. A.

The only axle manufacturer licensed to make automobile axles equipped with Timken Roller Bearings is the Timken-Detroit Axle Company

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THE SELDEN TRUCK

$2000



With a proper conception of just what constitutes an efficient commercial car, the manufacturers of the Selden One-Ton Truck have produced a car that stands out conspiciously as the leader of its class.

While it embodies the same principles of construction as those found in the best trucks on the market, it is distinctive in that it is stronger and has a larger factor of safety than other trucks of like capacity.

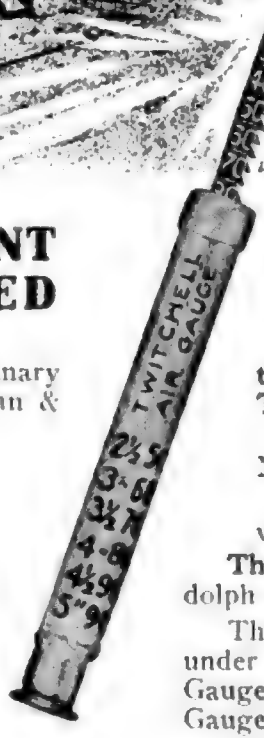
The Selden Truck is built not merely to sell but to do its work and do it satisfactorily day in and day out, with the least trouble and expense to the user.

The Selden Truck is Easy to Buy and Easy to Pay For

In order to put the commercial car within easy reach of all those who need it, but who find it inconvenient to take from their business the necessary funds with which to pay spot cash, we have inaugurated a partial payment plan that removes the last obstacle in the way of thousands of prospective buyers.

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TWITCHELL PATENT AGAIN SUSTAINED

On December 18, 1912, a preliminary injunction restraining E. Edelmann & Co., of Chicago, from the manufacture, sale and use of the Edelmann Economy Gauge was issued by Judge Humphreys in the U. S. District Court for the Northern District of Illinois.

This injunction, issued against vigorous opposition by E. Edelmann & Co., is the outcome of a suit charging infringement of Twitchell patent No. 927,298, dated July 6th, 1909, and is the last of an unbroken series of victories won over a host of unscrupulous imitators by the Twitchell Tire Pressure Gauge.

The makers of the Twitchell gauge desire to warn the trade that the sale or use of any tire pressure gauge infringing the Twitchell patent is as much an infringement of the Twitchell patent as the manufacture of the gauge itself and as such will be vigorously prosecuted.

EDELMANN GAUGE ENJOINED

The following gauges have been held by the courts to be infringements of the Twitchell patent:

The Northam Gauge—Twitchell vs. Northam Auto Pressure Gauge Co.

The Prest-O-Lite Gauge—Twitchell vs. Prest-O-Lite Co.

The Safety Tire Gauge—Twitchell vs. Rudolph & West Co.

The only gauges licensed for use or sale under the Twitchell patent are the Twitchell Gauge, the Schrader Universal Tire Pressure Gauge, and the Allen Tyrometer.

The makers of the Twitchell Gauge take this occasion of assuring jobbers, dealers, and the trade generally, that the sale of the Twitchell patent to A. Schrader's Son, Inc., will in no way affect the manufacture or sale of the Twitchell gauge. Advance orders already on our books warrant us in saying that our output for 1913 will be more than double, compared with 1912. There is a rapidly growing demand for Twitchell Gauges with the positive Lock-Stop. This construction securely locks the indicator bar until released by pressure of finger at top.



"TIRE INSURANCE FOR $1.00"

THE TWITCHELL GAUGE CO., 1202 Michigan Ave., Chicago, Ill.

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BOSCH

Predominates—Of Course

OF the 93 makers of cars exhibiting at the New York Shows, the following is a list of those on whose products Bosch Magnetos were fitted. And is

Convincing Bosch Argument

Winton
Mitchell
Locomobile
Peerless
Stevens-Duryea
Stoddard-Dayton
Pope-Hartford
Franklin
Lozier
Overland
Pierce-Arrow
Packard
Marmon
Garford
Columbia
Moline
Pullman

Alco
Mercer
S. G. V.
Cunningham
Knox
Moon
Matheson
Selden
National
R. C. H.
Bergdoll
American
Speedwell
Paige
Krit
Inter-State
Velie

Henderson
Kline
Hupp
Fiat
Metz
Case
Pathfinder
Detroiter
Minerva
De Dion Bouton
Lancia
Renault
Mercedes
Daimler
Isotta
Metallurgique
Panhard

NO argument, no proof, no claim is so thoroughly convincing as is the showing of universal selection—the greatest engineers of the industry acknowledge the superiority of Bosch—the extensive adoption of this method of ignition is the climax of supremacy proof.

For 1913 **Be Satisfied** **Specify Bosch**

BOSCH MAGNETO CO., 223 West 46th St., New York

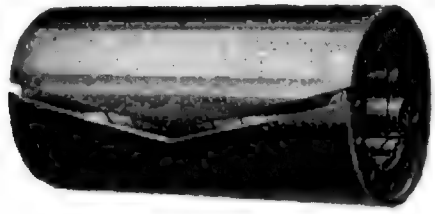
CHICAGO **DETROIT** **SAN FRANCISCO** **TORONTO**

Official Distributors in all important centers of U. S. and Canada.

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Hyatt Quiet Bearings



The Standard Type of the Hyatt Roller Bearing is designed with generous bearing length. This permits the rollers to operate directly on a steel shaft, thereby simplifying the construction.

The flexibility of the Hyatt Roller affords full line contact, hence an equal distribution of the load along the entire length of the bearing. Overloading at any particular point, causing excessive wear, is thus avoided.

The rollers of the standard type are now made of Chrome Nickel Steel, resulting in a greatly increased carrying capacity. Lubrication is positive—the rollers forming oil reservoirs. The right and left spirals distribute oil to every part of the bearing. Grit and dirt work through into the center of the hollow rollers, thus preventing grinding which would result in wear.

These are exclusive features of the Hyatt Roller Bearing.

HYATT ROLLER BEARING CO.
DETROIT, MICHIGAN

The Delivery Car That Has "Made Good"



Lippard-Stewart

The Delivery Car

CHASSIS

List - - - $1650

BODIES

Standard Panel - $150
Standard Express 125

The Lippard-Stewart Model "P" 1500 Lbs. Delivery Car—30 H.P.

When You Choose a Delivery Car select it as you would an employee who is most vital to your business. Go over its past record. Find out what it has done for others—what it will do for you. Analyze the car in every detail. Not merely its outward appearance but every detail of its construction. Know your car—know its makers—know its ability to fulfill your requirements. Intuition may tell you that the Lippard-Stewart is a good car, but analysis, comparison with other cars, past record and logical reasoning will prove to you that it is the peer of all cars for light delivery purposes.

Sound Commercial Car Construction is the basis of the Lippard-Stewart's supremacy. It is purely a delivery vehicle. Designed and built a commercial vehicle from tires to top, from tailboard to headlight. It represents the practical ideals of men who have made a careful study of transportation and delivery problems. That is why it fulfills the demands of every business man or company whose need is a prompt, efficient and economical delivery system. It has demonstrated in almost every instance that it will deliver more goods over a wider territory than is possible with horse and wagon. Its dependability is a proven fact. It does its work well in fair weather and foul and is ready for every emergency.

of greatest stress. Note the 30 Horse Power Continental Motor. Consider the rugged cone clutch and the transmission strong enough for a 50 H.P. Car. Observe the shaft drive, the differential, the simplicity of construction practiced throughout the entire building of the car—the easy get-at-ability of every important mechanical part even when the car is loaded. Look at the perfect spring suspension that assures easy riding and minimizes wear and tear. Then

Consider the Price of the Car—its sound dollar for dollar value. Compare it with any car apparently competing with it. Note how the Lippard-Stewart Car actually baffles competition. If you are a prospective purchaser, note the real worth of the car. If you are a dealer, form your own conclusions as to the car's value as a business investment—its ready salability and the quick turnover of capital it assures.

Note the Comprehensive Lippard-Stewart Line—the volume of sales it makes possible—a line that offers you a car to meet the specific demands of practically every firm and individual who need a delivery car regardless of their business—a line that knows no dull seasons and a car that practically sells itself and stays sold winter or summer.

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THE LARGEST AUTO SUPPLY HOUSE IN AMERICA

Our Name Is Your Guarantee

WHATEVER you buy from the house of CHAS. E. MILLER you may expect the fullest degree of satisfaction in every detail. Quality, quantity, material, workmanship, durability will be just right or we will make it right. Our name is your guarantee.

To buy from a house the size and standing of this one is the safest way to insure complete satisfaction in all your dealings. We handle goods of **standard quality only** and of course stand back of everything we sell.

No matter what you want in the line of automobile accessories or supplies, remember our slogan, "We Either CARRY IT IN STOCK, WILL GET IT—OR IT ISN'T MADE." One of the prize winners in MOTOR'S recent advertising contest selected this as the slogan out of the many shown. His reason was as follows: "This saying is the clearest possible statement of the Miller business policy which I have found to be a fact through several years of satisfactory relations with them."

Our Annual Catalog is the largest, most complete, up-to-date and authoritative dictionary of the auto supply market of any book published. It has come to be recognized as one of the standard reference works of the industry.

The total distribution of one hundred thousand copies of this catalog practically covers the world, at least wherever automobiles are used. Nearly all foreign as well as domestic automobile manufacturers and dealers, the offices of American Consuls, Public Libraries, Universities, Y. M. C. A. Schools, Publishers, Automobile Clubs, Engineers' Offices, Purchasing Departments—in all these places you will find a copy of the Miller catalog on file.

Fifteen branches spread over the United States, located in the principal motoring centers, bring Miller service within the reach of practically every motorist in the United States. Prompt delivery, perfect quality, honest prices—these are the things that distinguish Miller service and explain the marvelous growth of this pioneer establishment since its inception in 1896.

CATALOG MAILED TO ANY ONE ANY PLACE ON REQUEST

Chas. E. Miller

Manufacturer, Jobber, Exporter and Importer

ESTABLISHED 1896

Home Office: 97-99-101-103 Reade Street, New York City

ORDER FROM NEAREST BRANCH, ADDRESS CHAS. E. MILLER

NEW YORK CITY 97-103 Reade St.	BROOKLYN, N. Y. 1421 Bedford Avenue	BOSTON, MASS. 202-204 Columbus Ave.	DETROIT, MICH. 227-229 Jefferson Ave.	ATLANTA, GA. 259 Peachtree Street
NEW YORK CITY 924 Eighth Avenue	BUFFALO, N. Y. 824 Main Street	SPRINGFIELD, MASS. Bridge and Dwight Sts.	CLEVELAND, O. 1829 Euclid Avenue	NEW ORLEANS, LA. 601-603 Baronne St.
NEW YORK CITY 2782 Broadway	ALBANY, N. Y. 135 Central Avenue	HARTFORD, CONN. 274 Trumbull St.	PHILADELPHIA, PA. 318 North Broad St.	NEWARK, N. J. 274 Halsey Street

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STANWELD Rim No. 30 is designed for those who require a demountable rim of minimum weight and extreme simplicity.

It has both the quick detachable and demountable features and is made in two styles, one for straight side tires and one for clincher.

This rim is split circumferentially, the two sections having corresponding lugs that are locked together by two semi-circular rings. One end of each ring is securely rivited to the wider portion of the rim base. The free ends of these rings are secured by a swinging latch which is in turn locked by a cam latch.

No special tools are required to operate this rim and no circumferential movement of either section is necessary to disengage the two parts of the rim base.

The rim base of STANWELD Rim No. 30 will fit the felloe band of either the Continental Gilbert type rim or the Standard Universal No. 3 rim, without requiring any special wheel work or additional equipment.

The Standard Welding Co.

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STANWELD demountable rims, series No. 40, stand alone in their pre-eminent efficiency.

Universal in their acceptance of tires, automatic in their mechanical operation, combining both a quick detaching and demounting feature which operate independently, and positively preventing wobbling of tires, they surmount all the defects of former types of demountable rims.

STANWELD rims, No. 40 series have an entirely new feature for the securing of the rim base to the wheel —The adjusting ring. This device is an intermediary band that lies under the entire rim base and supports it at all points of the front and rear circumference.

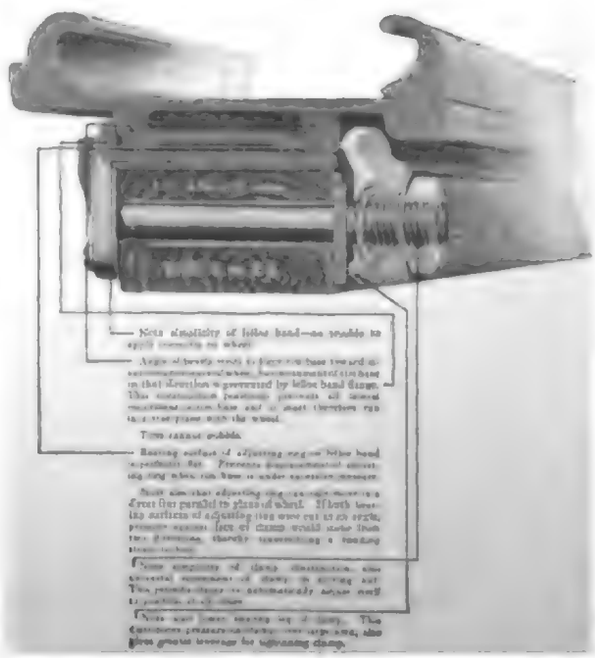
The rim base has the felloe band flange as a guage for its lateral position and must always lie in the same perfect position on the wheel no matter how the clamping devices are tightened. This is the preventive of tire wobbling, one of the prime reasons for excessive tire expense.

Number 40 STANWELD rims are the wheel equipment on all leading makes of cars.

The Standard Welding Co.

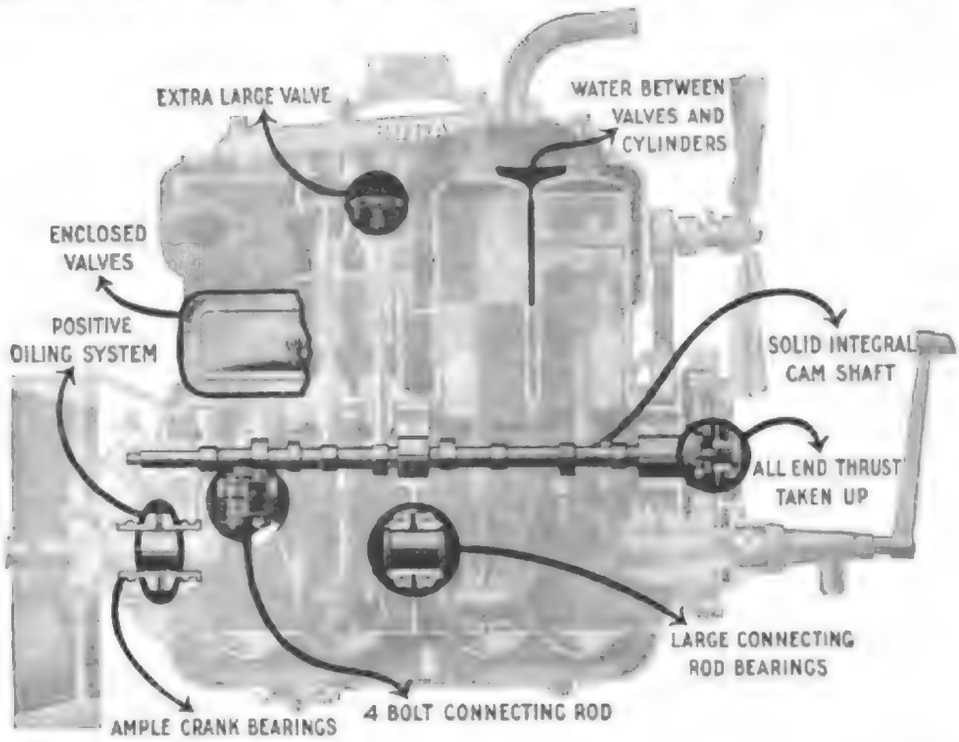
Cleveland, Ohio





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You Automobile Engineers:
Cast Your Trained Eyes on This



You twice-blessed fellows who, in case of an accident, can "disembowel" a car—put its "innards" back again—tickle the carburetor and be off—you will appreciate this sectional photograph of the

Pleasure Cars:

Hudson Motor Car Co.
Michigan Motor Car Co.
Henderson Motor Car Co.
Lenox Motor Car Co.
Schacht Motor Car Co.
Spaulding Mfg. Co.
Cruxton Motor Co.
Nova Scotia Carriage and Motor Car Co.
Miller Motor Car Co.

—and others.

BUDA MOTOR

Trucks:

Service Motor Car Co.
Bowling Green Motor Car Co.
Durant-Dort Carriage Co.
Hewitt-Ludlow Auto Co.
Tiffin Wagon Co.
Brantford Motor Truck Co.
W. Landshaft & Sons
Harvey Motor Truck Co.
Hurlburt Motor Truck Co.
Schacht Motor Car Co.
Chicago Pneumatic Tool Co.
Lord Baltimore Motor Car Co.
U. S. Government and others.

You know the reliability of a heat-treated crankshaft and with bearings large and with low pressure factor. You appreciate those large and enclosed valves. You instantly see the value of that special oiling device. All this is "grist to your mill."

To the rest of our friends, who are not mechanically inclined, we would simply say—those prominent manufacturers who are alive to the value of having a motor which is not merely *a part of the car to sell* but *the part that helps to sell the car* have selected the Buda. This is evidenced by the above partial list of manufacturers to whom we have sold motors.

The Buda "Little Six"

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The LUXURIOUS BROC

Dollars do not count—under these conditions

THE Luxurious Broc Electric is built without regard to expense.

Quality interests us before, and much more than, cost.

By that we mean that wherever efficiency, luxury or satisfaction could be added, cost has been—and is—no object.

Do not infer that we throw money away. Every dollar of manufacturing cost means actual value put into the car—in quality, and in satisfaction to the owner. There is no waste on non-essentials, nor by unscientific manufacturing methods. We buy value always.

The heart of the matter is this: When a maker would add to quality, he must add to cost. To court cheapness is to lower quality.

The best car cannot be a cheap car.

The perfection of The Luxurious Broc is due to this fact that costs are not feared. The Broc is not built to meet a price.

Our aim is the best car that can be built. We believe that we have achieved it. We believe that we can demonstrate this to you by showing you, in the car—in every part of the car—the quality we are talking about.

The forward drive model has pedestal front seats which are reversible to optional. Rear drive models provide pedestal or stationary front seats.

We will exhibit at the Chicago Show (space 87) February 1-8.

Exide or Ironclad Batteries.

The BROC ELECTRIC VEHICLE COMPANY

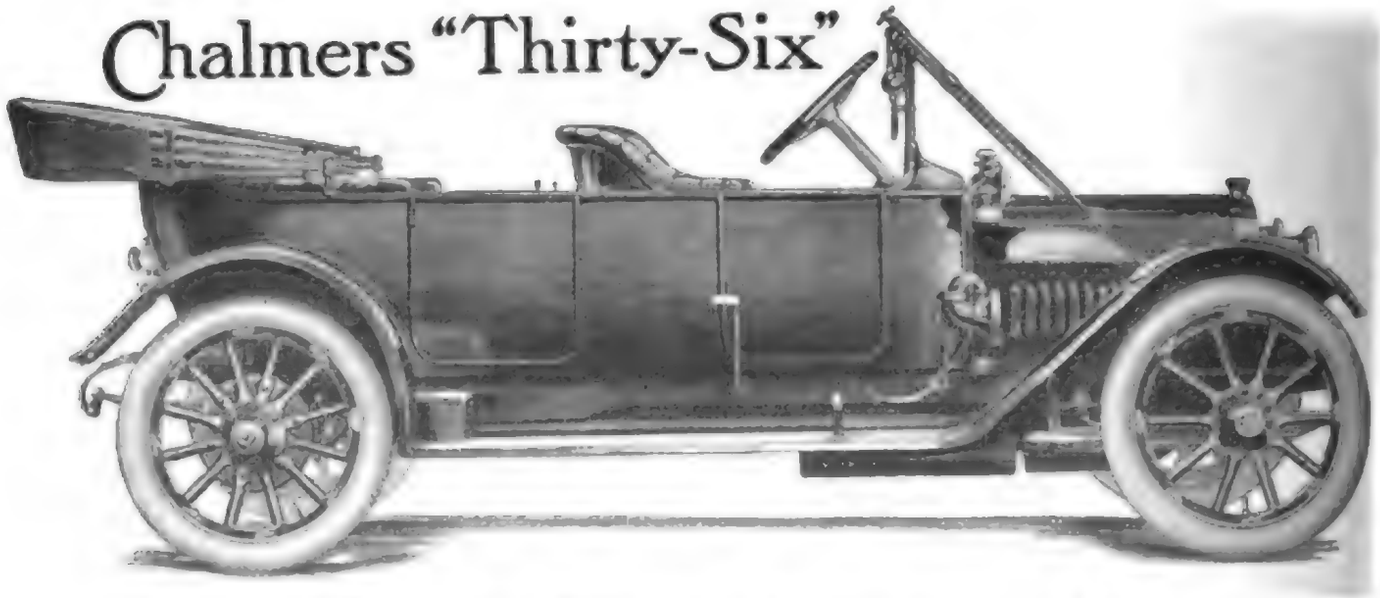
1677 East 40th Street, Cleveland



Model 20. Rear drive Brougham for five passengers, pedestal front seats. Roominess and comfort of limousine.

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Chalmers "Thirty-Six"



$1950 Can't Buy Any More Automobile Than This—the Chalmers "Thirty-Six"

MANY thousands of owners will tell you just what we say above—"$1950 can't buy any more automobile than the Chalmers 'Thirty-Six.'"

Many of them will go further. They will tell you that for real service and satisfaction you can't buy any more automobile for any price.

And these owners speak from personal experience. They have driven these "Thirty-Sixes" hundreds of thousands of miles. They have used them under every possible condition—of climate, roads, hills, city traffic, country touring. They know. So we feel safe in offering you their opinion as the biggest reason why you should buy a Chalmers "Thirty-Six."

When you examine this car carefully we For the "Thirty-Six" is a big car—nothing cramped or skimpy about it.

Every Convenience At Hand

And now note the convenience of starting. Everything necessary is within easy reach. The switch is turned on without even leaning forward. The carburetor is adjusted from the dash. Pressing a foot button puts the motor in action; for the Chalmers self-starter starts. If it is night, an electric switch turns on at will any or all of the lights.

As the car gets under way, note the wholesome, businesslike sound—as you pass from first speed to second, to third, to fourth speed. No noise, or grating, or clashing, no grinding, whirring sound as the car picks up speed. For Chalmers gears are ground to an accuracy of ½ of 1/1000 of an inch.

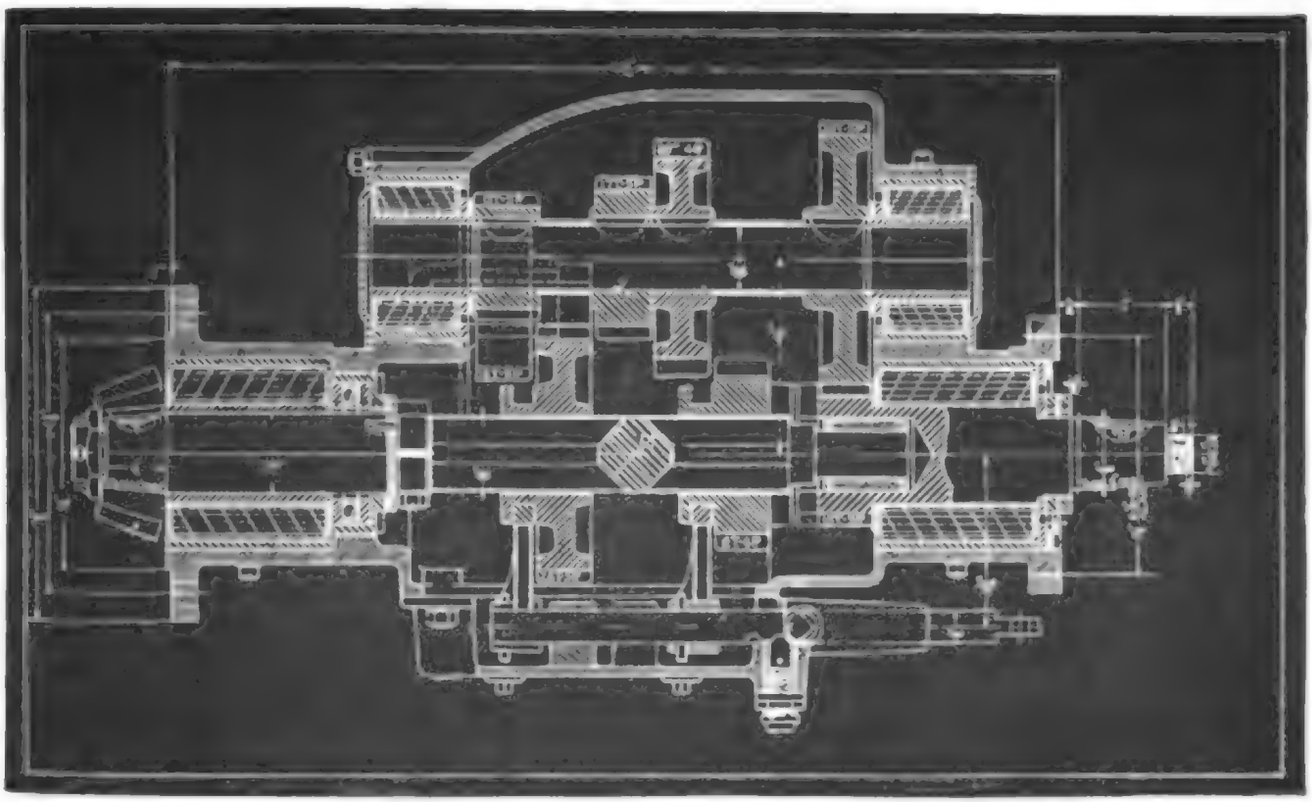
and roar. The "Thirty-Six" with its big wheels, big tires, long springs, solid, substantial construction—heavy enough, but not too heavy—gives you much the same comfortable and secure feeling as a Pullman car.

All day you can ride in a "Thirty-Six" without fatigue or strain, physical or mental. No shock or jar, no worry. Perfect safety, perfect confidence, perfect satisfaction are yours in this splendid car. You have the delightful consciousness of owning a car you can always be proud of.

Never Before Such Value

Three years ago a car like this was impossible at any price. Picture in your mind all that the "Thirty-Six" gives in looks, in comfort, in convenience, in power and speed. Such a combination of desirable things simply couldn't be bough: three years

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Covert Commercial Transmissions

FOR

1000 lbs	Wagons
1 Ton	Trucks
2 Ton	Trucks
3 Ton	Trucks
4 Ton	Trucks
5 Ton	Trucks
6 Ton	Trucks
7 Ton	Trucks

We are Transmission Specialists---Jackshafts for the above models are supplied by the leading manufacturers

Covert Motor Vehicle Company

Factory: Lockport, N. Y.

Sales Office: 1422 Ford Building, Detroit, Mich.

COVERT COVERT

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HOFFECKER SPEEDOMETERS

MANUFACTURERS-Equip your cars with this quality combination



The Hoffecker Speedometer

In the Realm of Speedometer Authority "THE STEADY HAND" HOFFECKER reigns supreme. It has stood rigid and exhaustive tests made by some of America's leading mechanical engineers, and has as a result been selected for speedometer equipment on some of the most prominent motor cars.

Its **superior workmanship** and scientific construction; its every refinement in mechanical detail, distinguishes it as the one PAR EXCELLENT speedometer in both **artistic appearance** and **satisfactory service.**

"Hoffecker is to a Speedometer

ABSOLUTE ACCURACY—obtained by a special **individual calibration process.**

A DAILY TRIP—giving intermediate distances which can be **easily** and **quickly** set to any desired mileage.

An instantaneous resetting TENTHS DEVICE, designating fractions of a mile—are some of the **individual** and **exclusive** HOFFECKER features.

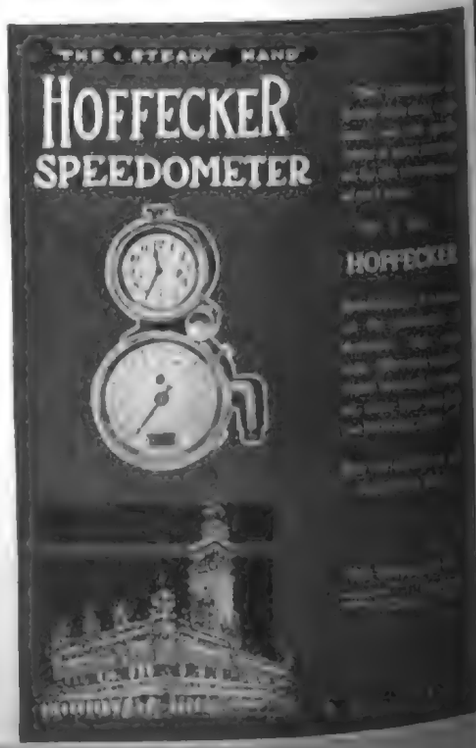
There are TWO models furnished either singly or in combination with the **famous** WALTHAM TIME-PIECE.

Discriminating users specify the HOFFECKER, the speedometer with **continuous service**—Seventh year of DEPENDABILITY.

SEND FOR CATALOGUE.

THE HOFFECKER COMPANY

Boston, Massachusetts



DEALERS — Insist upon this equipment on the cars you sell

WALTHAM TIMEPIECES

The Waltham 8 Day Timepiece



The past year has but given stronger emphasis to the superiority of Waltham 8 Day Time-Pieces—has proved conclusively that they are like Waltham Pocket Watches in a class unapproachable in reliability.

They have been used under all the varying conditions to which a car can put them and found to be absolutely dependable time-pieces.

They are built to Waltham Standard, which means they are the acknowledged leaders of the world.

what Waltham is to a Timepiece"



They are the only 8 Day Time-Pieces that have 15 jewels and adjusted to temperature; movement runs 8 days; has winding indicator.

Two of the models are cased to match Hoffecker Speedometers, thus insuring artistic uniformity of speed and time equipment, all with greatest efficiency.

For sale by leading jewelers and auto supply houses. Interesting, illustrated literature free.

THE WALTHAM WATCH COMPANY

Waltham, Massachusetts

THE NATIONAL AUTO SHOW



Under Auspices of National Association
of Automobile Manufacturers, Inc.

At
CHICAGO
Coliseum and 1st Regiment Armory

February 1 to 8

Passenger Vehicles
Parts and Accessories

February 10 to 15

Commercial Vehicles
Parts and Accessories

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Outlast Your Car

Easy Cranking

Porcelain at $1.00



The V-Ray Co.

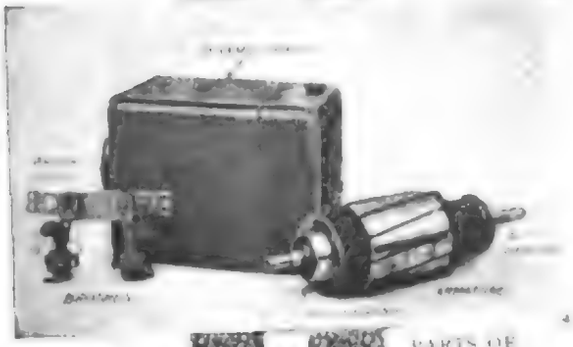
Marshalltown, Ia.

More Power

Less Gas

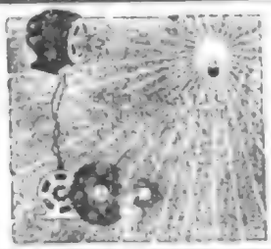
Mica-Lava at $1.25

The WARD LEONARD System for Lighting and Starting Every Trial a Triumph

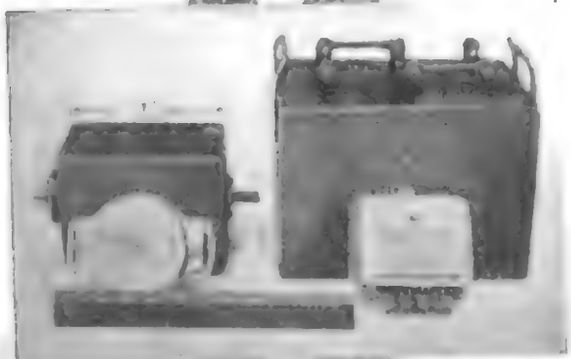


PARTS OF LIGHTING DYNAMO

WARD LEONARD



Lighting - Starting



COMPLETE EQUIPMENT FOR LIGHTING SYSTEM

Every trial of a Ward Leonard System means triumph for its designers and satisfaction for its users.

Every user—every dealer—every manufacturer realizes the need of an efficient lighting and starting system.

But each one of them wants the ultimate system, and the ultimate system will be that one which is theoretically, scientifically and practically correct.

There must be no complications, no unnecessary parts, nothing to get out of order.

The system that will answer these requirements is the Ward Leonard System.

Time and exhaustive experiments through twenty years of electrical experience have shown that the Ward Leonard System is perfect.

We realized years ago that the value of an electric lighting and starting system to the automobile manufacturer lay in the perfection of its automatic control. Our perfection of this feature stamps the Ward Leonard System as the ultimate choice of engineers.

Ward Leonard Electric Co.

BRONXVILLE, N. Y.

WARD LEONARD

INVADER OIL

ANNOUNCEMENT



Mr. T. E. Tomlinson has joined forces with Charles F. Kellom & Co., makers of INVADER OILS, the oldest and best known brand of automobile oils on the market, and in the future these will be manufactured and sold by a corporation known as THE INVADER OIL CO.

To Mr. Kellom's existing organization will be joined Mr. Tomlinson's old selling force so long associated with him and so well known to the trade.

Increased facilities for distribution have been provided to insure prompt deliveries.

Under the brand INVADER will be marketed the best oils in the world.

INVADER OIL COMPANY

Lessees of CHARLES F. KELLOM & COMPANY

Main Office: 80 Broad Street, New York City

PHILADELPHIA BRANCH:
113 Arch Street

NEW ENGLAND BRANCH:
284 Columbus Avenue, Boston, Mass.

DEALERS: An extensive advertising campaign has been planned for the coming season, which will largely increase the demand for INVADER OILS. Ask for our proposition.

A FULL STOCK IS CARRIED AT THE ABOVE BRANCHES FOR IMMEDIATE SHIPMENT

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JEFFERY-DEWITT CO.
DETROIT, MICH.

VISIBLE GAP SPARK PLUG TELLS ITS OWN STORY

Through the window in the porcelain of the plug—**outside** the motor—you can instantly tell if the plug is firing correctly. You can see the spark jump the gap in the central electrode at any time—the darkest night shows it up clearest.

It Simplifies the Trouble Hunt by Half

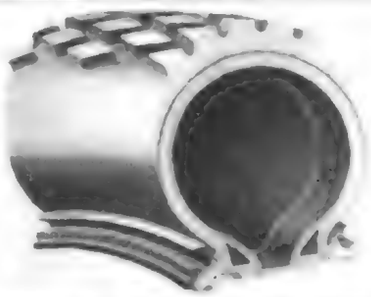
If there is a spark in the window, but proper ignition fails, you know the points are fouled. In that case, just turn the knurled micrometer nut at the top of the plug with the fingers and separate the visible points still more. This increases the intensity of the spark, breaks down all oil or carbon deposits between the points and automatically cleans them in

One Glance Through the Window Tells All

You need a set of these plugs in your motor. Send for a set now, enclosing price and size wanted (**or tell make of car**), and we will forward them at once, prepaid. Our rigid guarantee of positive satisfaction or your money back goes with every plug.

You Are the Judge in This Trial

only



No-Rim-Cut Tires
10% Oversize
By Far Outsell All Others

This Winter Tread
Will Indicate Why the Goodyear Won

Last year we sold 918,687 automobile tires.

Yet we failed to keep up with the flood-like demand by some 400,000 tires.

Seven years ago only one tire in ninety was a Goodyear tire.

Three years ago the demand was still one-twelfth as large as now.

Last year's sales by far exceeded our previous 12 years put together.

What has awakened men to Goodyear tires in this overwhelming way?

This winter tread will tell you. It shows how far we go, in every way, to multiply efficiency. To cut down tire expense.

This is only one item, but it reveals the entire Goodyear code.

Compare this tread with others, and you'll see why Goodyears won.

Note the Double Thickness

In this Non-Skid tire we add an extra tread almost as thick as the regular. Thus we give you a double-thick tread.

This extra tread is of very tough rubber, immensely enduring, almost impervious to wear.

Because of its thickness, the blocks are deep cut. Their non-skid efficiency lasts for thousands of miles.

A Bulldog Grip

These sharp-cut blocks present to the road surface countless edges and angles.

They grasp the road in every direction with a fairly irresistible grip.

But the greatest advantage lies in the fact that these blocks widen out, so they meet at the base.

They are not separate projections, which center the strain on a small part of the fabric. They distribute the strain exactly the same as with smooth-tread tires. That's the main reason why the Goodyear Non-Skid gives such exceptional mileage.

Compare this tread with others. Compare its thickness, the depth of its projections. Compare the apparent efficiency, due to these sharp-cut blocks.

Compare the way in which strains are distributed so the fabric can't be broken. One glance will show you that this Non-Skid surpasses anything else of its kind. About 250,000 of these treads have already been tested out.

Other Troubles Ended

Thus we have ended skidding troubles in the most effective way.

Years ago we ended rim-cutting, just as completely, just as efficiently.

Our patent tire—the No-Rim-Cut tire—has made rim-cutting simply impossible.

And that alone cut tire expense 25 per cent.

Our 10 per cent oversize, under average conditions, adds 25 per cent to the tire mileage.

Our 14 years of ceaseless tests and comparisons have brought our tire quality up to the maximum.

These things together, in the test of time, have placed the Goodyears on at least a quarter million cars.

One Must Respect This Verdict

Remember, please, that tire expense forms your major cost of upkeep.

A tire which cuts that cost in two is something quite important.

Men know when they get it in these days of odometers. They know which tire serves best. And the final verdict of these men who know favors Goodyear tires.

Men have tried and compared now pretty close to 2,000,000 Goodyear tires. As a result the sale of these tires has doubled every year. And last year's increase was 125 per cent.

Now these tires by far outsell all others. And this year's output, if this increase continues, will completely equip 500,000 cars.

One may easily question any maker's claims. But when hundreds of thousands of users unite, one must respect their verdict.

The verdict of experience favors Goodyear tires in an overwhelming way. And every month makes the verdict more convincing.

Is it not fair to suppose that your experience will bring a like result?

If you think so, get that experience. Make some comparisons. Settle this question by next time insisting on Goodyear No-Rim-Cut tires.

Write for the Goodyear Tire Book—14th-year edition. It tells all that we know, after fourteen years, about cutting down tire expense.

GOODYEAR
AKRON, OHIO

No-Rim-Cut Tires
With or Without Non-Skid Treads

THE GOODYEAR TIRE & RUBBER COMPANY, Akron, Ohio

Branches and Agencies in 103 Principal Cities.
More Service Stations Than Any Other Tire.

We Make All Kinds of Rubber Tires, Tire Accessories and Repair Outfits.
Main Canadian Office: Toronto, Ont. Canadian Factory: Bowmanville, Ont

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VISIBLE GAP SPARK PLUG
TELLS ITS OWN STORY

Through the window in the porcelain of the plug—**outside** the motor—you can instantly tell if the plug is firing correctly. You can see the spark jump the gap in the central electrode at any time—the darkest night shows it up clearest.

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If there is a spark in the window, but proper ignition fails, you know the points are fouled. In that case, just turn the knurled micrometer nut at the top of the plug with the fingers and separate the visible points still more. This increases the intensity of the spark, breaks down all oil or carbon deposits between the points and automatically cleans them in a jiffy.

And if there is no spark in the window, you know you must look to coil, batteries or magneto for your trouble.

You Don't Have to Take the J. D. Plug Out of the Motor

By this micrometer nut you can adjust each plug so as to give maximum sparking efficiency.

One Glance Through the Window Tells All

You need a set of these plugs in your motor. Send for a set now, enclosing price and size wanted **(or tell make of car)**, and we will forward them at once, prepaid. Our rigid guarantee of positive satisfaction or your money back goes with every plug.

You Are the Judge in This Trial

We make millions of spark plugs a year—that's our only business. We import the clays for our heat-defying porcelain, and use the best material on the market.

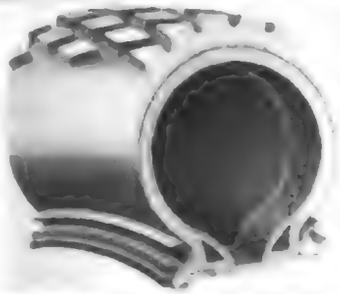
Yet the Price of the J. D. Visible Gap Spark Plug Is Only $1.00

Perhaps you would like our free book on Ignition. It contains a mine of useful information. A card brings it

JEFFERY-DEWITT CO.

565 Butler Avenue ***Largest Manufacturers of Spark Plugs in the World*** **DETROIT, MICHIGAN**

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No-Rim-Cut Tires
10% Oversize
By Far Outsell All Others

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GOODYEAR
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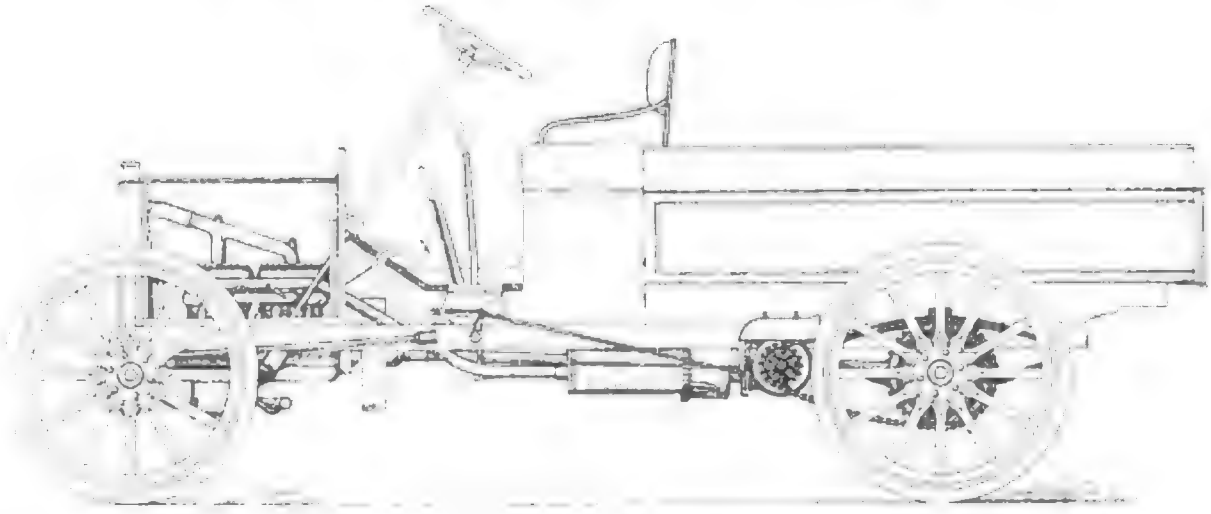
THE GOODYEAR TIRE & RUBBER COMPANY, Akron, Ohio

Branches and Agencies in 103 Principal Cities.
More Service Stations Than Any Other Tire.

We Make All Kinds of Rubber Tires, Tire Accessories and Repair Outfits.
Main Canadian Office: Toronto, Ont. Canadian Factory: Bowmanville, Ont. 9543

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The New Half-Ton MOTOR WAGON DETROIT



4 Cylinder, 4 Cycle Long Stroke Motor, 16-20 h.p.

CHAIN DRIVE—SOLID TIRES—EVERY PART STANDARD

The new Motor-Wagon merits your consideration because of its standard mechanical construction; its simplicity and economy of operation; its loading convenience; its neat, business-like appearance and its all-round proven value. It embodies the tried-out features that are the satisfactory result of two years' daily service in over thirty lines of business. Standard truck practice followed throughout.

Note these Details: Long Stroke Motor, Bosch Magneto with fixed spark, Muncie Transmission and Jackshaft, Whitney Chains, Dead Rear Axle (1½ inch squared), 3-inch Channel Frame, Solid Tires front and rear. This car is designed from start to finish for use with solid tires and gives a reliable economical service that cannot be duplicated.

The new Motor-Wagon meets the demand for a strong, serviceable, economical half-ton truck designed from a thorough knowledge of the services required.

Get in immediate touch with us. The new Detroit Motor-Wagon makes a hit with every merchant. It has the capacity and the economy of operation buyers want. Write at once for full details.

THE MOTOR WAGON COMPANY OF DETROIT
DETROIT, MICHIGAN

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SPRINGFIELD CONVERTIBLE BODIES

Dealers who anticipate the wants of hypercritical car buyers will be quick to see the advisability of specifying Springfield Convertible Bodies, for it stands that they make good cars still better and the quality argument they offer is too big to be discounted.

As specifications they offer a strong selling argument for both the manufacturer and dealer.

Beauty, convenience and sterling worth of these bodies is apparent to all who have seen them and studied their construction.

We show here an illustration which is a faithful picture of one of these products—made in a factory equipped to turn out bodies and tops of every style and size, from the smallest runabout to the most pretentious limousine or landaulet.

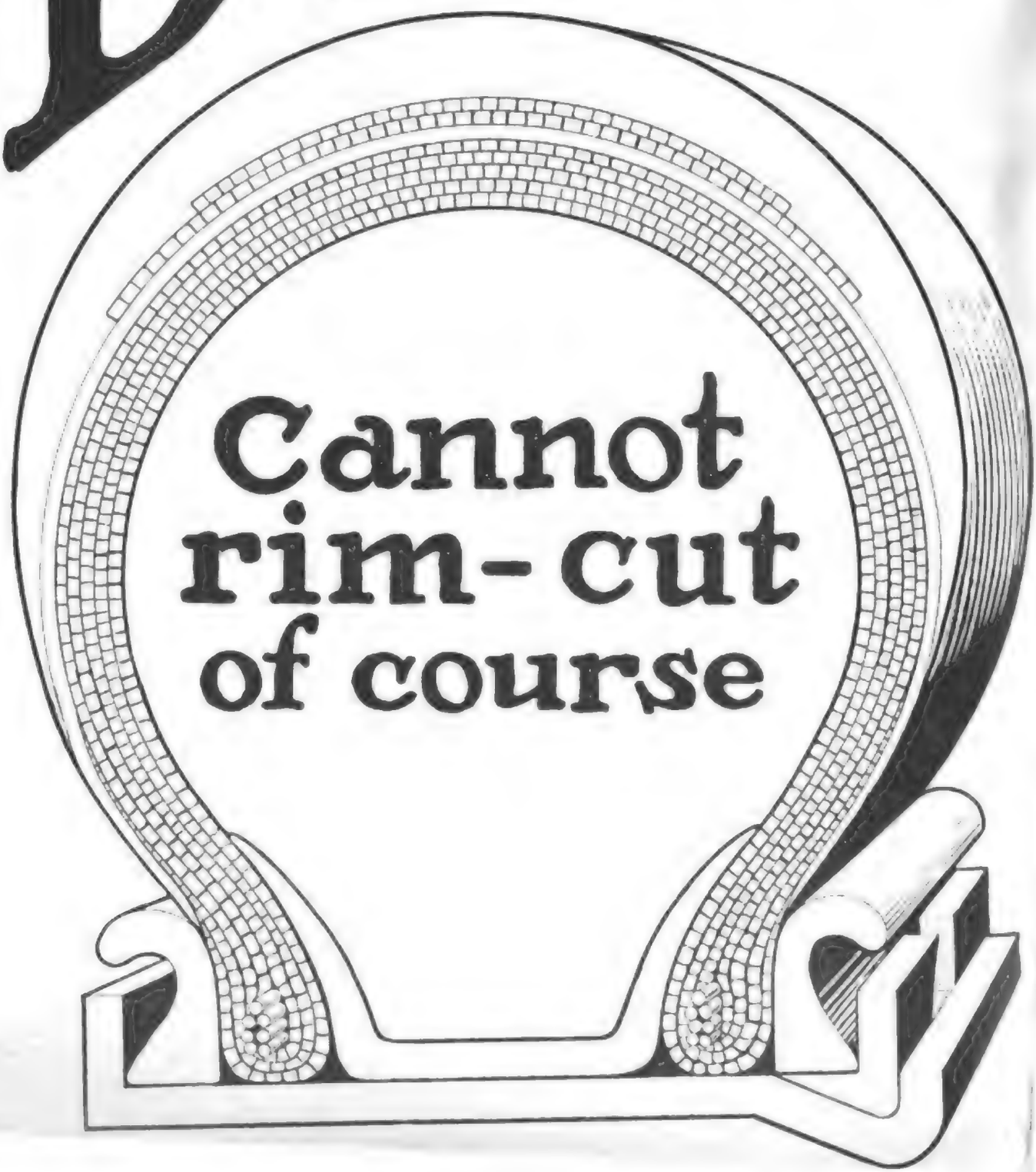
Send for complete details of construction.

SPRINGFIELD METAL BODY CO.

Springfield, Massachusetts



Dealers



Tie up to the GENUINE DUNLOP Straight-Side Tire

It is the premier automobile tire of the world

Our Dunlop Sales have increased 600% within the past year's time and the coming year is destined to show an even greater growth.

Motorists have come to realize what tire experts have long known, that the genuine Dunlop Straight Side is in many respects the ideal type of motor car tire.

The dealer who stocks Dunlop Tires now and pushes them vigorously among his trade will get the full benefit of this tremendous increase in business.

But bear this in mind—the Genuine Dunlop Tire—the tire that has shown this tremendous increase in popular demand—the only tire that possesses all the merits of this type, was originated and is now made exclusively by the

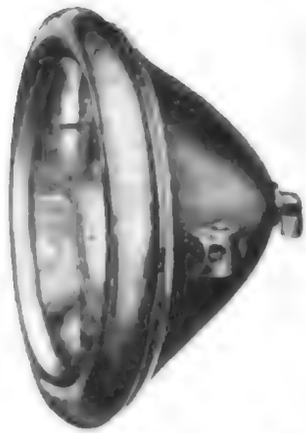
United States Tire Company New York

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Here's a Pair of Lamps

You Will Be Proud To Have On Your Car



Aplco Golden Glow Electric Headlights

contain more up-to-date features than any other automobile lamp made

1. They project light through fog and dust.
2. Locked against bulb thieves.
3. Focused without opening.
4. Absolutely water and dust-proof.
5. Glass reflector can be polished with a cloth without injury.
6. Highest grade optical glass mirror.
7. Exclusive design adds distinction to your car.
8. Beautiful finish.
9. Has neither hinge nor outside fastening.
10. Guaranteed to project a better light for a farther distance than any other lamp made.

Send for Booklet "A Drive Behind Bill's Lamps" Today

TO DEALERS

Here are just the lamps you need for your trade to replace the inferior lamps now furnished as regular equipment on new cars. Write for special proposition

Don't Miss Our Exhibits

During the Automobile Shows in Chicago and New York. We will show the Aplco Electric Engine Starters and Electric Lighting Systems at our stores, 20 Vesey St., New York; 1508 Michigan Avenue, Chicago.



THE APPLE ELECTRIC COMPANY

An Ohio Corporation. Capital $300,000 fully paid.

20 Vesey Street, New York
1508 Michigan Avenue, Chicago

Factory, 15 N. Canal Street
Dayton, Ohio, U. S. A.



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Prest-O-Starter

Starts your engine (old or new) quickly and easily in coldest weather

For Four Cylinders $20

For Six Cylinders $25

$1.50 extra for two-way valve necessary when the same Prest-O-Lite is used for both starting and lighting.

Here's a starter that adds practically no weight to your car, is perfectly simple and is as durable as the engine itself. Easily applied to any engine, old or new, very economical in the use of gas, and requires no expert repairing.

How Prest-O-Starter Works

The principle of starting a motor with Prest-O-Starter is the same as "starting on compression." A measure of acetylene, at low pressure, is pumped from your Prest-O-Lite into the cylinders.

Touch your spark—your engine starts

Unlike "gasoline priming," it is not affected by heat or cold. It is certain.

In cool weather, by opening a valve on the dash, you can feed gas at low pressure into the intake manifold. This allows your engine to run on acetylene until it is warm enough to run on gasoline.

If the Prest-O-Starter did no more than prime your engine in this way during cold weather, this convenience would be well worth the price.

But Prest-O-Starter is more than a primer. When installed properly, it will start your engine, summer or winter, almost invariably without recourse to the crank.

Make Sure Your Starter Is Installed CORRECTLY—Look It Over

The Prest-O-Starter is easy to install correctly. In fact, it's so very easy to install that some good factories and garages install it with utter carelessness, overlooking the one or two simple features vital to success in operation. Fortunately this is an easy matter for the car owner to correct, even if he isn't a mechanic.

Our literature tells you exactly how the Prest-O-Starter is installed, and how to adjust it. Anyone can give it the slight attention it may need or quickly tell a dealer where the trouble lies.

Every Prest-O-Starter is sold with the assurance of satisfactory service. The entire Prest-O-Lite Organization is back of every one. If you have any trouble, report it to us or to our nearest branch. We'll wipe it out quickly.

Insist Upon GETTING the Outfit COMPLETE

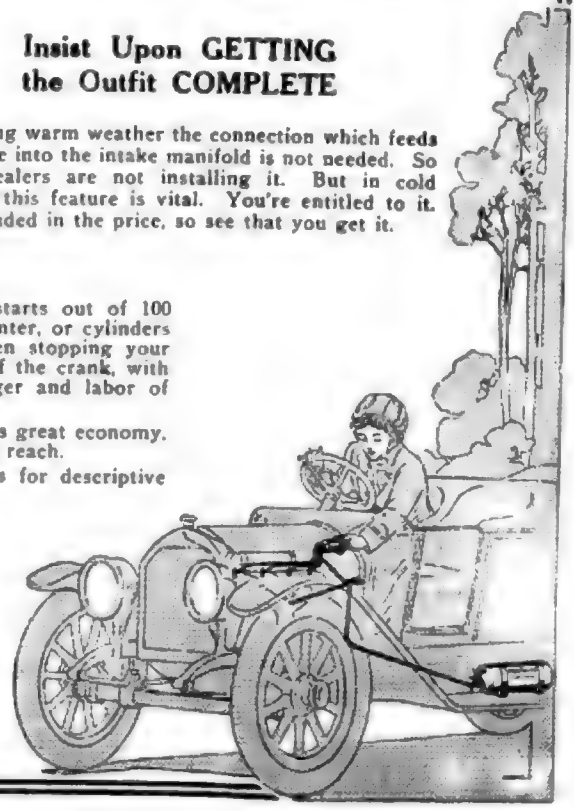
During warm weather the connection which feeds acetylene into the intake manifold is not needed. So some dealers are not installing it. But in cold weather this feature is vital. You're entitled to it. It's included in the price, so see that you get it.

Now—More Than Ever—You Need One

Your Prest-O-Starter, properly installed will average better than 95 starts out of 100 attempts. The few failures are caused by your motor stopping on dead center, or cylinders filled with burnt gas. Both of these conditions can be easily avoided when stopping your motor. But should either or both happen, an eighth or a quarter turn of the crank, with the switch at neutral, will remedy the trouble at once, with all the danger and labor of cranking eliminated.

Rest assured that no other starter can give you as high efficiency with as great economy, durability and freedom from mechanical trouble. The price is within easy reach.

Get in touch with any of our branches—or your dealer—or write us for descriptive literature



The Prest-O-Lite Co., 287 E. South St. Indianapolis, Ind

Canadian General Office and Factory, Merritton, Ont.

BRANCHES: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Memphis, Reno.; Milwaukee, Minneapolis, New Orleans, New York, Omaha, Philadelphia, Pittsburg, Portland, Ore.; Providence, St. Louis, St. Paul, Minn.; San Antonio, San Francisco, Seattle, Syracuse, Merritton, Ont.; Winnipeg, Manitoba.

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KLINE KAR Value

Four-Thirty, $1,750
Four-Forty, $1,985
Six-Fifty - $2,585
Six-Sixty - $3,500

Found In

Separate---

IGNITION

Two separate systems, including BOSCH MAGNETO

STARTING

Positive electric engine starter on three larger models and efficient automatic starter on "Thirty"

LIGHTING

Rushmore dynamo, with two 25 candle power head lights and, also, electric side, tail and dash lamps, which with the ***Economical Four Forward Speed Transmission*** afford

MAXIMUM SERVICE

(Series A-1 Literature Ready. Address Dept. W.)

Kline Motor Car Corporation

MAIN OFFICE AND FACTORY:
Richmond, Virginia

Richmond, Virginia — York, Pennsylvania

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Almost Lost in the Tide of Traffic!!

SHELDON TO THE RESCUE

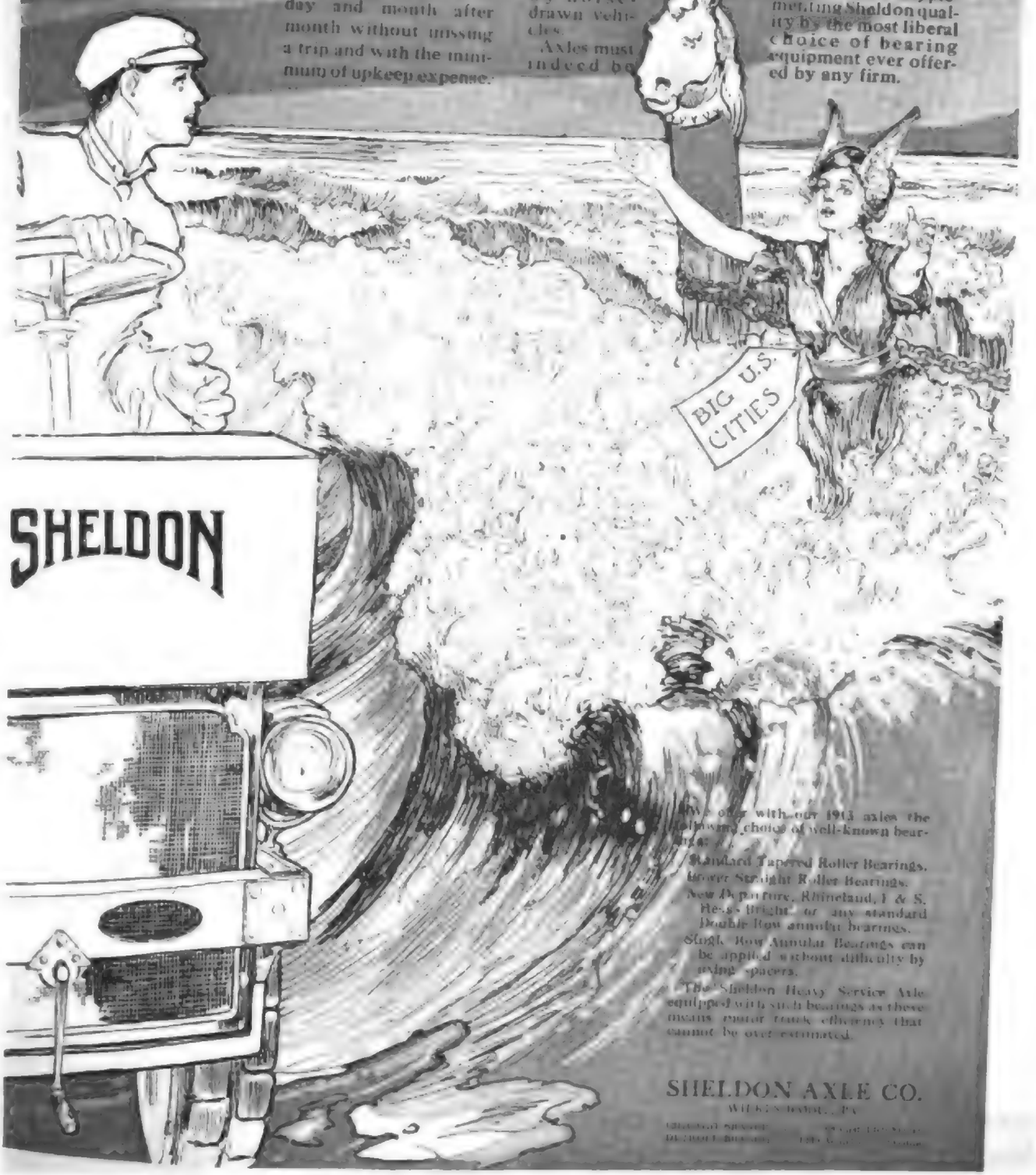
The substitution of motor trucks for horse delivery in our large cities has been made practicable by the flawless construction and the great serviceability of Sheldon Axles and Springs.

Wherever Sheldon Heavy Service Axles and Springs are used, you will find trucks making their deliveries day after day and month after month without missing a trip and with the minimum of upkeep expense.

It is this reliability and high efficiency of Sheldon equipped trucks that have relieved the larger cities of our country from much of the congestion and disasters attending heavy delivery by horse-drawn vehicles.

Axles must indeed be well made and perfectly equipped to accomplish such a revolutionary feat.

The public is well acquainted with Sheldon design and construction, and we are now supplementing Sheldon quality by the most liberal choice of bearing equipment ever offered by any firm.



...ve of our 1913 axles the following choice of well-Known bearings:

Standard Tapered Roller Bearings.
Brower Straight Roller Bearings.
New Departure, Rhineland, F & S, Hess-Bright or any standard Double Row annular bearings.

Single Row Annular Bearings can be applied without difficulty by using spacers.

The Sheldon Heavy Service Axle equipped with such bearings as these means motor truck efficiency that cannot be over-estimated.

SHELDON AXLE CO.
WILKES-BARRE, PA.

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Trade

GRANT
Gears of Quality
LEES

Mark

Annual Output Now
1,000,000 Gears

EVERY GEAR BOXED

Packed Like Annular Bearings



All Products Guaranteed

The Grant-Lees Machine Company
2360 Sixty-Ninth Street **Cleveland, Ohio**



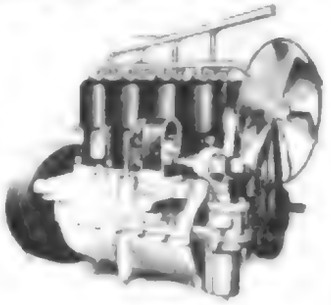
For The Hurry Call!

For the race with the stork, whether by day or by night, when there is something to be delivered P. D. Q., in town or country, though streets be crowded and roads be rough, the doctor must have a car that he can depend on. He can take no chances with a motor of spasmodic performance. He must *get there* and get there quickly.

There is no motor that gives such uniformly reliable service for the doctor's car as

THE RUTENBER MOTOR

It is built for precisely this kind of use. It is always ready, always in running order, always dependable. Rough roads and bad weather have no terrors for the doctor whose car is equipped with the redoubtable Rutenber. When speed is required it will run like a deer. It does not falter or hesitate. It does not jar out of adjustment. It does not heat up under hard driving nor require an expert to keep it in order.



Model R. A. Sta. Magneto side

More than a score of the best selling cars in America carry Rutenber Motors in their 1913 models.

The Rutenber Motor will give to *your* car the element of reliability that is fundamental to successful automobile construction; and will solve your motor troubles and assure to your product an unfailing market.

Write for the Rutenber Booklet.

CHICAGO SHOW SPACE
North Coliseum Gallery

RUTENBER MOTOR COMPANY Marion, Indiana

WHITNEY

The Most Practical Chain for Motor Trucks

Because the "Whitney" Cotter Detachable Chain can be easily separated at any link and lengthened, shortened, or repaired without the use of any special tool. This is of great advantage to truck builders, owners and drivers.

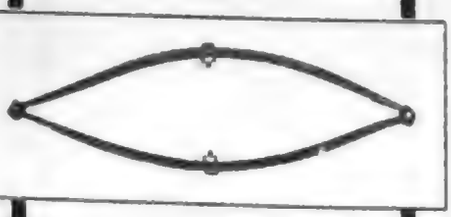
"Whitney" Chains are used by the leaders because they are strong, accurate, dependable and above all long lived. They are made right and they're made from the right kind of material, thus giving highest efficiency. When making replacements insist on a "Whitney."

"Whitney" Chains Are Built for Strains

THE WHITNEY MFG. CO., Hartford, Conn.

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Penn Springs

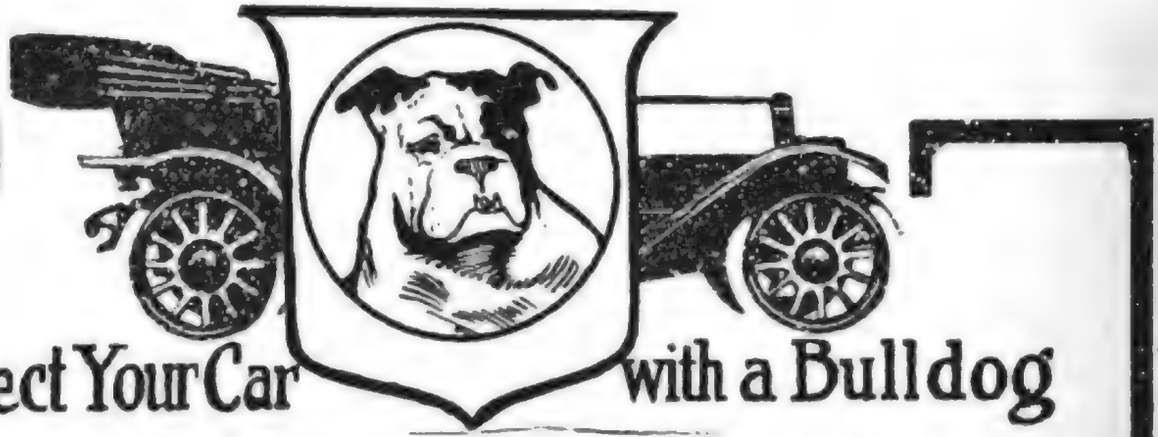


Penn Spring Works

BALDWINSVILLE
NEW YORK

PENN SPRINGS are tested for resiliency and tensile strength far beyond any point that could be reached in every day service. They are guaranteed against fatigue and through the special grades of steel and methods of construction they will give service "plus."

Car manufacturers can make our engineering force part of their organization in the work of producing springs that are true in even load carrying, resilient and engineered to fit the particular car for which they are designed.



Protect Your Car with a Bulldog



BULL DOG AUTO LOCK

Progressive Dealers

will be alive to the sales possibilities of this device, which is by long odds the best insurance against theft, joy riding and meddlers generally

The Bull Dog Auto Lock is one of the necessities that is "a little worker with a big mission to perform," and to see it is to want it. Dealers have proved this by the number of sales they have made and are making.

This safety device is simple in construction, easy to attach and detach, neat in appearance, and has the tenacity of a bull dog. It will fit all modern cars that have a sliding gear transmission.

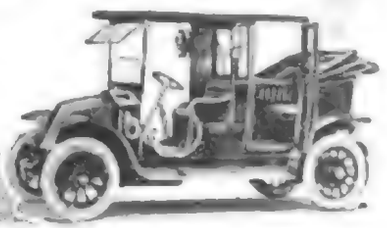
Write and get our proposition to you. The retail price is $2.50, small enough to make sales come easy and large enough to give you a liberal commission.

CONSOLIDATED MACHINE WORKS
6036 Wentworth Avenue Chicago, Ill.

Croxton

Croxton cars incorporate all of the features for which the buyer looks in the new models. Write for catalog and agency details.

The Croxton Motor Car Co.
Washington, Pa.



BOYCE
MOTOMETER
PAT'S PEND'G

1913's TRADE SENSATION

Know the Exact Heat of Your Motor While Driving



(Front view ½ actual size.)

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Attached the same an an ornament, readily visible from the seat day or night. It will prevent frozen radiators in winter and cracked cylinders in summer.

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Broadway and 58th Street, New York
Exhibiting—Madison Square Garden Show, Space 540, Basement



Price $10
View from Seat

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Steering Gears



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The prime features of Warner Gears are: accessibility; complete interchangeability; use of eccentric sleeves; adjustable angle of column; large bearing and contact surfaces specially hardened and ground, assuring ease of motion and durability.

The Warner line includes a wide range in both pleasure and commercial types.

We guarantee dependable deliveries.

Get acquainted with Warner Quality—make it another selling argument.

We modify our designs to meet your detail requirements, or build on approved designs on seasons quantity specifications.

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AUTO-METER

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Prices from $50 to $145. For sale by dealers all over the world and at our own branches.

Handsome catalogue on request.

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Atlanta, Buffalo, Cincinnati, Denver, Indianapolis, Los Angeles, Philadelphia, Portland (Ore.), Seattle, Boston, Chicago, Cleveland, Detroit, Kansas City, New York, Pittsburgh, San Francisco [illegible]ouis. Canadian Branch: 559 Yonge St., Toronto, Ont.

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Universal Tire Pressure Gauge



For Sale by Tire Manufacturers, Jobbers, Dealers, Garages or

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Chosen by America's Leading Manufacturers

More Remy Magnetos are being used on 1913 American Automobiles than all other makes combined.

Our contracted sales for 1913 are Five Times Greater than in 1912.

We ship over 13,000 Remys monthly.

This is an expression of the confidence of this country's foremost manufacturers in Remy Magnetos and the facilities of the Remy plant in Anderson, Indiana.

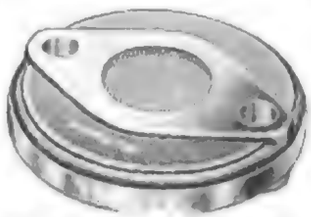
See that a new Remy is on the car you buy.

Exchange your old magneto (any make) for a new 1913 Remy: it will cost you practically no more than repairs on your present ignition system.

The Remy Electric Company, Anderson, Indiana

Chicago Show—Space 66, Coliseum Balcony

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A FUEL SAVER and A MONEY SAVER

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560 Phelan Bldg., San Francisco, Cal., Western Representatives.

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MOTORCYCLES
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Since the introduction of BENZ cars to the motoring public of America no car has attained such world-wide supremacy as to its construction, standing up quality, and material The new type of 35 and 50 H. P. BENZ models are the last word in automobile construction.

The noticeable features of this type of BENZ cars include the offset crank shaft, smokeless oiler, and SILENT CHAINS instead of timing gears.

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To those desiring AGENCY of this car the Benz Company will offer special terms. We want RELIABLE, ENERGETIC agents to further our interests for both BENZ pleasure cars and BENZ-GAGGENAU trucks, which today stand recognized by those who know, as the leading 6-ton truck. Wire or write us, no matter where you are.

Our PRICES compete with LEADING AMERICAN makes.

BENZ AUTO IMPORT COMPANY OF AMERICA

250 West 54th Street **New York, N. Y.**

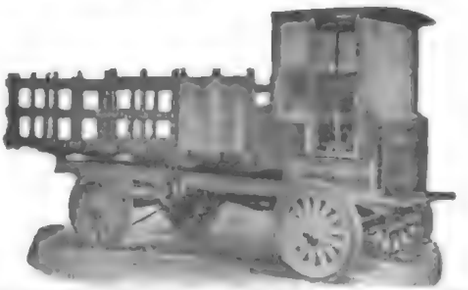
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Lauth-Juergens Trucks are Delivery Insurance

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ONE, TWO AND THREE TON CAPACITY



LAUTH-JUERGENS TRUCKS ARE THE LATEST IN CONSTRUCtion, most powerful in operation and the motors are guaranteed against defective workmanship and material for the life of the truck. They are positively the highest class trucks made. Two cylinder, cast-en four cylinder, one, two and three-ton. Four speeds forward. Ideal bright ball bearing transmission made in our own shops of the finest tool steel, three plate disc clutch, covered by patents owned by us. Send for 1912 Catalog and specifications. Prompt delivery on all models. Large publicity campaign just begun. Our quality will do the rest.

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SPLITDORF MAGNETOS can always be depended upon to give your motor more power. They give the same efficient service winter and summer and never falter under any test.

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Prevent skidding, make quick starts and short stops easy.

Give double mileage because of the full-thickness tread under the studs.

Most Widely Imitated of All

We guarantee the Republic Black-Line Red Inner Tube to be as nearly perfect as a tube can be made—and is a fitting companion for the splendid Republic Staggard Tread.

The Best Tube Made



Republic Staggard Tread

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The Truck Built by Truck Specialists



A high grade, dependable one-ton truck, accessible, simplified, and built to give service that is bound to satisfy the user.

Four-cylinder, water-cooled unit power plant, 3-point suspension. Clutch and flywheel in oil-tight housing. Lastingly good, therefore permanently popular.

This is a truck for which live dealers will find ready sale. Write for the terms.

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Guaranteed Materials
Guaranteed Accuracy of Dimension
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No ball bearing is so carefully made, closely gauged, persistently inspected and insistently standardized.

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Costs Little to Buy—Costs Nothing to Operate

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THE G. PIEL COMPANY 13th Street and Boulevard LONG ISLAND CITY

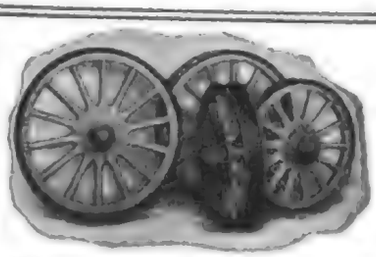
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Cut Gears of Quality
Complete Differentials

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Ready for 1913

"STANDARD" WHEELS

FOR PLEASURE OR COMMERCIAL CARS
One Passenger to 16 Tons Capacity

Send for Catalog No. 15

STANDARD WHEEL COMPANY, Terre Haute, Ind.



Tire Resistance to Decay

can be increased at least 30 per cent. by the use of Tirenew and Narco Cut Filler



TIRENEW is a liquid, unvulcanized, rubber compound — waterproofs and protects the inner fabric from decay.

Makes Tires Look Like New

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TIRE CUT FILLER

a self-vulcanizing, combination rubber cement, cut filler and mastic. Fills cuts and puncture holes—heals over night—becomes like part of the tire. $1.00 a tube. Dealers—Car Owners—Send $1.00 for a trial can of Tirenew—contains enough for 10 tires.

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INTERLOCK INNER TIRES
Stop Tire Troubles

The one weak point of the automobile is that you cannot depend on the tires. Thousands of motorists have solved their tire problem by discarding inner shoes, reliners, fillers and other makeshifts and equipping their tires with **Interlock Inner Tires.**

Interlocks are complete inner tires (not inner shoes) placed between the outer casing and inner tube to strengthen the casing and protect the tube from punctures. They double the mileage of new tires and add 1,000 to 5,000 miles to old ones—save half your tire expense—and make tires trouble proof.

Dealers and Motorists—Investigate Interlocks

Don't delay—write now for booklets, data, prices, testimonials of users, road tests, etc. Mention size and kind of tires you use.

DOUBLE FABRIC TIRE CO. 600 W. 9th Street, Auburn, Indiana

70% More Tire Mileage

WIRE McCUE WHEELS

Save Tires—Save Fuel—Save Car. Make cars easier riding and easier driving. Stronger than any other practical wheel.

THE McCUE CO., Buffalo, N. Y.

Another Victory for Staver

Staver 55 was the only touring car to finish the exacting "Round Lake Michigan" reliability run with a perfect score—repeating its victory in the contest of the preceding year.

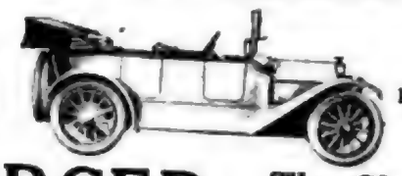
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For 1913, we are concentrating on three great models—Staver 55, Staver 45 (our competition crushing forty), and our big Staver Six.

Staver cars are roomy, luxuriously upholstered, up to the minute in equipment. Backed by Staver durability, they are the biggest value on the market.

STAVER CARRIAGE CO., 76th and Wallace Sts., Chicago

Type 35 Series G and H



Electric Lighting and Starting

MERCER *The Champion Light Car*

Mercer power and efficiency are well-known qualities. These features are decidedly emphasized in our new series. The various models offer a Mercer for every reasonable need.

PRICES: $2600 to $2900.

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MERCER AUTOMOBILE CO. 700 Whitehead Road Trenton, N. J.

Mighty Michigan "40"

40-Horsepower Touring Car or Roadster, absolutely silent in operation. Oversize tires 35 x 4½—cylinders 4¼ x 5¼ in.—118-in. wheelbase—four-forward-speed transmission—demountable rims—nickel mountings—massive, straight-line body—big, roomy seats—electric lighting by generator—everything. Price $1585, includes full equipment. Two smaller models. Catalog on request.



MICHIGAN MOTOR CAR COMPANY

[120] Kalamazoo, Mich.

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"The Easiest Riding Car In The World"

The Marmon "32"

Four cylinders, 32-40 h.p., 120-inch wheelbase, electric starting and lighting system, left-hand drive, center control, nickel trimmings, with newest body types to meet every requirement and corresponding equipment—

$2,850 to $4,100

The Marmon "48"

Six cylinders, 48-80 h.p., 145-inch wheelbase, electric starting and lighting system, left-hand drive, center control, nickel trimmings, with body types to meet every requirement and corresponding equipment—

$5,000 to $6,350

Detailed Information on Request.

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INDIANAPOLIS (Est. 1851) INDIANA

Sixty Years of Successful Manufacturing

Kupmobile

Kupmobile "32" Touring Car, Fully Equipped, $975 F.O.B. Detroit

Long-stroke motor, 3¼ x 5½ inches. Enclosed valves. Three bearing crank shaft. Unit power plant. Multiple Disc clutch. Three speeds forward. Sliding gears. Full floating axle. Center control. Zenith carburetor. Bosch magneto. 106-inch wheelbase. 32 x 3½ inch tires. Quick detachable rims. Mohair top with envelope. Jiffy curtains. Windshield. Rear shock absorber. Prest-O-Lite tank. Gas headlights. Oil side and tail lamps. Tools—horn. Trimmings, black and enamel. Standard color, black. Magneto and camshaft driven by silent Coventry chain.

Kupmobile "32" Roadster, Fully Equipped, $975 F.O.B. Detroit

Chassis and specifications same as Touring Car. Large turtle back dust proof compartment for extra accessories, tires and baggage.

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Chassis same as Touring Car. Enclosed panel body. Two cushioned lazy-back seats. Carrying capacity, 800 lbs. Chassis and body painted black, high-class finish. Two-piece windshield. Prest-O-Lite tank. Gas headlights. Oil side and tail lamps. Quick detachable rims. Tools—horn. Trimmings, black and nickel.

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IDEAL MOTOR CAR COMPANY

Manufacturers of STUTZ CARS INDIANAPOLIS, IND.

cartercar



Climbs a 50% grade—Friction Transmission—and number of speeds. Five models—write.

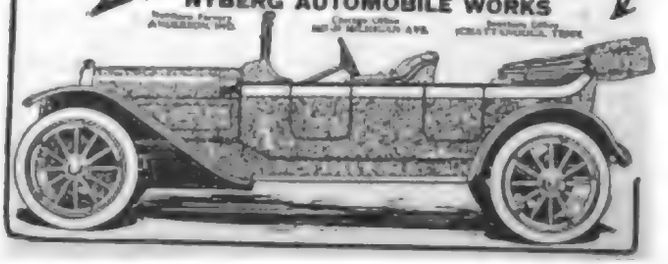
CARTERCAR COMPANY, Pontiac, Michigan

Nyberg SIX $1750

ANNOUNCING 1913 TOURABOUT

Complete Specifications Sent on Request

NYBERG AUTOMOBILE WORKS



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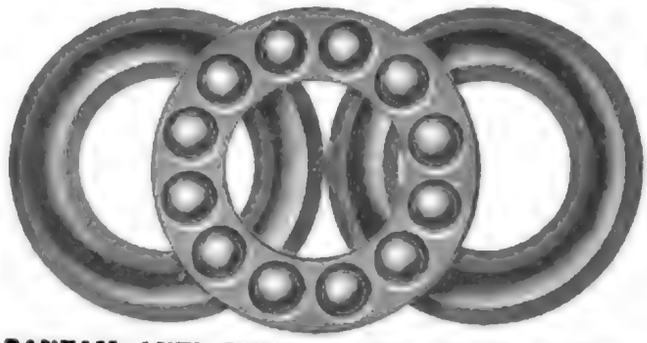
The Kinsey Manufacturing Company

TOLEDO, OHIO

Manufacturers of Auto Parts,
Kinwood Radiators, Fenders,
Kinwood Oilers, Gaskets,
Kinwood Steel Frames, Etc.

SPECIAL METAL STAMPINGS

WE MAKE THE BEST



BANTAM ANTI-FRICTION CO., Bantam, Conn.

EISEMANN

Has Always Led

Ask us to tell you about the wonderful new pole pieces and the Automatic Control Magneto.

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Rudge Whitworth Detachable Wire Wheels

fitted with

Houk (Quick Detachable) Rims

Guaranteed the Best in the World

Geo. W. Houk Company
5003 Lancaster Ave., Philadelphia, Pa.



Patent "Luxury" Folding Seats

Do you wish to make your car more comfortable by installing a pair of auxiliary seats? If so, have the best. Our seats are made in five styles. Send for catalogue.

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Amesbury, Mass.

ANNULAR BALL BEARINGS
The Dependable-Kind
F&S
J.S. BRETZ COMPANY
Sole Importers
MOTOR HALL, 250 West 54th St., NEW YORK

What Are the Three Valve Troubles?

There are three valve troubles encountered by every automobile engineer.

A valve which overcomes these troubles will be shown in the January 30 issue of the Motor World.

Watch for our advertisement.

The Electric Welding Products Co.
CLEVELAND, OHIO

The Reasons for Jencick Quality and Jencick Prices are worth knowing.

JENCICK MOTORS For Motor Trucks

from base to spark plug, have features that are "Different and Better."

JENCICK MOTOR CORPORATION
Port Chester, New York

Mr. Dealer: The Borland is *the* Electric to satisfy the owner and profit the agent. Secure your territory *now* for 1913.

Our complete line of models will be demonstrated at the Chicago Show—Space A-1, First Regiment Armory

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Salesrooms; 2638 Michigan Ave., Chicago

Factory: E. Huron Street

The Chicago Electric

A beautiful and classic equipage that stands unchallenged in point of constructional achievement.

CHICAGO ELECTRIC MOTOR CAR CO.

3606 South Morgan Street, Chicago

Ford
THE UNIVERSAL CAR

We have had to double our gigantic output —and the demand is more than doubling. Nearly 180,000 have been sold and delivered. New prices $525 to $800. Dealers everywhere. Ford Motor Company, Detroit, Michigan.



Dorris
Built to last

THE SILENT CAR

BUILT TO LAST

Our agency proposition will interest you. Write for it.

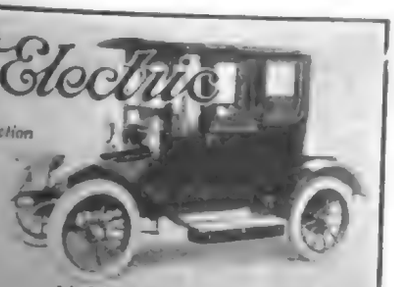
DORRIS MOTOR CAR CO.

Sarah and Laclede Aves. St. Louis, Mo.



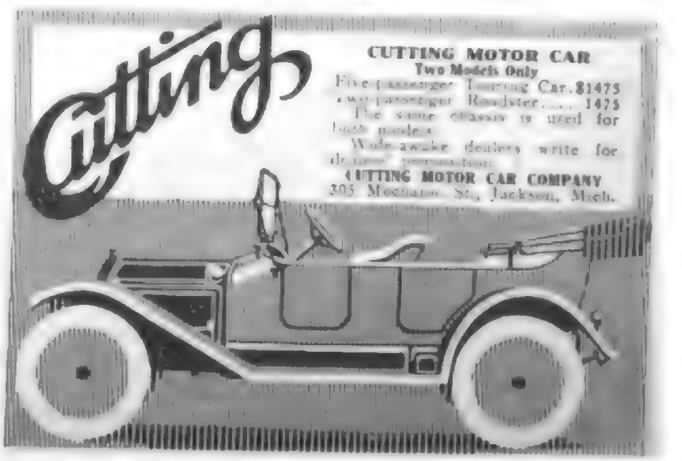
Buffalo Electric

Direct Drive—Single Reduction
Foot Control
Irreversible Worm Steer
Long Mileage Batteries
Buffalo Service



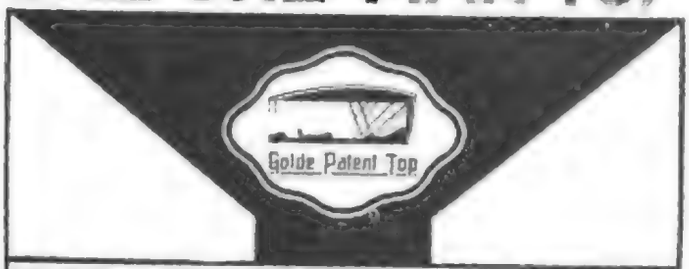
Model 29 Roadster. . . $2,600
Model 30 Coupe. . . . 3,200
Model 30-B Coupé. . . 3,300

The Buffalo Electric Vehicle Company
Buffalo, New York



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THE ONE MAN TOP



CAN BE HANDLED BY ONE PERSON AS EASILY & QUICKLY AS AN UMBRELLA
INSTANTANEOUS PROTECTION
GOLDE-PATENT MANUFACTURING CO. 515 W. 56th ST. NEW YORK.



RIGHT NOW

is the time to put a

JONES SPEEDOMETER

Model 40

on your car if you want accuracy and quality!

THE JONES SPEEDOMETER Bush Terminal, Brooklyn, New York Broadway and 76th St., New York City

YOUR BRAKES GRIP

When Lined With



TRADE MARK Raybestos REG. U.S. PAT. OFF.

"THE ORIGINAL AND BEST ASBESTOS BRAKE LINING"

THE ROYAL EQUIPMENT COMPANY
436 Housatonic Ave. Bridgeport, Conn.
We also make Duplex and Raymond Brakes and Gyrex, the Mixer.

The Motor Lamps with Distinctive Features

There are no other motor lamps on the market with the advantages of Solar Lamps. Solars are always exclusive in style and in quality. They are the strongest lamps as well as the most effective.

In no other lamps can you obtain the Solar Special Short Focus Lead Glass Lens Mirror Reflector—the patented system of double ray light projection which gives two distinct fields of light for town and country use—or the new and exclusive black finish with a metallic lustre which is unaffected by heat or moisture. All of these features are exclusively "Solar."

Do not equip your car or specify equipment to the maker until you have seen all of the Solar advantages. See Solars at any live dealer's or write for the catalog.

Solars are made in all styles for oil, electricity, gas and in combinations.

Solar Lamps

BADGER BRASS MANUFACTURING COMPANY
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Drop Hammer Forgings

cost very little more than castings. They are vastly superior and less expensive in the end.

WE ARE SPECIALISTS

in producing

DROP HAMMER FORGINGS

from special analysis steel.

Send prints of parts you will need in

1913.

QUALITY AND SERVICE GUARANTEED

THE CONSOLIDATED MANUFACTURING COMPANY, Toledo, Ohio



Reboring Casing



TIRE CUTS ruin casings. They admit moisture to the carcass, cause the fabric to rot and weaken, grow larger—end in blowouts.

You can repair **CASINGS** and **INNER TUBES** anywhere in 15 minutes, better than a Repair Shop can do—and for *one cent*.

Universal Auto-Vulcanizer

Patented

A practical vulcanizing outfit complete, with enough repair gum to make 40 patches. It weighs 3 pounds and can be carried in the tool box. **Simplest and most satisfactory device for eliminating tire troubles that has ever been devised.**

Absolutely automatic. Place the patch—attach the Vulcanizer—put in the gasoline—light it. No further attention required. In 15 minutes the job is done.

It *can't burn, scorch* or *injure* tube or casing. It *can't* get out of order. It *can't* fail to do its work. So simple, anyone can operate it. The Universal Auto-Vulcanizer saves its cost a *hundred times* over in trouble and expense.

Price Complete **$4.00** Ready for Instant Use
Guaranteed Satisfactory or Money Refunded

ADAMSON MFG. COMPANY, East Palestine, Ohio



THE OTTO KONIGSLOW MFG. COMPANY

CLEVELAND



Lamp Bracket

Pressed from cold rolled steel, light and very rigid. Send for attractive quotations.

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1912

Occupying the newest and most modern automobile manufacturing plant in America.

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The Kentucky Thoroughbred "AMES 45"

Long stroke, powerful Continental Motor—Electric (Dynamo) Lights—Self Starter—Left Hand Drive—Full Equipment—"Amesbuilt" Bodies and Tops. A combination of power, speed, endurance and graceful lines. Price, fully equipped, $1,635. This is 1913's most remarkable car value. Backed by a reputation of 30 years it will win you from the first inspection. We have a most liberal proposition for good, live agents. Send for catalog.

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THE ULTIMATE CAR
(KNIGHT TYPE MOTOR)

The first American Car to adopt the Silent Knight Motor—the engine used by Daimler, Mercedes, Panhard and Minerva.

THE F. B. STEARNS CO.
CLEVELAND, OHIO
Branches and Dealers in 125 Cities

HAVERS "Six-44" $1850

Touring Car and Roadster Types. 44 h.p. 6 Cylinders. Unit Power Plant. 3-Point Suspension. 122 in. Wheel-Base. 36 x 4 Tires.

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HAVERS "Six-55" $2250

Touring Car and Speedster Types. Electric Starter. Electric Lights. 55 h.p. 128 in. Wheel-Base. 36 x 4 Tires. Fully Equipped.

Write for full specifications

HAVERS MOTOR CAR COMPANY, Port Huron, Mich.

Write For This Franklin Dealer Proposition



FRANKLIN six-cylinder models now equipped with Entz Electric Starting and Lighting. A real self starter with original features. Franklin cars use less gasoline, less oil, no smoke, fewer tires, travels faster, rides easier, silent, powerful, flexible, beautiful. Get the Proposition.

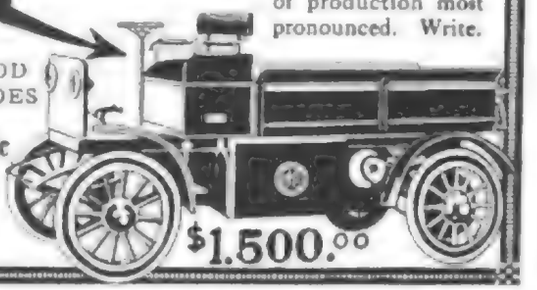
FRANKLIN AUTOMOBILE CO.
28 Franklin Square, Syracuse, N. Y.

M & P ELECTRIC VEHICLES DETROIT

DEALERS—Here is the first electric truck that sells for about $700 less than any other. Capacity 1000 pounds—Service 100 per cent. more than gasoline truck—Economy of production most pronounced. Write.

MADE TO MAKE GOOD AND IT DOES

M & P Electric Vehicle Co.
Trumbull and Dubois Sts.
DETROIT, MICH.



$1.500.00

Hook up with COLE

COLE

Series Eight comes in Three Chassis:

Cole Sixty six-cylinder Touring Car, five passenger convertible to seven passenger, 130-inch wheel base, Delco electric lighting, starting and ignition. $2485

Cole Fifty four-cylinder Touring Car, five passenger convertible to seven, 125-inch wheel base, Delco system. $1985

Cole Forty four cylinder Touring Car, five passenger, 116-inch wheel base, Delco system. $1685

WRITE TODAY for Cole Blue Book and dealer's proposition.

COLE MOTOR CAR CO., Indianapolis, Ind.

Hook up with COLE

PULLMAN 1913

Three New Models—All Fully Equipped

4-36	4-44	6-66
$1,575	$2,150	$2,750

We are building 500 extra PULLMANS for 1913—1500 in all. Our present dealers have spoken for 1000 and the increase is for new territory—possibly yours is open. Our SALES MAKING ORGANIZATION helps the agent—let us tell you how.

PULLMAN MOTOR CAR CO., York, Pa.

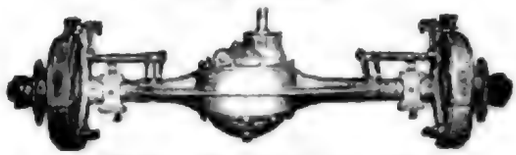
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ZENITH CARBURETOR CO., Detroit, Mich.

AXLES



Write today for our booklet

THE AMERICAN BALL-BEARING COMPANY
Cleveland, Ohio

THE GRINNELL
Gas Controller and Igniter

Price Complete $24

Lights, dims and extinguishes all gas lamps on the car through a simple turn of the hand. Coupled to valve-stem of acetylene tank. Direct control. Always within easy reach

Convenient
Safe
Dependable



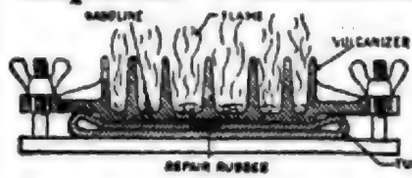
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THE G. C. A. MANUFACTURING CO., Pittsfield, Mas
Sole Licensed Manufacturers for the United States.

Inner Tubes Easily Repaired in 15 Minutes

Do it yourself anywhere, and save time and money, with the

Imperial Vulcanizer Repair Kit



PRICE $2.50
NICKEL PLATED
Patent Pending

Complete with enough rubber for 40 punctures. At your dealer's or sent by express.

Place tube between plates of vulcanizer (see cut); tighten thumb-screws; put a little gasoline in pronged receptacle; ignite. Operation simple. Repair permanent.

Guaranteed to Satisfy or Money Refunded

McGRAW TIRE & RUBBER CO., Dept. E, East Palestine, O.

Any Kind Every Kind Stock, or to Blue Print

Rims

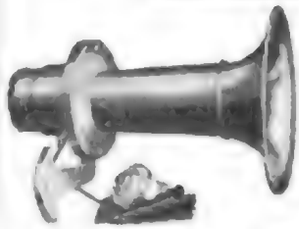
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NEWTONE
"The Horn That Warns"

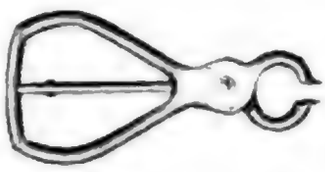


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Not only the cheapest but the best

Send for catalogue anyway
It will interest you

Automobile Supply Manufacturing Co.
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GILMER TIRE REPAIR PLIERS

The biggest live wire selling proposition that ever went across the dealer's counter. Get the details and you will surely order.

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GILMER TIRE REPAIR PLIERS

Mr. Dealer: Look over our "For Sale, Want and Exchange" columns. You will surely find some where among those annoucements a buying opportunity—a straight line to something you want now. Remember that 8,000 other readers are doing the same thing—5,000 of them dealers. All of them intensely interested in the automobile industry. This means a live selling opportunity that costs mighty little.

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Completely equipped, fully guaranteed. 22½ H.P., 4-cylinder water-cooled motor, Bosch magneto. Artillery wheels, best quality 30" x 3" clincher tires. Makes 5 to 50 miles per hour on the high speed, 28 to 32 miles on 1 gal. of gasoline. You can secure EXCLUSIVE SALE in your territory. Send for Book "B."

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GOODYEAR

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This name on Automobile Tires and Rubber Accessories signifies inherent qualities of material and workmanship that insure the maximum of service at the minimum of expense. (673)

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OF EVERY DESCRIPTION

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"The Speedometer of Quality"

Special features that eliminate speedometer troubles. Send for the booklet.

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SIMMS MAGNETO "American Made"

NOW READY FOR THE TRADE

Highest Efficiency—Good Service Guaranteed

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MOTZ Cushion Tires

For Pleasure Cars and Light Delivery Cars

Send for Booklet 58

The Motz Tire and Rubber Co.
Executive Offices
AKRON, OHIO

Service Stations in All Principal Cities

Schafer Ball Bearings

Famous for Their Durability

BARTHEL, DALY & MILLER
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Look at our new middle name

PENNSYLVANIA Oilproof VACUUM CUP TIRES

PENNSYLVANIA RUBBER COMPANY
Branches: Coast to Coast. Jeannette, Pa.

The Ford Water Circulator

forces the water from radiator through cylinder water jacket, maintaining rapid circulation when car is in motion. Write for descriptive matter if you handle Ford cars.

THE FULTON-McCUTCHAN CO.
1146 Michigan Ave. CHICAGO, ILL.

The Bush Radiator

THE BUSH MANUFACTURING CO.
HARTFORD, CONN.

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Final and crowning achievement of R. E. Olds, pioneer designer of Autos. A standard size 30 to 35 horsepower four-cylinder car of modern refinements, priced at only $1,095.

R. M. OWEN & CO., General Sales Agents
REO MOTOR CAR CO., Lansing, Mich.



Special Milled Parts

Cap and Set Screws
Plain and Castellated Nuts

The National-Acme Mfg. Co.
CLEVELAND, Sixth City

New York Boston Detroit Chicago Atlanta Montreal

POLSON Quality Windshields

Auxiliary Seats, Bumpers and Gas Starters

POLSON MANUFACTURING CO., Buffalo, N. Y.

NATIONAL Compound Mixer and Primer

makes any car start easier in cold weather; adds 10 to 40% to power and mileage. Simple, easily installed, guaranteed effective on any motor. Get details and price.

NATIONAL MANUFACTURING CO., Kalamazoo, Mich.

ARGO ELECTRICS

METZGER-HERRINGTON ARGO CO.
Distributors

2412 Michigan Avenue, Chicago, Ill.
Factories, Saginaw, Mich.

CHAMPION SPARK PLUGS

Special Designs for Every Type of Motor Made

CATALOG MAILED ON REQUEST

CHAMPION SPARK PLUG COMPANY
TOLEDO, OHIO

DEALERS — READ THIS

We have a plan to help you sell more cars. Our business is financing the sales of automobiles to people you would trust if you could do a credit business. We make good your credit and pay your car sales commissions at once. Get the details.

Harman-Yount Co. *Kenton Harman, President*

1788 Broadway, NEW YORK
301 Abbott Building, Cor. Broad and Race Sts.
PHILADELPHIA, PA.

American Kushion Kore

A tire filler 10 to 20 per cent. lighter than any other tire filler. A big proposition for dealers who are on the alert for more and better business. Write for details.

AMERICAN KUSHION KORE TIRE CO.
Buffalo, New York

RHINELAND BALL BEARINGS

"INSURANCE FOR BUILDER AND USER"

RHINELAND MACHINE WORKS CO. — 142 WEST 42ND ST. NEW YORK

FIAT

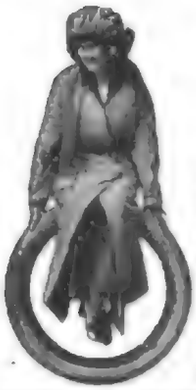
"THE MASTER CAR"

FIFTEENTH YEAR

6 Cyl. 50 H. P., $5,000 4 Cyl. 55 H. P., $4,500
4 Cyl. 35 H. P., $4,000
(Completely Equipped)

POUGHKEEPSIE F.I.A.T. N. Y.

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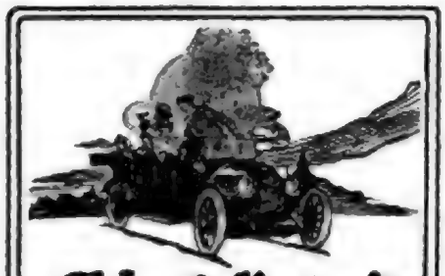
Kelly-Springfield
Automobile Tires

It's Kelly-Springfield quality and wear—not price—that we like to emphasize, for when you get mileage a few thousand miles greater than the average tire gives, the cost is just naturally reduced.

KELLY-SPRINGFIELD TIRE CO. **20 Vesey Street, New York**

Branch offices in New York, Chicago, Philadelphia, Boston, St. Louis, Detroit, Cincinnati, San Francisco, Los Angeles, Cleveland, Baltimore, Seattle, Atlanta, Akron, O., Buffalo.

The Hearn Tire & Rubber Co., Columbus, Ohio.
Hess Rubber Co., Denver, Colo.
Southern Hess & Woodstock Co., Ltd., New Orleans, La.
Savell Davis Rubber Works, Augusta and Savannah, Ga.
H. R. Olmstead & Son, Syracuse, N. Y.
Fering Tire & Rubber Co., Houston, Texas.
Todd Rubber Co., New Haven, Conn.
Atkinson Tire & Supply Co., Jacksonville, Fla.
C. D. Franke & Co., Charleston, S. C.
L. J. Barth, Rochester, N. Y.



Abbott-Detroit

"The demand of the day is that an organization shall be judged by its product and not by what it claims for itself" Keep this in mind when you examine these 1913 models

MODELS AND PRICES

30-40	Fore-door Roadster, 116-inch wheel base	$1700
34-40	5-passenger, Fore-Door Touring Car 116-inch wheel base	$1700
44-50	5-passenger, Fore-Door Demi-Tonneau 121-inch wheel base	$1975
44-50	7-passenger, Fore-Door Touring Car 121-inch wheel base	$2000
44-50	Battleship Roadster, 121-inch wheel base	$2150
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Advance Catalog on Request

ABBOTT MOTOR CO.
WATERLOO STREET DETROIT, MICH.
"Built for Permanence" "Guaranteed for Life"

Send Us Your Inquiries When in the Market for

Sheet Metal Stampings

Estimates Cheerfully Furnished

The Bossert Company
UTICA, N. Y.



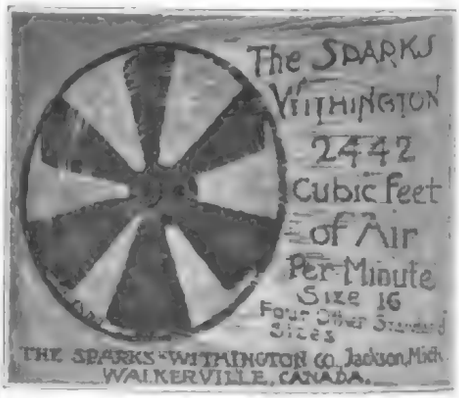
These Tires for You

Four corps of experts working in four of the best equipped tire plants in the world are operating as a unit to produce

UNITED STATES TIRES

Nothing of the kind has ever before been attempted in automobile tire manufacturing.

United States Tire Company
New York





CONTINENTAL

Six Cylinder - Unit Power Plant
Three Point Suspension

The Continental "Six" is maintaining, on the road at this minute, the good name made by our four cylinder types.

Built to accommodate any type of self-starter now made. Suitable for right or left hand drive.

Showing simple and efficient chain drive for starting motor.

4 and 6 cylinders
20 to 70 H. P.

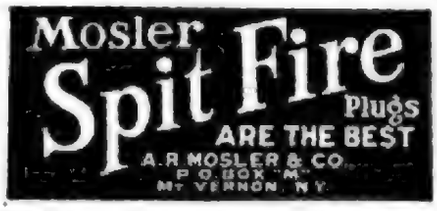
Write for booklets.

CONTINENTAL MOTOR MFG. CO., Detroit, Mich.
Factory Representative, K. F. PETERSON
122 S. Michigan Blvd. Chicago



Magneto Plugs cost maximum power out of engine.
EMIL GROSSMAN COMPANY, Mfr., New York and Detroit





Guide Motor Lamps
(ELECTRIC)

Write for "Guide Books" Nos. 1 and 2

GUIDE MOTOR LAMP MFG. COMPANY
Cleveland, Ohio



Tones down headlights for city driving and foggy nights—an auto necessity. Price 75c. per pair. Sells like hot cakes. Dealers, secure the agency quick.

F. H. TOBIAS
1931 Broadway, New York

INVADER OIL

"The Best the World Affords"

CHAS. F. KELLOM & CO.
Philadelphia Boston

NON-CARBON STARTER

The Starter Which Really Starts

The successful Starter for Fords as well as other makes. Combined Starter and Lighter, $35. Live Dealers given exclusive territory.

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AJAX EXTRA HEAVY NON-SKID TIRES

The Only Non-Skid Tires
Guaranteed for 5000 Miles

AJAX-GRIEB RUBBER COMPANY
General Offices: 1796 B'way, New York
Factories: Trenton, N. J. Branches in Principal Cities

GASOLINE TURBINES

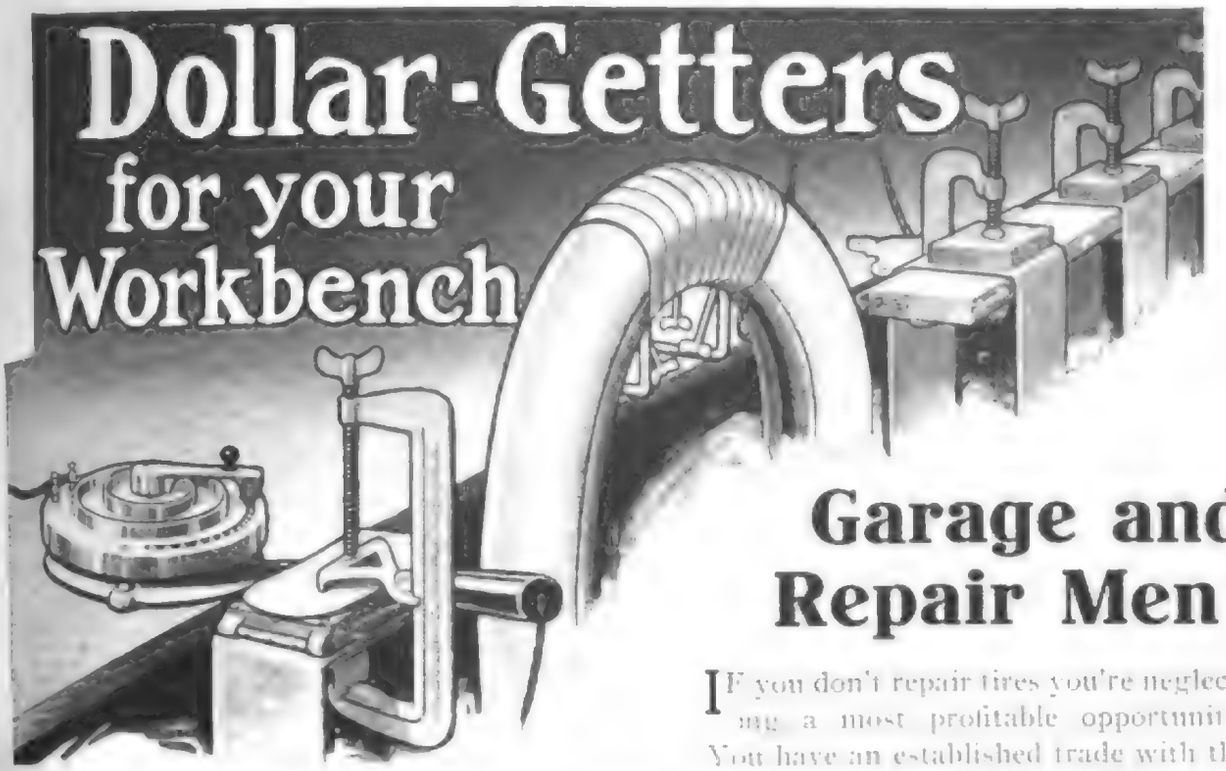
Half the size, Half the weight, Half the fuel, Half the friction
Smooth as Electric, Will replace any engine in any car
No Valves, No Springs
No Adjustment, No Noise
No Fly Wheel, No Muffler
No Back Pressure
Booklet Upon Request
There Isn't Much Left

SEMPLE S. SCOTT 1651 Marquette Bldg. CHICAGO, ILL.
Exclusive Territory Open for Live Agencies

The circulation of the Motor World is a guaranteed one, sworn to by an affidavit, which will be sent in detail to any one upon request.

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Dollar-Getters for your Workbench



Garage and Repair Men:

IF you don't repair tires you're neglecting a most profitable opportunity. You have an established trade with the people who have tire trouble. They'd rather have you mend their punctures and blow-outs than to have you send them to a tire-repairing plant.

A tire repair outfit will pay you big profits. It's a money maker for you as well as a convenience to your customers.

SHALER Vulcanizers

The workbench outfit shown above will handle every practicable kind of tire repairing—tube punctures to casing blow-outs. Each part is independent of the others; that is, you can start with one model of the Shaler line and increase as your work increases.

Heat comes from the most convenient source, electric current. Simply plug into any lighting socket. The vulcanizer heats while you prepare the repair—no smoke—no danger of fire. An automatic temperature control regulates the amount of current, so that the vulcanizer is held at the vulcanizing degree indefinitely. Anybody can make perfect repairs with the Shaler. We furnish instructions that anyone can understand and follow.

We also have a complete line of steam and electric vulcanizers for garages and motorists who do not have access to electric current.

See Them at the Show February 1-8 182-183 Annex.

Send the Coupon Today

You'll get a complimentary copy of our famous booklet, "Common Sense About Tire Repairs." Contains a lot of valuable pointers for the wide-awake garage man

C. A. SHALER CO. 403 4th St. Waupun, Wis.
Send ... Name ... Address ...

C. A. SHALER COMPANY

403 Fourth Street **Waupun, Wis.**

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For Sale—Wants—Exchange

15 cents per line of six words, cash with order. — In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

MANAGER of one of largest New York city garages wishes to make new connection with garage in city. BOX 242, care Motor World.

APPLY Boyer's Automatic Refinisher to your automobile today. Tomorrow it will look as though it just came from the factory. Finest thing in the world for dull hoods. Easily applied with cheesecloth. Particulars free. BOYER CHEMICAL LABORATORY CO., State and Michigan Sts., Chicago, Ill.

AUTOMOBILE FOR SALE—1912 Marmon Speedster, Indianapolis Speedway type car. A-1 condition; run 4,000 miles. For particulars apply W. F. BURROUGHS, 66 Midland Ave., Arlington, N. J. Tel. 29 Arlington.

PATENT automobile testing device; armature rack power transmitter; new idea; need money; sell, royalty. State rights. Write immediately. FRED I. SPELLMAN, 129 W. 4th St., Mansfield, Ohio.

WANTED—Three or four 1912 models and one 1913 model five-passenger unused automobiles. Will give a piece of level, black soil grain land 60 miles of Iowa in Southern Wisconsin, at its present cash sale price. This is not cutover or stumpage land. O. EDENBURN, 124 W. Third St., Davenport, Iowa.

OFFICE MANAGER, good executive and salesman. Seven years in automobile accessories; competent to handle correspondence and keep books; wants to relocate. BOX 240, care Motor World.

OLDSMOBILE; 4-cylinder; 5 passenger; good tires; equipped; good condition; looks good; $450; cost $3,000. FARQUHAR, 103 Mott St., New York.

FOR SALE—Garage, fully equipped, within 50 miles of New York City. Two-story brick building, steam heat, 1,000-gal. gas tank, full stock of oils, greases, supplies and accessories. Agency for two standard non-competing cars. Storage for 35 cars. This is a rare chance for a live man. Ill health of owner reason for selling. Address Motor World, Box 241.

FOR SALE—Well located garage on Main street. WELLS GARAGE, Hobart, Ind.

AR-GEN-TOR will deposit a beautiful silver plate on your brass trimmings in one minute. Absolutely reliable. Price $1.00. Send for package. Quit polishing brass. FOREST CITY SALES CO., Fremont, Neb.

PEERLESS EXTRA FINE BLACK JAPAN.
Covers solid one coat for enameling lamps, radiators and fenders. No undercoat required. Heat does not affect it. Ask your garage and supply dealer
The Columbus Varnish Co., Columbus, O

WANTED TO BUY—Five or seven passenger automobile for cash, in good condition; no dealers. 172 Pacific St., Brooklyn, N. Y.

KEROSENE FOR AUTOMOBILES.
New Model B uses successfully half and half mixture lowest grades kerosene and gasolene. Satisfaction guaranteed or money refunded. Greatly increased power, very slow speed on high. Starts easy at zero. Special agents' prices. Dept. 8. THE AIR-FRICTION CARBURETOR CO., Dayton, Ohio.

TWO expert mechanics will call and give estimate to overhaul or adjust car in you own garage. Address E. BELTZ, 2531 Belmont Ave., Bronx.

BARGAIN—Two new and never used 34 x 4 Davis Armor, Model B, Tire Protectors; cost $54.00. Will take $32.00. Disposed of car before "Armors" arrived. BOX 231, care Motor World.

PEERLESS LINING DYE.
Dyes the cloth linings of tops and curtains a black, uniform color, covering up water stains and grease spots. Does not wash off. Ask your garage and supply dealer.
The Columbus Varnish Co., Columbus, O

VICTORIA TOPS AND SEAT COVERS
That's our specialty, but we make a full line as well. Any style and every one the best that high-grade materials and experienced workmen can make. Prompt service assured. We're glad to estimate special work or quote you prices on stock tops. CENTRAL AUTO TOP CO., Indianapolis, Ind.

SURPLUS STOCK BOUGHT
Cars, Bodies, Tops, Tires, etc.
Cash transactions. Quick business.
20TH CENTURY CO., 1700 B'way, N. Y. C.



An ad. like this will cost you $1.35 for each insertion.

These columns offer you an opportunity to appeal to an audience of 8,000 readers whose merchandising taste is being cultivated

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For Sale—Wants—Exchange

15 cents per line of six words, cash with order. — In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

WANTED—A high class draughtsman, having had motorcycle experience. In making application state previous experience and salary expected. THE POPE MFG. CO., Westfield, Mass.

7-PASSENGER Franklin, 6 cylinders. Cost $4,250. Splendid condition, $1,000. BOND MOTOR CO., 1615 Grand, Kansas City, Mo.

PEERLESS AUTO TOP DRESSING.
A waterproof dressing for leaking mohair and duck tops and curtains. Makes old and faded tops look like new. Ask your garage and supply dealer for it.
The Columbus Varnish Co., Columbus, O.

WANTED—A promoter that has the ability to sell State Rights for the best Tire Filler on the market, to a strictly high grade man, that can get results, money is no object. RUSH. NATIONAL TIRE FILLER CO., Grand Rapids, Mich.

FOR SALE—1910 Peerless limousine; newly done up and relined; price $2,000. 1730 Land Title Bldg., Philadelphia, Pa.

AUTOMOBILE CYLINDERS reground, new pistons and rings fitted. Garage air compressors. CAST IRON BRAZING CO., Manchester, N. H.

1913 PACKARD—Will dispose of my new 1913 6-cylinder, 7-passenger touring car at a bargain if taken immediately. Address H. M. WALLIS, JR., Racine, Wis.

AUTO LISTS, owners, etc., of any State. S. H. CARROLL, JR., Albany, N. Y.

PEERLESS LEATHER TOP DRESSING
An oil preparation that softens the leather and pantasote. Makes old tops look like new. Ask your garage and supply dealer for it.
The Columbus Varnish Co., Columbus, O.

ARE YOU in need of any additional help in any department of your business? Are you out of employment or looking for a better connection? Have you second-hand apparatus of any kind or do you want to buy second-hand material. Have you a factory site for sale or do you want to buy one? If so, use the Want and For Sale column of the Motor World. Seven words to the line, fifteen cents a line. Advertisements can be inserted over a number when it is desired and identity of the advertiser will be kept confidential.

PEERLESS BACK AND CUSHION DRESSING.
Softens the leather and will not crack, wash or rub off. Makes old leather look like new. Dries in twenty minutes. Ask your garage or supply dealer.
The Columbus Varnish Co., Columbus, O.

BROKEN Cylinders and Crankcases—Send them to be made good as new at fraction of replacement cost. Scored cylinder repaired, $12. No new piston and rings required because bore is not enlarged. Where cylinders are worn (not scored from loose wrist pin) reboring is only remedy. We do it expertly. Write for complete information and estimates. WATERBURY WELDING COMPANY, Waterbury, Conn.

DRAGON REPAIR PARTS.
We manufacture and keep on hand all repair parts for the Dragon cars. We make a specialty of repairing this machine. PHILADELPHIA MACHINE WORKS, 67 Laurel St., Philadelphia, Pa.

WANTED—A first-class man to take the agency for the latest invention on the market, a rubber cover for automobile handles called Steerease; write for full particulars. Address DEPARTMENT E, GOODYEAR RUBBER HOSE AND PACKING CO., 221 Chestnut St., Philadelphia, Pa.

FOR SALE—1908 Winton touring car, 7-passenger, good running order, fully equipped; price $400. Address BOX 230, Motor World.

RURAL Parcels Post Delivery Car—Any party with capital and push interested in placing one on the market, correspond with E. P. COWLS, Sparta, Mich.

PEERLESS EXTRA FINE BLACK BAKING JAPAN.
Bakes either to a high gloss finish, egg-shell gloss or dull finish on lamps, radiators and fenders. Will not crack, chip or peel. Ask your garage and supply dealer.
The Columbus Varnish Co., Columbus, O.

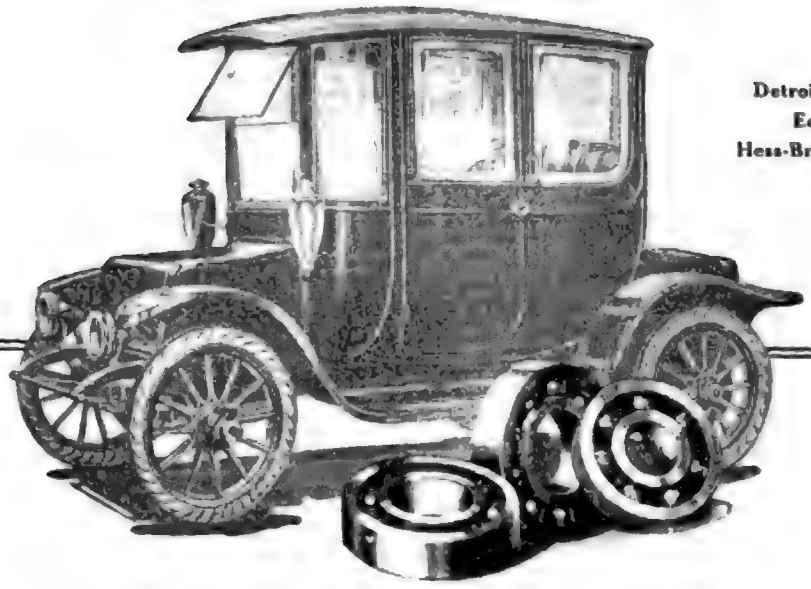
BROKEN CRANKSHAFTS, cylinders, crankcases, flywheels, gear teeth, pistons, perfectly welded and machined ready to replace. Guaranteed and references. Machinery up to 5 tons welded. ATLAS WELDING WORKS, 74-76-78 Irving St., Rahway, N. J.

FOR SALE—One Ford town car body. Fits any Model T Ford chassis. BENNINGTON GARAGE, Bennington, Vt.

weekly to the highest degree by our articles on "Wide Awake Merchandising." Look at the cost as shown in the margins.

An ad. like this will cost you 60c. for each insertion.

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Detroit Electric Coupe
Equipped with
Hess-Bright Ball Bearings

"Other Things Being Equal, The Polish is the Ball"

The most heavily stressed portions of a loaded ball are the points of contact. These points flatten microscopically, so that they are in reality areas, not points.

If these contact areas are smooth, their whole surface is brought into action. If they are rough, the load that should be distributed over the whole surface is concentrated on the microscopic high spots, which are correspondingly overloaded.

These overloaded high spots do not wear smooth beyond a certain point; their tendency is to wear rough or flake out.

In an anti-friction bearing, it is only the first thousandth of an inch or so of surface that really counts for wear. After that first polish is gone the surface crumbles quickly. Other things being equal, the smoothest ball and smoothest race are the longest lived.

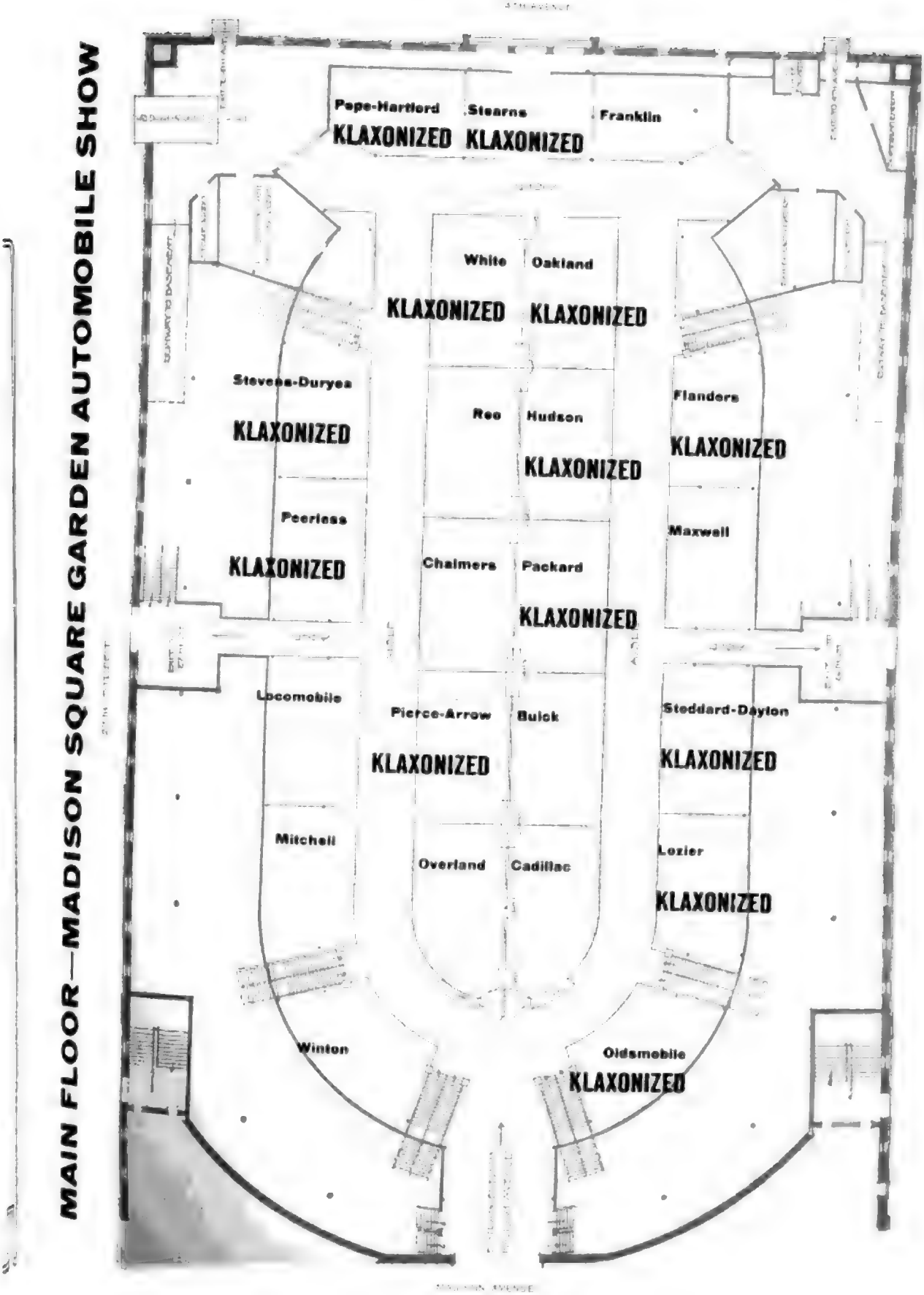
Hess-Bright balls and races receive a mirror-like final polish after they have been brought by grinding to perfection of form and size. Under the strongest pocket magnifier their surface remains smooth. When they are properly mounted and protected from dirt and corrosion, wear in the ordinary sense is absent, because there is no friction to cause wear.

Because Hess-Bright bearings are free from wear, it is practicable to protect them by closures far more effective than those that can be used with bearings subject to wear. Dirt and water can be excluded and the lubricant retained indefinitely. These closures insure to the user the full measure of durability to which the high quality of Hess-Bright Ball Bearings entitles him.

Our booklet, "Ball Bearings That Endure—And Why," tells more. Sent free to any address on request

THE HESS-BRIGHT MANUFACTURING COMPANY
59 East Erie Avenue, Philadelphia, Pa.

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Studebaker

A Studebaker "25" at $885 Sells Itself

It isn't necessary for a Studebaker Dealer to worry over selling talk.

Show a prospective customer a Studebaker "25" and watch him reach for his check-book.

The mechanical perfection of the motor; the simplicity of the chassis, the full elliptic springs, semi-floating rear axle and irreversible steering gear appeal to the man who knows the good points of a motor car.

The pleasing cowl design of the body, the comfortable fullness of the tonneau, with the fine upholstery, deep cushions, Studebaker jiffy curtains, electric horn—in fact the unusual richness and completeness of the Studebaker "25"—make it the easiest seller in motordom.

And no other car in the market is made under such favorable conditions. The Studebaker "25" is made by the same skilled experts, of the same tested materials and in the same plant as is the Studebaker "35" and the Studebaker "Six."

In roadability, appearance and ability to go anywhere, under any circumstance the Studebaker "25" is in a distinctive class by itself.

STUDEBAKER CARS

"20" Delivery Car	$800	"30" Touring Car	$1190	"Six" Touring Car	$1550
"20" Roadster	835	"35" Touring Car	1290	"Six" Roadster	1550
"25" Touring Car	885	"35" Sedan Type	2050	"Six" Limousine	2500
		"35" Coupe	1850		

All prices for cars fully equipped F. O. B. Detroit

THE STUDEBAKER CORPORATION

DETROIT, MICH.

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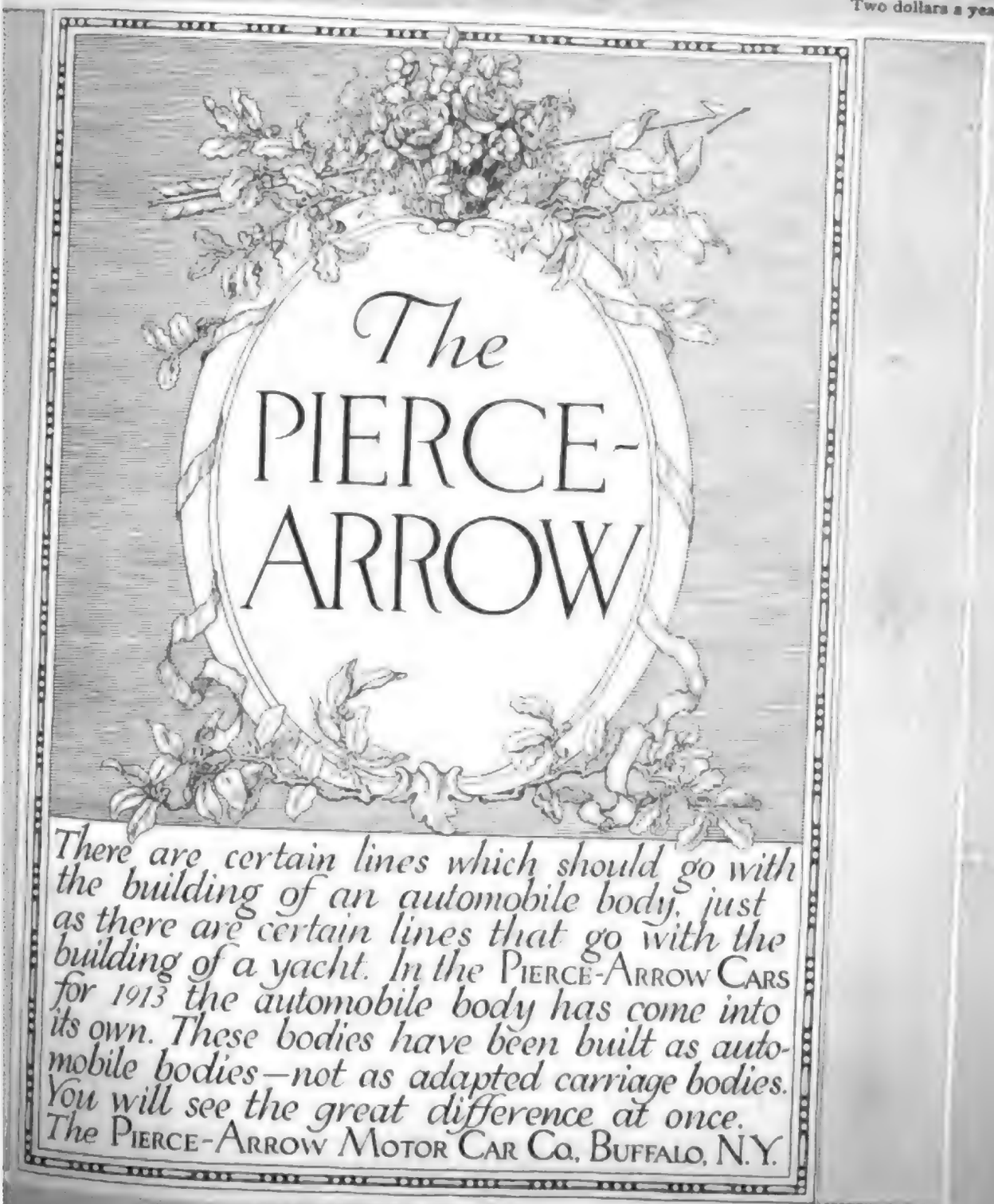
MOTOR WORLD

rade Paper Giving the World's Motor News

KIV

New York, January 30, 1913

Ten cents a copy
Two dollars a year



Weekly by the Motor World Publishing Company, 1600 Broadway, New York

Truffault-Hartford SHOCK ABSORBER

Increased Sales for YOU

---if the car YOU sell is Truffault-Hartford equipped.

Your interests are best served when you can meet the demand of owners for Truffault-Hartford equipment on the cars they buy.

Leading manufacturers---producing 27 popular cars---recognize the insistence of the demand for this necessary device. THEY equip their cars with Truffault-Hartfords---at the factory.

Does the manufacturer you represent recognize this demand? Truffault-Hartford equipment---on any car---enhances its value as a car and a selling proposition. Insist that your manufacturer includes Truffault-Hartfords on the car you sell. It means increased sales for you.



Hartford Suspension Company

EDW. V. HARTFORD, President

Factory, 164 Bay Street, Jersey City, N. J.

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NEWARK—289 Halsey St.
PHILADELPHIA—1437 Vine St.
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BRETTON WOODS, N. H.—Bretton Woods Garage

DEALERS

Be Sure Your Cars Are

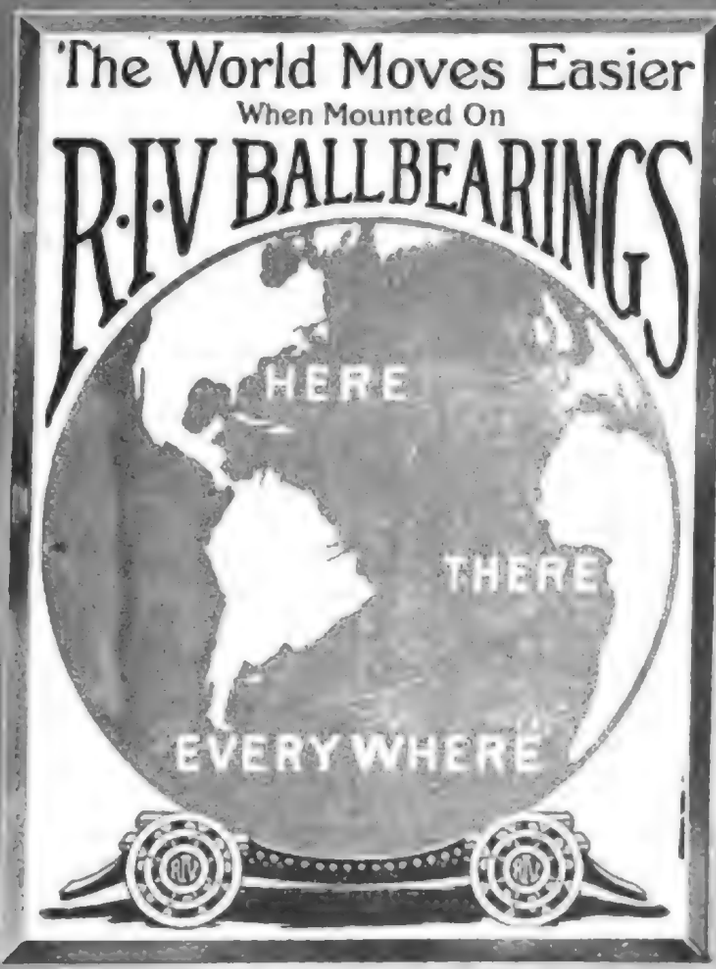
EQUIPPED

With

The World Moves Easier

When Mounted On

R·I·V BALLBEARINGS



DEALERS

Bearings of Recognized Worth are Ear Marks of Car Quality

DEALERS

Are the Cars You Represent R.I.V. Equipped?

R. I. V. standing in the field is due to the unique accuracy of the bearings as a whole and to the superior hardness and tensile strength of the balls and races as well as the *substantial* construction of the retainers.

The R. I. V. guarantee of accuracy is absolute. Consistent and constant tests maintain it and even under the heaviest loads these bearings revolve with unusual celerity but minus excessive side play.

Conservative manufacturers equip their cars with R. I. V. Ball Bearings.

R. I. V. COMPANY, 1771 Broadway, New York

Fedders Radiators



The square tube radiator is acknowledged to be superior to any other form of construction and Fedders design and methods of manufacture give Fedders radiators a standing second to none in the field.

Fedders Square Tube Radiators offer a maximum of radiating surface — all four sides are surrounded by water—cannot clog and can be repaired in short order by any tinsmith.

While we specialize on square tube types, we are also equipped to build on any specifications that may be furnished. Send us blue prints and our engineering department is at your disposal for co-operative work.

FEDDERS MANUFACTURING WORKS

BUFFALO, N. Y.

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The Atwater Kent Ignition System



Time was when automobile engineers and the general motoring public thought they must equip their cars with a magneto. Today this idea is fast waning—in fact, it has been discarded by many of the foremost automobile engineers and discriminating motorists who are now demanding a more dependable source of current on their cars.

The increasing use of electric lighting and starting equipment necessitates an ignition system better than the magneto—a system producing a uniformly hot spark at low speeds as well as high—a system giving a hot starting spark with the motor at a standstill—a system that is simple in principle and mechanism as well as in operation, and reasonable in initial and maintenance cost—in brief, a system of ignition that will measure up to the highest requirements of the most modern automobile practice.

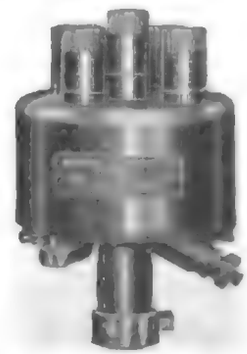
Such is the Atwater Kent Ignition System—embodying the best features of both magneto and battery, without the weaknesses of either.

Remember the Atwater Kent System can be easily and quickly installed on any standard make of motor, new or old, without the price of a magneto.

If you have an unsatisfactory magneto, or if your motor is not equipped with a half time shaft, you can use the Atwater Kent System by means of our magneto gear mounting, the cost of which is nominal.

In addition to our standard Type F System, we are marketing a new model—Silent Type K with automatic spark control and insulated primary circuit.

Whether you are interested in motor cars as manufacturer, dealer, owner, or prospective buyer, you should have a copy of our booklet "D." It covers the subject authoritatively and thoroughly and even the most experienced will find it interesting reading.



ATWATER KENT MFG. WORKS

4940 Stenton Ave. Philadelphia, Pa.

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$985
F. O. B. Toledo
Completely Equipped

Overland

$985
F. O. B. Toledo
Completely Equipped

High-Priced Feature No. 13

Overland 69T bodies pass through 22 painting, rubbing and varnishing operations.

The Model 69T boasts a metal unbreakable body which can not shrink or warp. The non-porous surface allows the most brilliant, mirror-like finish.

Each radiator receives four coats of separately baked enamel. Fenders, windshield, dust pans, lamp brackets, top irons, hoods, etc., are treated likewise.

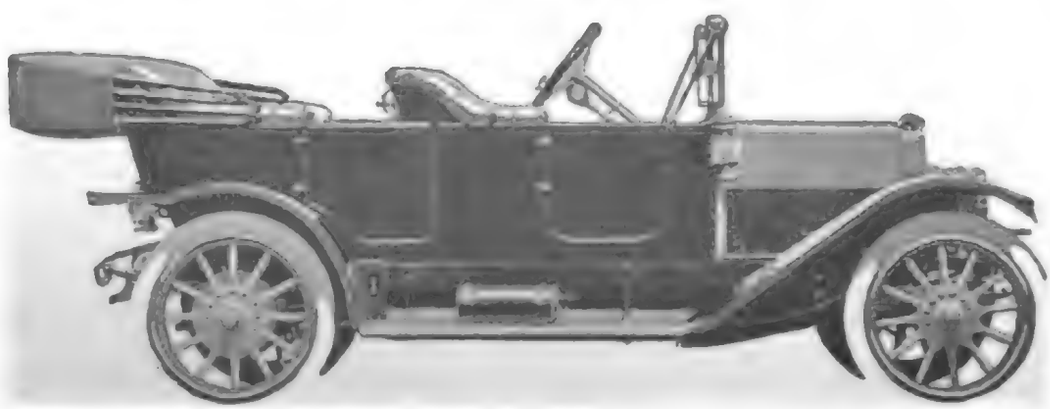
Wheels are painted with compressed air brushes. This drives the pigment into the pores—guarding against moisture.

All bright parts of the Model 69T are heavily nickeled.

This car's beauty and finish is the equal of any $1200 car made.

Write today for literature. Please address Dept. 50.

The Willys-Overland Company
Toledo, Ohio



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MOTOR WORLD

Vol. XXXIV New York, U. S. A., Thursday, January 30, 1913 No. 6

MAXWELL PREPARES TO TEST RIGHT TO USE OF HIS NAME

Quietly Organizes His Own Car-Building Company and Challenge Is Plain—Project Is Distinct from Briscoe's.

Before the purchasers and reorganizers of the United States Motor Co. obtain a clear title to the name Maxwell Motor Co., which they have selected for the reorganized establishment, after Standard Motor Co. was discarded, they probably will have to fight for it. For J. D. Maxwell himself has organized and incorporated under New York laws the J. D. Maxwell Motor Corporation, and while he does not say in exact language that he proposes to test the right of the reorganizers to use his name, he did say to a Motor World man that he intends to discover exactly what rights he has in the premises, which amounts to about the same thing.

He admits that the reorganizers of the United States Motor Co., which originally was built around the Maxwell-Briscoe corporation, are entitled to employ the hyphenated Maxwell-Briscoe name if they elect to do so, and also to use the name Maxwell as applied to motor vehicles, but his conversation made very plain that he doubts their right to use the name Maxwell as the title of their new corporation.

Mr. Maxwell has been rather quiet since the failure of the big company in September last, which swept away most of the handsome fortune which he had built up after years of industry, and is not quite ready to make public the details of the newly organized J. D. Maxwell Motor Corporation, which is capitalized at the nominal sum of $10,000. He admits that it is his purpose to manufacture a car, and that several men of means and influence probably will be associated with him; but more than this he will not say at this time. He made clear, however, that his old associate, Benjamin Briscoe, is not and will not be identified with the J. D. Maxwell Motor Corporation, which is separate and distinct from the new company which Briscoe will organize to manufacture the under-$1,000 car which he is now developing in Europe.

Settles $300,000 Suit Against Michelin.

The differences which a year and a half ago caused Frans Poel and Charles H. Arnold, New York rubber brokers, to file suit for $300,000 against the Michelin Tire Co., of Milltown, N. J., in the Supreme Court for New York county, have been settled out of court and the several actions have been formally discontinued. The trouble arose from contracts which the Michelin company made with the brokers for crude rubber, the Poel-Arnold contention being that the Michelin company declined to take the rubber it had ordered, while Michelin questioned the quality. Changes in the price of crude rubber also had to do with the case, the price of rubber taking a decided drop after the Michelin company made its contracts.

John Splitdorf to Re-enter Business.

John M. Splitdorf, who disposed of his interests in Chas. F. Splitdorf, Inc., when the latter was taken over in May last by the Splitdorf Electrical Co. of Newark, N. J., and became one of John F. Alvord's enterprises, is preparing to re-embark in the business. He has designed an electric starter and lighter, which is said to incorporate uncommon ingenuity, and already has opened an office at 136 West 52nd street, New York. It is probable that a company will be built around the device. A. L. Kull, one of the veterans of the industry, and E. LeRoy Pelletier are among those interested with Splitdorf in the enterprise.

Willys Sails for Long Tour Abroad.

John N. Willys, president of the Willys-Overland Co., sails to-day for an extended tour of the "other side" which will reach into Egypt. He will be absent about three months.

TIRE MAKERS DRAW LINES TIGHTER ON GUARANTEES

Adopt New Form That Is Far Reaching and More Specific—Mileages and Tire Fillers Both Tabooed.

While the tire manufacturers who are included in the membership of the Motor and Accessory Manufacturers were in New York for the purpose of attending the show, they made use of the occasion completely to overhaul and revise the guarantee which hitherto has applied to their productions, or, at any rate, to their pneumatic tires. The revision had been in the hands of a committee for some time, and as finally adopted is far-reaching and so specific as to leave little to be misunderstood. It is as follows:

"We guarantee all pneumatic automobile tires, bearing our name and serial number, to be free from imperfections in material and workmanship. Tires returned for consideration under this guarantee will be accepted only when all transportation charges are prepaid. If, upon examination, it is our judgment that tires are defective, they will be repaired or replaced at our option.

"When tires are replaced by us, charges will be made to owners at the time new tires are delivered, for such amounts as in our judgment will compensate for the service rendered by such replaced tires.

"Tires worn out in usual or unusual service, abused knowingly or unknowingly, misused, used on rims not bearing these stamps ———, injured through accident or design are not covered by this guarantee.

"——— pneumatic automobile tires are not guaranteed to give any definite miles of service, and any and all guarantees are expressly waived by any purchaser of these tires who uses therein any substitute for air; or who uses them under weights in excess of those for which the various tires are recommended, or who does not keep tires inflated to the pressures recommended."

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"PROTECTIVE" PROMOTER GETS LONG TERM IN PRISON

Sponsor of Chicago's "National Association" Proves To Be Man With Unsavory Record — Forgery His Chief Profession.

Due to the arrest and exposure of the man responsible for its creation, William J. Reid, a blight has fallen on the National Automobile Protective Association, which, in October last, established an office in the Steger building in Chicago, and which more or less amusingly proposed to "protect" or dominate or otherwise do things to or for the garage business of the United States.

The Reid company styled itself the general agent of the so-called association, but although Reid himself professed to be a real estate broker, and the Reid company to be engaged in the real estate brokerage business, the line between it and the association was an almost invisible one.

Reid was arrested in Sanger, Cal., where he called to draw against a draft for $15,000 which he had deposited and where a trap had been laid for him. After his arrest it came out that he had spent nine years in prison, having been arrested first in his native city, Rockford, Ill., in 1895, where he was charged with arson. After the jury disagreed, Reid disappeared and took the name of a Rockford minister, L. A. Hoffman, and apparently started on a career of forgery which extended practically from ocean to ocean and which entailed the use of many names. He has "done time" in prisons as far removed as California and Massachusetts.

When, under his correct name, he opened up in Chicago and undertook the exploitation of the National Automobile Protective Association, his intimates in that project apparently knew nothing of his career and were genuinely amazed at the disclosures which followed Reid's arrest.

When apprehended in California, he wore a red wig, false whiskers and two complete sets of clothes, and in his baggage were found four other disguises and a small printing press, which, it is stated, was used to print cards and letterheads to meet his various emergencies.

The purpose of the National Protective Association, which, like those of many similar organizations which preceded it and all of which came to naught, was to get $25 from dealers and garagemen and $10 from car owners, the pet theory being that the car-owning "member" could be guided into the "association's" garages, where he would leave a share of his coin, while, in turn, the garage would grant more or less special rates and service, and the result would be beneficial all around.

Reid provided the garages with handsome gold-trimmed certificates and outlined a code of standards to which they must adhere. If they failed to adhere to them, or in towns where garages did not meet the Reid "standard," the association grandiloquently announced its intention of building garages of its own.

When his "protective" scheme reached the gold certificate stage, Reid tendered practically all of the automobile publications contracts for 52 pages of advertising, which most of them accepted, and in due course the advertisements of the association appeared in spread-eagle type. One of the contracts was tendered Motor World, but before accepting it a series of questions concerning the internal make-up of the "association" and the previous connections of those who comprised it were submitted to the Reid company. The questions never were answered, and the association's advertisements never appeared in the pages of Motor World.

Pelletier Rejoins the Flanders Camp.

E. LeRoy Pelletier, after all, has accepted the post of advertising counsel for the Maxwell Motor Co., acting through the Campbell-Ewald Advertising Agency, to which he has become attached. The strained relations which existed between himself and his "one best bet," W. E. Flanders, president and general manager of the Maxwell Motor Co., as the result of a Christmas spat, have been relieved and Pelletier has ceased to call Flanders a "paper man," and the two now talk almost as kindly of each other as they did in the days of yore. Pelletier, however, will not devote all of his service to the Maxwell interests. He will also handle the advertising of the new electrical company which is being organized by John M. Splitdorf, and it is understood that in all probability he will likewise have charge of the advertising account of one of the largest tire companies.

Pioneer Dealer Makes an Assignment.

The K. A. Skinner Co., of Boston, Mass., has made an assignment for the benefit of its creditors to Clarence F. Newton. Although comparatively few tradesmen are aware of the fact, Kenneth A. Skinner, who practically comprises the embarrassed company, was one of the first, if not the first, man to engage exclusively in the retail sale of motor vehicles in this country. As long ago as 1897 he was importing De Dion tricycles and motorettes. At that time he established a store on Massachusetts avenue, in Boston, his chief source of income being receipts from rental fees and his chief patrons Harvard students.

FORECLOSURE OF MORTGAGE COMPLICATES ATLAS'S DEAL

Bank Forces Sale of Springfield Car Company's Plant Regardless of Orson Negotiations—One Loophole Still Open.

The affairs of the Atlas Motor Car Co., of Springfield, Mass., which has been in a questionable state for several months, took a sudden and unexpected turn on Saturday last when the Union Trust Co., of that city, foreclosed a second mortgage for $19,400 which it held. The public sale which followed resulted in the purchase of the Atlas plant by Charles D. Whitney, manager of the Victor Sporting Goods Co., of Springfield. The price paid was $55,000. In addition to the second mortgage which precipitated the trouble, a first mortgage of $30,000 was held by the Hampden Savings Bank.

The Atlas company has been very much hampered by lack of capital and the failure of the Atlas Engine Works of Indianapolis last summer added greatly to its embarrassment, the supply of Atlas-Knight engines for which it had contracted being suddenly cut off.

The foreclosure proceedings will serve to complicate negotiations which were in progerss between the Atlas Motor Car Co. and the promoters of the so-called Orson merger, in which the Brightwood Motor Mfg. Co. and the Springfield Metal Body Co. are the chief factors. The Atlas company hoped to be included in that project and hope has not been entirely abandoned, as, if satisfactory arrangements can be made, it is probable that the Atlas plant can be re-purchased from the Victor Sporting Goods people, who acquired it on Saturday last.

Oil Account Causes Legal Friction.

A bill of $85.57 for goods figures in a suit filed this week in the Supreme Court for New York county by the New York Lubricating Oil Co. against Herbert A. Clouse, who trades as the New York Garage & Supply Co., in Mt. Vernon, N. Y. The account accumulated between July 31 and October 15, 1912, and the claim is made that but $25 was paid on the total, leaving a balance of $60.57.

South Americans Secure Stewart Trucks.

Pratt & Co. of Buenos Aires, Argentina, who have handled American goods at various times for many years, have taken on the sale of Stewart motor trucks, after having the market investigated by a personal representative. The first two trucks already are en route to Buenos Aires.

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WEED GUARANTEES DIVIDENDS ON AMERICAN CHAIN SHARES

Offer of American Stock Discloses Little Known Relationship — Also Makes Plain Some of Weed's Extensive Plans.

In offering to the public the American Chain Co.'s issue of $250,000 7 per cent. cumulative preferred stock, some additional and hitherto unknown particulars of that company have become common property.

The American Chain Co. itself was organized in December last, with an authorized capital of $750,000, to take over the chain business of the Oneida Community, Ltd., in Sherill, N. Y., which in June, 1912, had been purchased for $316,000 cash by W. B. Lasher, president of the Weed Chain Tire Grip Co.

It now transpires that, excepting only the qualifying shares of directors, Lasher owns all of the Weed shares, and the Weed company, in turn, owns all except the directors' qualifying shares of the American Chain Co. which is and will continue to be the source of supply for the Weed company. Its production of Weed chains, however, amounts only to about 25 per cent. of its total business, its present plant having a capacity for more than 300,000 feet of chain per day. In addition, plans are now under way for the acquisition of another palnt, probably in Bridgeport, Conn., where the Weed company itself is located.

Furthermore, and as was indicated by Motor World several weeks since, the Weed company now is negotiating with the British Parsons Co. on a basis which practically will amount to a consolidation of the Weed and the Parsons companies and which will result in the employment abroad of the same vigorous methods which have built up the Weed business in America to such handsome proportions.

All of the common stock of the American Chain Co. is in the Weed treasury, the 7 per cent. dividend on the preferred shares which are being offered to the public guaranteed for 10 years by the Weed company, whose profits, it is stated, have averaged at least 10 times the entire dividend required for the preferred stock of the American company.

During the six months, to December 15th, in which Lasher has owned the latter, its gross receipts have amounted to $202,745 and the cost of manufacturing to $117,024, its balance, after meeting all other expenses and including undivided profits—$57,435—being $47,956.

The total assets of the American Chain Co. are $820,084, of which $43,378 is represented by good-will, patents, etc., and $225,061 by machinery and equipment.

The American Chain preferred is offered at par and dividend and is redeemable until January 1, 1918, at 110 and accumulated dividends, a sinking fund of one-half of the earnings of the company in excess of 10 per cent. dividends on its common stock being provided for the retirement of the preferred.

Lynn Show Leads Dealers into Court.

Because the Lynn (Mass.) show, which closed on Saturday last, was held in the local armory instead of in the garage of L. D. Robbins, where it was held last year and where it first was to be staged on this occasion, a fine little tempest in a teapot has arisen and found its way into court. L. D. Robbins, the owner of the garage involved, is a former president of the Lynn Automobile Dealers' Association, and with Winthrop W. Whitney he has instituted suit against five other men who had to do with the show, and it is intimated that the litigation has just begun. Robbins claims to have expended $80 in preparing his garage for the show and is suing for the amount of the bill. He names as defendants William H. Bennett, Warren H. Beede, Stephen R. Tierney, Frank Plumstead and Fred H. Plumstead.

Fireball Appeals to Highest Court.

Following the recent decision by the United States Circuit Court of Appeals, in the suit of the Prest-O-Lite Co. against the Searchlight Gas Co., that the Claude and Hess patent, No. 664,383, under which the former brought suit, had expired, the Fireball Gas Tank & Illuminating Co., of St. Louis, has asked permission to appeal to the United States Supreme Court from an order of the Circuit Court of Appeals for the Eighth Circuit, made in September, upholding a preliminary injunction granted to the Prest-O-Lite Co. in the District Court. The Fireball company in its petition for a writ of certiorari includes the statement that a Circuit Court has just overthrown the patent. Because of the infrequency of favorable action on requests to appeal in patent litigation, the unusual is not anticipated in this instance.

National-Acme Cuts Second Melon.

The National-Acme Mfg. Co. of Cleveland, O., manufacturers of automatic screw machines and their products, which is closely identified with the automobile industry because of its many automobile plants, has declared a stock dividend of 33 1/3 per cent., payable out of the treasury. It is the second melon which the company has cut within a period of two years. In 1911, when it increased its capital from $1,500,000 to $2,500,000, it paid a 20 per cent. stock dividend.

U. S. MOTOR REORGANIZERS BLOCKED BY INDIANANS

Secure Order Restraining Possession of Maxwell Property—Reorganization Plans Undergo Changes—May Drop Stoddard-Dayton.

Despite the sale on January 8th of the United States Motor Co. to the reorganization committee, the reorganizers are not yet in full possession of all of the property. There remain several knots to be unravelled, the hardest of which apparently grows out of the action of the Indiana creditors of of the Maxwell-Briscoe Motor Co. who sought to have the Maxwell plant in New Castle, Ind., thrown into bankruptcy.

Notwithstanding the bankruptcy petition which was pending at the time, the New Castle property was included in the sale authorized by the Federal court in New York, and J. W. Wellington, whom the reorganizers had appointed manager of the plant, actually had taken possession, replacing Frank E. Smith, the former manager, who also had been acting as receiver for the Indiana property.

Wellington's possession of the property was short-lived, however, as on Thursday last the Indiana creditors secured from Judge Anderson, in the Federal court in Indianapolis, a restraining order preventing the receivers of the Maxwell-Briscoe Motor Co. from turning over the property to those who were termed the "alleged purchasers." The restraining order also includes the Maxwell factory at Tarrytown, N. Y. Smith, therefore, resumed control of the New Castle plant as receiver, and W. E. Strong and Roberts Walker remain receivers of the Tarrytown plant until the knot is untied.

Even in Indiana there were those who supposed that the action of the Federal Court in New York approving the sale of the property terminated the bankruptcy proceedings in Indiana, and the action of Judge Anderson was, therefore, in the nature of no mild surprise.

The bankruptcy petition will be heard next week, at which time the reorganization committee will, of course, oppose it. Meanwhile, however, the tardy petition in bankruptcy filed by three minor creditors against the United States Motor Co. itself in the United States court in New Jersey has been dismissed, but the minority stockholders of the Columbia Motor Car Co. who were denied the right to intervene in the receivership proceedings in New York are pressing their case. They are represented by Attorney Edo E. Mercelis, who has perfected their appeal, which will be heard next month.

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The plans of the reorganizers are but slowly unfolding and, according to usually reliable sources, they have undergone a considerable change since first outlined. At that time, it was given out that the Maxwell and the Stoddard-Dayton cars would be the only cars continued, and it was not wholly a state secret that the manufacture of the Columbia would be abandoned and the Columbia factory in Hartford be devoted to the manufacture of parts. According to later reports, however, it has been decided to discontinue the Stoddard-Dayton and not only to continue the production of the Columbia but to do so through the medium of a separate company, which will continue to bear the style Columbia Motor Car Co. and which will continue the higher priced Knight-engined cars.

As the Stoddard interests were rarely at peace with the others in the United States Motor Co., it appears not improbable that disinclination to continue the use of the name Stoddard in any way has to do with the case. However, Henry V. Poor, chief counsel for the reorganization committee, stated to a Motor World man this week that if it is the intention to continue the Columbia Motor Car Co. as a separate corporation, or in any other way, he was not aware of the fact; and he smiled his usual cheerful smile when he said it.

Walter E. Flanders, the president of the reorganized company, and W. F. McGuire, the vice-president, have been making the rounds of the several properties, and while in Dayton last week are quoted as saying that the high-priced cars will be made in Hartford and the lower priced cars in Dayton and Detroit. Replacement parts will be made in the New Castle (Ind.) plant when the expected possession of it is acquired, but the original Maxwell plant in Tarrytown, N. Y., will be discontinued, as was already known would be the case. It has remained idle ever since the failure of the United States Motor Co. in September last.

Jones and Precision End Litigation.

Although when the Jones Taximeter Co., of New York City, filed a suit in the Supreme Court for New York county in October last against the Precision Tool & Instrument Co., also of New York City, it claimed all attempts at arbitrating the dispute in question had failed, some sort of arbitration finally appears to have been effected, for the action has been discontinued. The Jones company alleged that the Precision company agreed to build 3,000 Jones speedometers and that the transaction resulted in a financial difference of $7,503.33 in favor of Jones, which account was disputed and baffled all attempts at peaceable settlement.

OAKLAND SUED BY SHEPHERD AND SHEPHERD COMPANY, TOO

Former New York Dealer Claims Damages Through Business Dealings—Agency Head Claims Injuries from Flywheel.

Not only has Irving R. Shepherd, the president of the Shepherd Motor Car Co., of New York City, sued the Oakland Motor Car Co., of Pontiac, Mich., for which the Shepherd company once was dealer, but last week the Shepherd company brought a suit of its own in the Supreme Court for New York county against the Oakland company; while Shepherd's personal suit is for injuries caused when an Oakland flywheel burst, the company's suit is the result of disagreements which arose between the manufacturer and the dealer.

The Shepherd company, when it signed up as Oakland dealer about three years ago, was not situated on Broadway, the main thoroughfare in the metropolitan automobile colony, but shortly after the contract was executed the Shepherds moved to Broadway, and state that this was at the request, or insistance, of the Oakland company. The dealership did not progress smoothly, and July 31, 1911, relations were ended. The Shepherds claimed that they had not been treated properly and were entitled to certain money from the Pontiac concern. It was not forthcoming, even after long negotiations, and the suit resulted.

Irving R. Shepherd's action is for $15,000, and to secure jurisdiction over the Michigan corporation the Oakland exhibit at the New York show in Madison Square Garden was attached by the sheriff of New York county, but since this was a mere formality toward securing authority of the court over the Oakland people, the attachment was subsequently released.

Shepherd states that the Oakland flywheel in question was one of a series which were improperly constructed, having three fan-blade spokes instead of a web between the rim and the hub and having holes bored in the rim, all of which, he claims, made the part a dangerous piece of property. He was testing a carburetter March 21, 1910, when the flywheel blew up and he sustained severe injuries, including one of the head which, he claims, was more than temporary. The Shepherd company, in which Irving and a brother are prime movers, recently took over the Selden agency in New York.

Motor Shaft Moves and Changes Name.

Having practically completed its removal from Hastings, Mich., to Jackson, in the same State, the Hastings Motor Shaft Co. has changed its name to the Jackson Motor Shaft Co. At the same time it has elected officers as follows: President, Winthrop Withington; vice-president, F. L. Holmes; secretary, A. E. Mulholland; treasurer, John L. Allen. These officers and L. C. Bloomfield, Fred H. Lewis, H. A. Tompkins, John F. Goodyear and W. W. Potter constitute the board of directors.

Providence Engineering Resumes Business.

One of the several affiliated companies which were brought down by the failure of the United States Motor Co. in September last, the Providence Engineering Co., of Providence, R. I., has straightened out its affairs and secured the discharge of the receiver and restored the property to the stockholders. It is stated that the debt of the United States Motor Co., which caused the engineering company's failure, has been liquidated and that the Engineering company last week repurchased its entire capital stock from the reorganizers of the United States corporation. Business has been resumed with Richard A. Robertson of Providence as president. The other directors of the company are as follows: F. J. Kingsbury, Norman Leeds and James Coulter of Bridgeport, Conn.; V. Everit Macey, William H. Erhart, F. J. Lisman, Richard Irwin and F. Kingsbury Curtis of New York, and Randolph T. Ode of Providence.

Knox to Go Through Bankruptcy.

As the best means of bringing about desired reorganization, the Knox Automobile Co. of Springfield, Mass., which on September 27 last made an assignment, was thrown into bankruptcy last week on the petition of three minor creditors—the Hartford Auto Parts Co., whose claim amounts to $757.35; Samuel Eastman, $38.50, and the Platinide Co., $2.66, the total for all three being but $778.51.

The petition was filed in the Federal court in Boston, which appointed as receivers Harry G. Fisk and Edward O. Sutton, to whom the September assignment was made, and Charles C. Lewis. Negotiations are in progress with New York capitalists who, it is expected, will bring more than sufficient money into the Knox company to put it solidly on its feet, at which time probably it will be renamed Knox Motor Car Co. Meanwhile the factory is operating without interruption.

Michigan Magneto Ceases to Spark.

C. C. Simons has been appointed receiver for the Michigan Magneto Co. of Detroit, Mich., which, however, at no time, cut much of a figure in the trade. Its liabilities are $31,050.26 and its assets $28,415.85. Poor business is given as a reason for the failure of the company.

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The Week's Incorporations

Los Angeles, Cal.—Tallyho Garage, under California laws; authorized capital, $50,000; to operate a garage.

Cadillac, Mich.—Wexford-Cadillac Auto Co., under Michigan laws; authorized capital, $20,000; to deal in motor cars.

Quarryville, Pa.—Fairmount Automobile Co., under Pennsylvania laws; authorized capital, $6,000; to deal in motor cars.

Kalamazoo, Mich.—Fuller & Sons Mfg. Co., under Michigan laws; authorized capital, $100,000; to manufacture motor cars.

South Bend, Ind.—South Bend Auto Body Co., under Indiana laws; authorized capital, $20,000; to manufacture motor car bodies.

Pittsburgh, Pa.—Keystone Motor Supply Co., under Pennsylvania laws, authorized capital, $12,000; to deal in motor car supplies.

Rumford, Me.—Rumford Garage, under Maine laws; authorized capital, $50,000; to operate a garage. Corporators—G. W. Pettengill, H. A. Briggs.

Germantown, Pa.—Staybestos Mfg. Co., under Pennsylvania laws; authorized capital, $10,000; to manufactuer brake lining and other asbestos products

Detroit, Mich. — Automobile Laundry, under Michigan laws; authorized capital, $10,000. Corporators—T. I. McCutcheon, H. T. Nelson, F. D. McCormack.

Cleveland, Ohio—Coronet Mfg. Co., under Ohio laws; authorized capital, $60,000; to manufacture speedometers. Corporators—Harry W. Garberson and others.

Boston, Mass.—Donovan Motor Car Co., under Massachusetts laws; authorized capital, $50,000; to deal in motor cars. Corporators—J. S. Donovan, A. D. Adams.

Easton, Pa.—Lafayette Motor Car Co., under Pennsylvania laws; authorized capital, $30,000; to deal in motor cars. Corporators—Robert Fulton and others.

El Reno, Okla.—Martin Motor Co., under Oklahoma laws; authorized capital, $20,000; to deal in motor cars. Corporators—R. D. Martin, W. H. Townsend, F. S. Randall.

Newark, N. J.—J. H. C. Motor Express Co., under New Jersey laws; authorized capital, $25,000; to operate a motor delivery. Corporators—J. B. Furber and others.

Wilmington, Del.—Pullman Taxicab Co., under Delaware laws; authorized capital, $100,000 to deal in motor cars. Corporators—E. C. Boyd, P. L. Garrett, W. A. Joslyn.

Camden, N. J.—Invader Oil Co., under New Jersey laws; authorized capital, $250,000; to manufacture lubricants. Corporators—F. S. Saurman, F. A. Kuntz, F. S. Muzzey.

Chicago, Ill.—Comstock Auto Sales Co., under Illinois laws; authorized capital, $3,000; to deal in motor cars. Corporators—J. D. Comstock, O. M. Nichols, R. W. Gardner.

East Orange, N. J.—Rickey Machine Co., under New Jersey laws; authorized capital, $125,000; to operate a motor car repair shop. Corporators—M. H. Rickey and others.

Chicago, Ill.—Cutting Motor Co., under Illinois laws; authorized capital, $5,000; to deal in motor cars. Corporators—Nelson W. Mackey, John P. Klein, Eugene C. Mapledoram.

Detroit, Mich.—National Gear Co., under Michigan laws; authorized capital, $1,000; to manufacture motor car parts. Corporators—Thomas J. Hoyt, G. H. Klein, Ralph B. Lacey.

Camden, N. J.—United States Tire Filler Co., under New Jersey laws; authorized capital, $125,000; to manufacture tire filler. Corporators—R. B. Patton, H. E. Patton, H. R. Gorman.

Madison, Wis.—Madison Gasolene Engine Co., under Wisconsin laws; authorized capital, $15,000; to manufacture motors. Corporators—W. C. Bently, J. W. Proctor, A. O. Ledford.

Tulsa, Okla.—Tulsa Spring Wheel Co., under Oklahoma laws; authorized capital, $50,000; to manufacture wheels. Corporators—J. B. Dix Dunlap; Peter R. Deickman W. T. Smith.

Cleveland, Ohio—Universal Accessories Co., under Ohio laws; authorized capital, $5,000; to manufacture motor car accessories. Corporators—Carl Epero, T. W. Rutledge, R. E. Vernes.

Stockton, Cal.—Gill Novelty Co., under California laws; authorized capital, $50,000; to manufacture motor car devices. Corporators—T. J. Gill, W A. Murphy, R. J. Prout, C. M. Gill, J. C. Skinner.

St. Louis, Mo.—Patterson-Abrams Automobile Co., under Missouri laws; authorized capital, $2,000; to deal in motor cars. Corporators—William L. Patterson, Robert Abrams, Wayne J. Stedelin.

Somerville, Mass.—Atlantic Motor & Supply Co., under Massachusetts laws; authorized capital, $25,000; to deal in motor cars and supplies. Corporators—A. G. Sleeper, F. A. Sleeper, H. B. Clements.

New Haven, Conn.—Motor Truck Sales Co., under Connecticut laws; authorized capital, $1,800; to deal in motor trucks. Corporators—J. F. Denison, F. J. Mansfield, W. F. Mansfield, H. W. Beach.

Logansport, Ind.—Logan Auto Supply Co., under Indiana laws; authorized capital, $25,000; to deal in motor car supplies. Corporators—Charles D. Billman, Charles D. Pettigrew, Ollie A. Cummins.

Minonk, Mo.—Minonk Central Garage Co., under Missouri laws; authorized capital, $10,000; to operate a garage. Corporators—George Kramer, D. J. Kerrigan, H. M. Harms, M. A. Petri, Frank Cronin.

Cleveland, Ohio—Ohio Auto Carriage Co., under Ohio laws; authorized capital, $10,000; to deal in motor cars. Corporators—Alfred A. Benesch, Ralph Goldsworthy, F. A. Federman, Reuben Shapiro, E. M. Chaloupka.

South Orange, N. J.—Landstra Portable Automobile Turn Table Co., under New Jersey laws; authorized capital, $150,000; to manufacture motor car devices. Corporators—Dirk S. Landstra, Edward D. Ely, Fred C. Schlather.

New York, N. Y.—S. J. Wise & Co., Inc., under New York laws; authorized capital, $20,000; to deal in motor cars. Corporators—C. E. Van Vleck, Jr., Short Hills, N. J.; E. M. Dalley, Larchmont, N. Y.; C. M. Kohn, 251 West 95th street.

New York, N. Y.—Webster-MacGowan, Inc., under New York laws; authorized capital, $50,000; to deal in motor cars. Corporators—George P. McGowan, William H. Webster, 136 West 52nd street; G. Monroe Dyer, 49 Wall street.

New York, N. Y.—Packard Lyric Renting Car Co., Inc.; under New York laws; authorized capital, $1,000; to rent motor cars. Corporators—John Collins, Mary Collins, 1491 Broadway; William P. Schmuck, 137 Milton street, Brooklyn.

Brooklyn, N. Y.—Jack Rabbitt Auto Co., Inc., under New York laws; authorized capital, $500; to deal in motor cars. Corporators—Frank Dunn, 11 Folsom Place;

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Donato Cella, 3001 Atlantic avenue; Philip Roth, 3358 Fulton street.

Niagara Falls, N. Y.—Power City Auto Co., under New York laws; authorized capital, $5,000; to deal in motor cars. Corporators—Eugene A. Kinsey, La Salle, N. Y.; James M. Donohue and Augustus G. Porter, both of Niagara Falls.

Queensboro, N. Y.—Elite Auto Wagon Co., under New York laws; authorized capital, $5,000; to deal in motor vehicles. Corporators—Samuel A. Hartogensis, 50 West 77th street; Leo Loeb, 424 East 50th street; Ralph S. Hartogensis, 4 West 105th street.

New York, N. Y.—Pneumatic Hub Wheel Co., under New York laws; authorized capital, $10,000; to manufacture wheels. Corporators—Kasiel Blau, 120 Delancy street; George Dorfman, 220 Hopkins street; Walter Primoff, 993 St. Marks avenue, Brooklyn.

New York, N. Y.—Shepherd Auto Co., under New York laws; authorized capital, $5,000 to deal in motor cars. Corporators—Irving R. Shepherd, Fannie E. Shepherd, 106 Pennsylvania avenue, Brooklyn Joseph A. Shepherd, 1095 Boulevard E, West Hoboken, N. J.

New York, N. Y.—Gildale Motor Corp., under New York laws; authorized capital, $30,000; to deal in motor cars. Corporators—Fred W. Strauch, 270 East 161st street; Theodore P. Gilman, Jr., Mount Vernon, N. Y.; Edward S. Peck, White Plains, N. Y.

New York, N. Y.—Duplex Gasolene Motor Co., Inc., under New York laws; authorized capital, $200,000; to manufacture gasolene motors. Corporators—George W. Woodruff, 1 Broadway; A. Parker Nevin, 30 Church street; Thomas U. Parker, Long Acre Building.

New York, N. Y.—Delivery Supervision Co., Inc., under New York laws; authorized capital, $1,000,000; to manufacture and deal in speed indicators. Corporators—Kenneth Groesbeck, 257 Fifth avenue Eben Luther, 2nd, 1269 Broadway; Hillman B. Hunnewell, White Plains.

New York, N. Y.—Bell & Waring Steam Vehicle Co., under New York laws; authorized capital, $25,000; to deal in motor vehicles. Corporators—Harry G. Waring, 4 Amackassin Terrace, Yonkers, N. Y.; Harvey W. Bell, 301 Palisade avenue, Yonkers; Howard G. Phillips, 220 West 98th street.

Los Angeles, Cal.—Western Automobile Association, under California laws; to control automobile contests in California. Corporators—Frank A. Garbutt, Frank W. Young, E. Y. Boothe, E. E. Hewlett, W. J. Lacasse, L. T. Shettler, W. E. Bush, John S. Mitchell, R. A. Rowan, William M. Garland.

PROMINENT MEN IN TRADE WHO ASSUME NEW DUTIES

Resignations and Promotions That Serve To Place Many Workers In New Places—Few Leave the Industry.

Fred E. Erickson has been promoted to the post of superintendent of the Universal Motor Truck Co. of Detroit. He succeeds E. W. Bodson.

C. Robert Hoyme has been appointed manager of the Alco branch in Philadelphia. Previously he was identified with the International Motor branch in the same city.

Henry Goodman, former sales manager of the Grinnell Electric Car Co. of Detroit, has joined the Buffalo Electric Vehicle Co. He will be a member of its traveling staff.

Frank J. Sheen has been promoted to the post of purchasing agent for the Abbott Motor Co., Detroit. Previously he was in charge of the stock and tracing departments of that company.

George H. Bryant, advertising manager of the Franklin Automobile Co. of Syracuse, N. Y., has resigned that position. He will join the advertising staff of the Locomobile Co., in Bridgeport, Conn.

Russell F. Hoborn has been appointed manager of the McGraw Tire & Rubber Co.'s New York branch at 1706 Broadway. Previously and for many years he was identified with the Voorhees Rubber Co. of Jersey City.

J. T. Adams, sales manager of the Adams Bros. Co. of Findlay, O., maker of the Adams truck, has resigned that office. He has been succeeded by L. J. Adams, secretary of the company, who will perform the duties of both positions.

William D. Kelley, assistant superintendent of the Oakland Motor Car Co., has been promoted to the superintendency of the plant. He succeeds S. H. Humphries, who was transferred to Pontiac when the Elmore plant of the General Motors Co. was discontinued last fall.

Henry T. Myers has been appointed manager of the Studebaker Corporation's New England branch and will, of course, make his headquarters in Boston. Previously he had charge of the Studebaker branch in South Bend, Ind., but in addition he has served as a confidential representative of the big corporation and has spent several months in its foreign department.

R. E. Shadel has been appointed district sales manager of the Kline Motor Car Corporation for New York and the New England States, with the exception of Connecticut. He will make his headquarters in Rochester, N. Y. The vacancy in the management of the Kline branch in York, Pa., caused by Shadel's promotion, has been filled by the appointment of Thomas Bornesson.

Fred E. Dayton, sales manager of the Columbia Motor Car Co., one of the units of the late United States Motor Co., has resigned that position to become general manager of the National Incinerator Co., the headquarters of which are in New York but which will erect shops in several other parts of the country. Dayton had been in the Columbia service since 1903, when that car was built by the Electric Vehicle Co., and followed its fortunes as manager, successively, of the Hartford, Boston and Chicago branches.

Top Makers Fall Apart and Sue.

Walter S. Smith and William A. Apple, who organized an automobile top making company in Dayton, O., have fallen apart and Smith has applied to the courts asking that the company be dissolved. Apple, it appears, furnished the money and Smith the experience, but apparently Smith believes that he did not get all that was coming to him, as in his complaint he alleges that on one contract for 5,000 Ford tops a profit of about $5,000 was made, one-half of which, he says, belongs to him. He asks the court to rule on that point and also to direct Apple to render an accounting for all funds since September 15th last.

Collecting an Old Stein Account.

One of the accounts of the Stein Tire & Rubber Co., which concern withdrew from the automobile trade in New York City several weeks ago, has been placed in the form of a judgment in the New York county clerk's office, the move being but one of a number which is being made to clean up the affairs of the tire house; this judgment is for $146.57 and is against Eva Grossman and Alice Foster, of Freeport, L. I., it being stated that they are the responsible parties in the Freeport Tire Co., although the active parties in the business are, it is stated, not the women.

Findlay Motor Becomes but a Memory.

The last has been heard of the Findlay Motor Co., of Findlay, O., which was organized by L. E. Ewing and which set out to do large things but which failed before doing any of them. It failed on September 19, 1911, but only last week was sold by the receiver to J. G. Cleary, of Milwaukee, for $50,000, the upset price named by the court. Cleary will dismantle the plant and remove the machinery to Milwaukee, where it will be used for purposes other than automobile manufacture.

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In the RETAIL WORLD

A garage is being erected in Chico, Cal., for C. C. Brown.

Weed & McLaughlin have opened a new garage in Veazie, Me.

Alvah Weed and George McLaughlin plan to establish a repair business in Bangor, Me.

Ralph Catlin has purchased the garage of F. Hawley, in Montrose, Pa. Catlin will operate it.

J. L. Hannegan of Clayton, Wis., has sold his garage business to his partner, W. A. Lawson.

John Bendle of Protection, Kan., has sold a half interest in his garage business to W. F. Brewer.

M. H. Davis, of Lynn, Mass., plans to open a garage and machine shop in Westboro, in the same State.

Gunther & Knittle, of Catawissa, Pa., have had plans prepared for a new garage; the firm handles the Ford.

W. C. Morris, formerly of Weston, Mich., has opened a garage and machine shop in Olivet, in the same State.

August Holterman has been admitted to partnership in the De Pere (Wis.) Motor Car Co. by Joseph Hallett.

H. W. Dimmitt of Wymore, Neb., has sold his garage business to A. J. Hubbell of Beatrice, in the same State.

Samuel Dey of Englishtown, N. J., has purchased a site in North Cranbury, in the same State, and will erect a garage.

The B. M. Byrne Garage Co., of Grand Rapids, Mich., has changed its name to Central Automobile & Supply Co.

R. B. Wiar, formerly of Coin, Ia., has leased the Farragut Garage, in Shenandoah, in the same State and will operate it.

The Lincoln Motor Sales Co. has opened offices in Los Angeles at 1217 South Flower street; Lincoln half-ton trucks are stocked.

M. T. Kennett of Covington, Ky., is about to establish a garage and repair shop in Cincinnati, O. It will be located on Reading road.

Lanzford, Bacon & Myers have entered the trade in San Francisco; they will distribute Lauth-Juergens trucks on the Pacific Coast.

The H. W. Newman Machine Co., of Davenport, Ia., has let the contract for a two-story brick garage; it will be located on 3rd street.

L. W. Spencer has established an accessory store in Council Bluffs, Ia., at 301 West Broadway; the style is Spencer Auto Supply House.

E. J. Gilmer and S. J. Webster have entered the trade in Toledo, O., at 127 Erie street; they represent a line of quick tire repair material.

August A. Jonas, of Milwaukee, Wis., has had plans drawn for a garage, to be located on Prospect avenue; it will accommodate 150 cars.

A two-story garage with an 80-foot front is to be erected in Brooklyn, N. Y., on St. Mark's avenue, for the occupancy of the Rudd Taxicab Co.

George F. Gillson has let the contract for the erection of a garage in the Whistler Subdivision, in Los Angeles; the cost is estimated at $9,340.

Frank Banks, S. V. Saxby and Dr. G. N. Butchart, of Hibbing, Minn., have purchased the F. M. Smith Co.'s garage; they will continue the business.

A garage, 100 x 120 feet, is to be erected in Los Angeles at 310-16 Boyd street; when completed it will be occupied by the Los Angeles Auto & Taxicab Livery.

Mahlon S. Drake of Newark, N. J., has secured plans for a garage, 59 x 100 feet, which he will have erected on William street; the estimated cost is $15,000.

B. F. Dixon and Judson Thomas of Washington, Ia., have dissolved partnership; Dixon will continue the automobile business which the copartnership conducted.

M. T. Kennett, owner of the Kentucky Motor Sales Co., has let the contract for the construction of a garage, in Cincinnati, O., on Reading road; it will be 100 x 75 feet.

City Garage is the style of a business which is about to be established in Long Beach, Cal., at 212 Locust street; a building which is now being erected will cost $17,000.

H. L. Kimmel and G. Brodt have opened a repair and machine shop in Los Angeles at 1230 South Figueroa street; they formerly were connected with the American agency.

R. H. McKenzie of Walla Walla, Wash., has purchased the Waitsburg (Wash.) Garage of S. H. Champ & Son; H. M. Champ, the son, has taken a position with the Holt Mfg. Co.

M. H. Lawler and F. L. Poor are about to enter the trade in Brockton, Ill., under the style Lawler & Poor; they will handle Ford and Studebaker cars and conduct a repair business.

The Shawnee Motor Car Co., of Topeka, Kan., has been taken over by the West Motor Car Co. The latter will continue the business at the former location, 928 Kansas avenue.

Borstner & Scott, operators of the Holly (Col.) Garage, have sold out to Heckethorn & Brown, of Lamar in the same State; the new style will be Heckethorn & Brown Automobile Co.

The Franklin Automobile Co.'s branch in Cleveland, O., has been discontinued; hereafter the company's business in that territory will be handled by the C. H. Eckenroth Sales Co.

Automobile Tire & Tube Hospital is the style of a business which has been established in Cincinnati, O., at 907 Race street; W. M. Galt is "head physician" and H. V. Hague "chief interne."

Thomas W. Bunnell, Cutting dealer in Toledo, O., and Charles A. Newman, Cole and Little dealer, have consolidated under the style Bunnell Auto Sales Co. Salesrooms have been secured at 1416 Madison avenue.

Monnich & Monnich, dealers in Sioux City, Ia., have dissolved partnership; John Monnich will open a similar business in Fremont, in the same State, and Bernard Monnich will operate the Hooper Garage, in Sioux City.

Edward S. Clark, who has been associated with his father, Edred Clark, in the Paige-Detroit agency in Hartford, Conn., has taken over his father's share of the business; he will conduct it hereafter at 183 Allyn street.

The garage firm of Kerrigan & Dickman, of Minok, Ill., has been dissolved, Dickman retiring; replacing it there has been formed a corporation consisting of D. J. Kerrigan, H. M. Harms, Michael Petri, Frank Cronin and George Kramer.

Paterson, N. J., is about to have a new

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garageman; Frank A. Pawleski, a licensing agent of the Motor Vehicle Department of that State, is arranging to open up at Paterson and Governor streets.

The Western Auto Supply Co., located in Omaha, Neb., at 20th and Farnam streets, has been sold by George and Harold Pritchett to Edward Pegau and Herbert Kohn; the new owners formerly were employes of the Pritchett brothers.

John R. Oakes, formerly of Lexington, Ky., has entered the trade in Galesburg, Ill., at 240 East Simmons street, under the style Cadillac Automobile Co. of Galesburg. The business is subsidiary to the Cadillac Automobile Co. of Peoria.

The Keeton Motor Co. of New England has been formed in Boston to distribute the car of that name in New England territory; the organizer of the business is W. B. Doan, who was manager of the Oldsmobile branch in Detroit from 1908 to 1911.

The Des Moines (Ia.) Auto Supply Co., recently organized, has taken quarters at 1007 Locust street; A. G. Bigelow is president and B. O. M. Bonebrake secretary and treasurer. The company will take advantage of the Parcel Post and make a specialty of mail order business.

David S. Hendrick, a dealer in Washington, D. C., has incorporated under the style David S. Hendrick Co., Inc.; Hendrick is president and general manager, S. G. Kirtland, secretary and treasurer, and A. L. Middlekauff, assistant to Kirtland. Franklin cars are handled.

The Gauntlett Auto Sales Co. has been incorporated with a capital of $50,000 and is about to enter the trade in Southern Michigan and Northwestern Ohio; Buick cars and G M C trucks will be handled, with Toledo as headquarters and a branch in Milan, Mich. E. D. Gauntlett of Milan, who operates department stores in that town and Manchester, Mich., and who has banking and manufacturing interests, is the head of the new company.

Cox Also Defeats Neverout Patent.

In line with the decision of Judge Cross in the Federal court in New Jersey, in which the same patent but different defendants were involved, Judge Hazel, in the United States District Court in Buffalo, N. Y., last week dismissed the suit of the Rose Mfg. Co. of Philadelphia, Pa., against the Cox Brass Mfg. Co. of Albany, N. Y., for alleged infringement of the so-called Neverout lamp bracket patent, No. 883,973. Although employing less vigorous language than did Judge Cross, and stating that he had arrived at his conclusion before Judge Cross's decision had been called to his notice, Judge Hazel declared that "although the patentee seems to have been the first to employ a combination of lamp bracket and number plate as an automobile accessory, still it is doubtful whether such combination required the exercise of inventive faculty, in view of the use to which lamps and lamp brackets" previously have been put in illuminating other articles.

Franklin Companies Re-elect Franklin.

Almost as a matter of course, H. H. Franklin was re-elected president of both the H. H. Franklin Mfg. Co. and the Franklin Automobile Co. at their annual meetings, which occurred in Syracuse last week. The other officers chosen are as follows: For the H. H. Franklin Mfg. Co—John Wilkinson, vice-president; Frank A. Barton, secretary and treasurer. These officers and Giles H. Stilwell, Edward H. Dann, A. T. Brown and W. C. Lipe constitute the board of directors. For the Franklin Automobile Co. — Giles H. Stilwell, vice-president; Frank A. Barton, secretary and treasurer. In addition to these officers, John Wilkinson and Edward H. Dann were elected directors. The only change effected by the election was an interchange of vice-presidencies by Wilkinson and Stilwell; Wilkinson, who formerly was vice-president of the automobile company, was made vice-president of the manufacturing company, since he recently has assumed the position of manager of the plant. Stilwell's change was vice versa.

Grabowsky Assets Sold by Receiver.

At the receiver's sale of the Grabowsky Power Wagon Co. in Detroit on the 22nd inst., the factory building was sold to the E. G. Budd Mfg. Co., the Philadelphia steel body builders, who paid $110,000 for the property. The machinery also was disposed of in parcels to various patrons, the Grabowsky patterns, jigs, dies, tools and part of the machinery being purchased by the Seitz Automobile & Transmission Co. of Wyandotte, Mich. The Seitz company, it is said, will continue the manufacture of the Grabowsky trucks at Wyandotte, and for the time being, at least, under the direction of George A. Horner, who managed the Grabowsky plant after it was taken over by the creditors' committee which unsuccessfully endeavored to avert bankruptcy.

Krit and Baron Settle Differences.

The suit brought by the Krit Motor Car Co. against Ferdinand Van der Noot de Moorsel, a Belgian nobleman, and Philip Breitmeyer, of Detroit, was settled out of court last week. The terms of settlement were not made public. The Krit company sued to recover $1,000 on a bond signed by Breitmeyer when the Belgian was appointed to represent the Krit company abroad. It alleges it delivered to de Moorsel two cars for exhibition purposes and that he converted them to his personal use and otherwise did not live up to his bond. The foreign nobleman maintains that he sold 48 cars but that the company ignored his order, while Breitmeyer claims that the contract was amended after he gave bond and that the amendment released him from further obligation. When the Krit action first was filed, the baron retorted with a suit for $10,000.

I. H. C. Wagon Goes to New Company.

The $140,000,000 International Harvester Co. which, among other things, makes the I. H. C. motor wagon, is about to transfer all of its foreign business and certain of its American plants to the International Harvester Corporation, which has been organized for the purpose under the laws of New Jersey with an authorized capital of $70,000,000. The capital is made up of $30,000,000 7 per cent. preferred stock and $40,000,000 common.

The stockholders in the old company will be permitted to exchange half their holdings for an equal amount of stock in the new company. The plants which have been transferred to the latter are those in Akron, Milwaukee, Newark Valley, N. Y., and two other plants in Chicago, the transfer carrying with it the big corporation's automobile interests.

Recent Losses by Fire.

Blunt, S. D.—Blunt Auto Co., garage destroyed. Loss not given.

Charter Oak, Ia.—E. T. Malone, garage destroyed. Loss not given.

Appleton, Wis.—Calumet Auto Co., garage and cars damaged. Loss, $2,500.

Sioux City, Ia.—H. A. Wetmore, 517 6th street, garage destroyed. Loss not given.

Davenport, Ia.—Raymond E. Hosler, 518 East High street, garage destroyed. Loss not given.

Garagemen Neglected Their Oil Bill.

Suit has been brought in the Supreme Court for New York county by the Standard Oil Co. of New York against George C. Hyde and R. Burchard Hultz, who operate a garage at Port Washington, L. I., under the style Hyde & Hultz; the claim is that between May 9 and November 14, 1912, the two men bought oil to the value of $515.35 and failed to pay for it.

Seattle Branch for Kelly Trucks.

The Kelly-Springfield Motor Truck Co. has opened a branch in Seattle, Wash., at 511-13 East Pike street. It is in charge of Henry Schmidt, who has been identified with the Packard agency in Seattle for several years.

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GASOLENE'S COST AND ITS EFFECTS.

In artfully seeking to defend the 90 per cent. increase in the price of gasolene which has been brought about in the United States in about a twelvemonth, those who point out that abroad 30 cents or 40 cents per gallon is the prevailing rate, overlook that the effect is exactly what may be expected to arise from such a cause: i. e., that while the automobile industry of the United States has grown by leaps and bounds to enormous proportions the high price of gasolene on the other side of the "pond" is one of the reasons why the foreign industry has remained practically at a standstill.

The number of cars and trucks in use in New York State alone about equals the number of such vehicles in use in all of Great Britain, and the number in use in Pennsylvania or Ohio, for instance, or any other two fairly populous States, about equals, if it does not exceed, the total number of four-wheeled motor vehicles in use on the Continent.

It is a pretty contention that Americans will purchase automobiles in undiminished numbers whatever may be the price of fuel, but the contention is prettier than it is sound. It is reasonably certain that they will do no such thing, or if so, they will incline to the purchase of small cars rather than large ones, or even the moderately large ones, which now are numerously available at fairly popular prices. This is a thought which American car manufacturers well may keep in mind.

When the fuel cost alone of operating a truck figures out at five or six or seven cents a mile, or more, it is certain that possible truck purchasers will stop long to count the cost, and it is equally fair to assume that a very considerable number of intending car buyers will do likewise, even though the fuel cost per mile may average but one-half of those sums.

As Motor World several times has remarked, the one fact which stands out above all others is that regardless of whether the supply of gasolene exceeds the demand or the demand exceeds the supply, and regardless of any other conditions which may obtain, the profits of the Standard Oil Company remain undiminished. On a capitalization which is so prodigious as to be almost unhealthy, the profits of the grasping corporation are of the same unhealthy proportions. Usually anything that legitimately affects either supply or demand, or both, is reflected in the earnings of the interests represented. Apparently, however, nothing affects Standard Oil. It applies thumbscrews whenever desire for more money possesses it.

"INTERLOCKING" GARAGEMEN AND OWNERS.

The unfortunate plight, due to the practices of its chief promoter, in which the most recent of the many so-called "national associations" which seek to interlock the interests of the garage keeper and the car owner, finds itself, serves to call renewed attention to the persistency with which that will-o'-the-wisp has been pursued in so many directions.

Many shrewd or over-shrewd men, seeking only their personal profit, have found the use of such terms as "association," "league" or "society," an attractive means of adding to their incomes, but somehow their efforts to dovetail the interests of the garage keeper and the car owner have met with a lack of success which is not short of remarkable.

In theory, such projects contain all the elements of "easy money"; nothing appears simpler or more enticing than a proposal to bring patrons to a garage by holding out to the patrons promises of special rates or special services of some sort. On the surface, such an arrangement seems so advantageous to both of the interests involved that the bringing together does not suggest great difficulties, but that the difficulties are very much greater than theory leads to believe is evidenced by the long succession of failures which have overtaken such highly colored enterprises.

Always it has seemed that the sponsors of such undertakings, masked as a "national association," would encounter no great trouble in finding a sufficient number of garagemen and car owners willing to part with good money for apparent benefits, usually pictured by skillful use of language which, however, promises little or nothing that is definite. It is to the credit of both the garage keeper and the car owner that they refuse to succumb to such blandishments. Generally speaking, the comparatively few who have done so have obtained for their money little more than a gilt-edged certificate, which constitutes an interesting souvenir of theory gone wrong, if it stands for nothing more—or less.

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ENGLAND'S IMPORTS EXCEED EXPORTS BY $14,000,000

Both Increased During the Year 1912 But Previous Conditions Remain Unchanged—Import of Parts Attains Great Strength.

During the year 1912, Great Britain's exports of cars and parts totalled £3,681,824, as against £3,186,238 during the previous twelvemonth. Of the total, £1,220,294 is represented by parts and the remainder by the value of 5,282 complete cars and 1,179 chassis; in 1911, there were exported 4,536 cars and 735 chassis. During the year the average value of cars exported fell from £397 to £383.

The imports into Great Britain during 1912 far exceeded the exports, totalling £6,381,448, as compared with £5,312,773 during the previous year. Of the total, £3,185,227, or almost exactly 50 per cent., is represented by parts. The total number of cars imported was 6,276 and the number of chassis 6,890, the average value of the complete cars being £326, as against £247 during the previous year. The chassis averaged £278, as compared with £253 during 1911.

Kalamazoo Fullers Adopt Family Name.

Fuller & Sons Mfg. Co. has succeeded the Michigan Automobile Co., Ltd., of Kalamazoo, Mich., the change being one of name only. Frank D. Fuller is president and general manager of the company, which is capitalized at $100,000, his elder son, L. C., being secretary and treasurer and the younger one, W. P., manager of sales. W. E. Upjohn is vice-president. The change of name is due to the fact that the manufacture of automobiles was discontinued several years ago, and also because the Michigan Motor Car Co., makers of the Mighty Michigan, have since attained prominence in the field. Fuller & Sons will continue to devote themselves to the manufacture of parts, chiefly transmission elements.

Nichols Takes on Velvet Absorbers.

J. C. Nichols, Inc., of 1671 Broadway, New York, has acquired the Eastern sales agency for the Velvet shock absorber made by the John W. Blackledge Mfg. Co. of Chicago. Nichols will handle the shock absorber in connection with the Schebler carburetter and his other accounts.

Johnson Brothers to Produce Engines.

The three Johnson brothers of Terre Haute, Ind., who have been building motor boat engines on a small scale, have found the necessary capital and organized the Johnson Bros. Motor Co., which has been incorporated with an authorized capital of $70,000. The Commercial Club of Terre Haute has found adequate shops for the new company, which immediately will enlarge its scope to include the production of automobile engines. Among those interested in the enterprise are Demas Deming, a Terre Haute banker, and Charles Minshall, a Terre Haute and Chicago capitalist.

Buffalo Kissel and Oil Company at Odds.

Were the Buffalo (N. Y.) Kissel Kar Co. not entitled to a credit of 90 cents on the books of the Indian Refining Co., of New York City, the amount for which the latter is suing the former in the Supreme Court for New York county would be $124.55; as it is the 90 cents is deducted in the demand for a settlement. The Indian company claims the amount is due for its products supplied to the Buffalo concern between August 16 and November 8, 1912.

Endorsement Brings Woe to Wyckoff.

Because Clarence F. Wyckoff endorsed three three-months notes given by the late Wyckoff, Church & Partridge, of New York City, early in 1912 and late in 1911, he has been made the debtor in a judgment for $1,160.09 filed last week in the New York county clerk's office by the Diamond Rubber Co. of New York; the dates and faces of the notes were: December 11, 1911, $312.41; January 10, 1912, $379.80; February 10, 1912, $381.64.

Dissatisfied Purchaser Attaches Packer.

Because a Packers truck was not according to the specifications named in the contract of sale, as the Colonial Mantel & Refrigerator Co., of New York City, claims, the latter this week brought suit in the Supreme Court for New York county against the Packers Motor Truck Co., of Wheeling, W. Va. The amount asked is $3,043, and as a preliminary move the complainant asked and was granted an attachment against the defendant's property.

Rayfield in Metropolitan Branch.

The Findeisen & Kropf Mfg. Co., maker of the Rayfield carburetter, has established a sales and service branch in New York at 1902 Broadway, which premises previously were occupied by the Warner Instrument Co. Experts direct from the Rayfield factory will render the service.

Dealer and Supply Firm in Court.

Judgment for $31.87 was entered last week in the New York county clerk's office against Cryder & Co., automobile dealers, of 583 Park avenue, New York City, by the General Automobile Supply Co., of 1671 Broadway; the amount represents an unpaid bill for supplies.



February 1-8, Chicago, Ill.—National Association of Automobile Manufacturers' 12th annual show in the Coliseum and 1st Regiment Armory. Pleasure cars only.

February 3-8, Washington, D. C.—Washington Automobile Show Co.'s exhibit in Convention Hall.

February 8-15, St. John, N. B.—First annual show of the New Brunswick Automobile Association in the Drill Hall.

February 8-15, Youngstown, Ohio—Annual show of the Youngstown Automobile Show Co. in the Auditorium and Annex.

February 8-15, Hartford, Conn.—Sixth annual show of the Hartford Automobile Dealers' Association in the State Armory.

February 10-15, Minneapolis, Minn.—Minneapolis Automobile Show Co.'s show in the National Guard Armory.

February 10-15, Chicago, Ill.—National Association of Automobile Manufacturers' 12th annual show in the Coliseum and 1st Regiment Armory. Commercial vehicles only.

February 12-15, Geneva, N. Y.—Annual show in the State Armory, under the auspices of the Ottawa Valley Motor Car Association.

February 15-22, Albany, N. Y.—Annual show of the Albany Automobile Dealers' Association in the State Armory.

February 15-22, Newark, N. J.—New Jersey Exhibition Co.'s Sixth annual exhibit in the First Regiment Armory.

February 16-23, Richmond, Va.—Richmond Automobile Dealers' Shows Co.'s exhibit in the Horse Show building.

February 17-27, Kansas City, Mo.—Kansas City Automobile Dealers' Association's show in Convention Hall. First week pleasure cars; second week commercial vehicles.

February 19-22, Davenport, Ia.—Annual show of the Tri-City Automobile Dealers' Association in the Coliseum.

February 19-22, Oshkosh, Wis.—Oshkosh Automobile Dealers' Association's second annual show in Armory B.

February 20-22, Canandaigua, N. Y.—Motor Car show in Hawley's Garage, under the management of A. Blumenstein.

March 8-15, Boston, Mass.—Boston Automobile Dealers' Association's annual show in Mechanics' Hall. Pleasure cars only.

March 19-25, Boston, Mass.—Boston Commercial Vehicle Association's annual show in Mechanics' Hall.

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MUCH THAT IS NEW REVEALED IN DETROIT'S OWN SHOW

Two Cars and Two Carburetters, One With Throttle in Unusual Place—Annex Required to House Exhibits.

The Hub of the Automobile Universe—that is to say, Detroit—was set whirling on its anti-friction bearings on Monday evening, the 27th, when the 12th show of the D. A. D. A., otherwise the Detroit Automobile Dealers' Association, was opened with every exhibit in place and every bit of work completed on the really splendid decorations.

Wayne Garden, the exact center of the hub for the time being, was entirely too cramped for the 72 exhibitors—44 of cars and 28 of accessories—and it became necessary to build an annex to provide the additional space required. The energy required to spin the Hub on its bearings was directed by President Neumann and Manager Wilmot of the D. A. D. A., and though their "overtime" will not come to an end until the show closes on Saturday night, the way in which they and their associates put their shoulders to the wheel has called for comments of the blush-producing kind. It may be that it is not necessary to add that the show is by all odds the best that the Automobile Hub yet has swung; the statement is made, anyway, and there's no such thing as contradicting it.

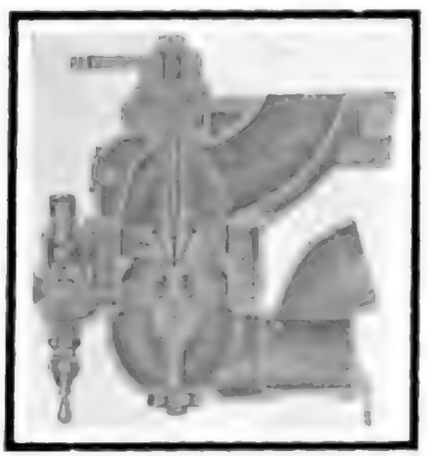
Decorations of "Worth While" Type.

As for the decorations, on which the D. A. D. A. has spent $6,000 coin of the realm, it would be proper to say that they are simple and effective—they are—if these terms were not so worn that they seem to have lost their real significance. Under the circumstances it is necessary to go further, and say that they are a good deal more than good. They have been made to suit the place. While cold statements give little of warm realities, it will help the imagination to set forth that the ceiling is tinted to give the effect of sky, in which countless purple lights simulate twinkling stars; apart from these, the lights are concealed and the illumination is softly diffused. Landscapes decorate the walls, helping out the sky effect. There are no divisions between the exhibits, so that there is no obstruction to the eye, and the whole sweep can be taken in at a glance. The decorative scheme, which is the work of J. L. Hall, is fittingly characterized as "something worth while."

As a matter of course, many of the special exhibits are those which were shown in New York. The Cadillac electrically operated chassis, the Hudson cutaway chassis, the Briggs-Detroiter ivory-and-gold touring car, the complete Studebaker line, the exhibits of the Chevrolet, Cartercar, Lozier and most of the others are simply transplanted. But, on the other hand, there are not a few exhibits that New York did not see. The Ford, the Century, Detroit, and Grinnell electrics, the Traveler, the Warren and the Star did not appear in New York.

Star and Traveler Make Debut.

Of these the Star is a brand new machine, built by the Star Motor Car Co., of Ann Arbor, Mich., which was incorporated under Maine laws last fall with a capitalization of $500,000 and took over the assets of the Huron River Mfg. Co., and of which Gottlieb Luick is president. The product is a line of commercial vehicles—light trucks and delivery wagons—of 1,500 pounds and



CARBOMETER IN SECTION

1 ton capacity, built throughout of standard parts, with four-cylinder motors, shaft drive to gearset, built as a unit with the jackshaft, and final drive by side chains. The Traveler also is a new machine, and stands in the limelight because of the fact that it is to be sold direct to the public by its manufacturers, the Traveler Motor Car Co., of Detroit, of which J. P. Lavigne is president.

The Traveler is a touring car of a popular type, having a 36-horsepower motor, unit power plant style, driving through disk clutch, selective sliding gears and bevels to the full-floating rear axle. The wheelbase is 120 inches; the tires are 34 x 4 inches. As befits a modern machine, the regular equipment is complete, including a Gray & Davis electric lighting system, among other things.

The Detroit electric "clear vision" brougham, upholstered in yellow, is a real attraction for the fair sex—and in this day of widely disseminated knowledge who shall say that the upholstery is the cause of its popularity? The Warren people, for the first time, exhibit a seven-passenger "six" and a "six" chassis, as well as their older four-cylinder touring car.

The accessory exhibits, though more than a third of the total number, occupy a small amount of space; nevertheless, there are several decidedly interesting new things shown that did not adorn the New York show lists. Chief of these is the Carbo-Meter, which is a carburetter of novel construction representing three years' study and work by William Shakespeare, Jr., the Kalamazoo (Mich.) manufacturer of "Honor Built" fishing tackle and other sporting goods.

Shakespeare's Radical Carburetter.

As the accompanying illustration shows, the most striking feature of the instrument is the fact that the throttle is placed on the intake side of the mixing chamber, which is just the opposite to the usual position between the mixing chamber and the outlet to the manifold. Moreover, the form of the throttle and its functions are radically different from the more familiar butterfly devices commonly employed. In fact, the throttle is the whole carburetter, to use a common expression. The float is in a comparatively small annular chamber around the middle of the body, and the spray nozzle is in the center of the space surrounded by the float chamber. A small annular air passage is formed around the spray nozzle. The throttle consists of a disk large enough to close the main air passage completely when seated; its movement is up and down. There is a central hollow boss in the lower part of the disk which slides over the ports which admit air from the main air passage to the small auxiliary passage. The central air opening contracts sharply, causing the small air current to converge upon the gasolene outlet, and above the nozzle the opening expands, funnel-like, open into the main air passage, or the mixing chamber, as it is at this point. There is a central stem from the throttle rising through the top of the carburetter where it carries the operating lever, and in the center of the stem, projecting downward into the spray nozzle, is a needle valve, with a very long and extremely fine taper.

Obviously the needle moves with the throttle. Therefore, when the throttle is raised the main air passage is opened, as also is the small central air duct, and at the same time the needle-valve rises in the nozzle and permits a larger quantity of spray to be drawn out; incidentally, the spray is forced to assume a funnel shape, mixes with the small air current and this, in turn, meets and mixes with the main air supply in the mixing chamber. The arrangement is clearly shown in the accompanying illustration.

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though it is somewhat difficult to describe clearly.

Other features of the Shakespeare instrument include a hot air intake provided with a dash-operated regulating device which allows close regulation of the temperature of the air current as a whole. It will be observed that there is but one moving part, the throttle, and no springs, no auxiliary air inlets and no adjustments beyond those for the needle valve, which is permanent, once set, and the temperature regulator, which affects temperature only.

The fact that it makes easy the elimination of back-lash from the primary operating device lends no small interest to the Boyer steering gear, made by the Boyer-Miller Co., Detroit, which is shown very clearly in the accompanying illustration. The central feature of the gear, and the only one that is not immediately apparent, is that the two parts of the nut can be rotated with relation to each other when the central sleeve, which normally clamps them together as one, is loosened by turning a pinching screw. Thus one section can be moved away from the other a distance equal to the amount of wear on the threads, and in this way all wear can be taken up and the gear will work without lost motion in the screw until the threads are absolutely worn out.

Novel Self-adjusting Carburetter.

Another novelty in gas-supplying devices is the Krause self-adjusting carburetter, made by the Krause Mfg. Co., of Detroit. The interesting feature is the manner in which the air passage is controlled automatically. There is a set of three flat metal rings with central openings of varying diameters, the largest at the bottom and the smallest at the top, and a central ring which has a sleeve that goes around the spray nozzle, leaving only a small annual passage. The rings are lifted by the vacuum when the engine is turning over, and the stronger the vacuum the more rings are lifted and floated, and the larger the quantity of air admitted. There are no springs, and the only adjustments are made by means of the main air valve at the bottom and the ordinary float valve.

The Automobile Equipment Co., of Detroit, shows a neat little device for heating the gasolene in the bowl of the carburetter, and so facilitating starting. The device takes the form of a plug which is screwed into the carburetter in place of the drain cock; there are two terminals for the connecting wires—from a 6-volt battery—and there is practically nothing to get out of order. Before starting the motor the current is switched on, heating the gasolene in the bowl and causing it to vaporize rapidly.

The booming industry of stealing automobiles has resulted in the bringing out of many kinds of thief-proof devices, the latest being that of E. H. Bryant, of Cleveland. It consists of a lever-locking arrangement in the form of a pair of wedges which, when the gear-shifting lever is in neutral position, slide down and fill the space in the slot, so the lever cannot be moved from neutral until the Yale lock is unlocked. The Bryant lock fits any of the standard gear-shifting levers and weighs one pound.

Claim Advantages for Plate Radiator.

Another new creation is shown by the Farlinger Mfg. Co., of Detroit—the Fa-vose plate radiator, which is of plate construc-



BOYER STEERING GEAR

tion, and is said to be much lighter, as well as exposing greater surface to the air than other radiators. Even in the large sizes it is said there are not more than 30 pieces of metal, all told. The car exhibitors follow:

Abbott Motor Co., Abbott-Detroit; Annett Auto Garage, Auburn; Artemas Ward, King; Baker Electric Co., Baker Electric; Barber Motor Sales Co., Detroiter; Bemb-Robinson Co., Hudson; Buick Motor Co., Buick; Cadillac Motor Car Co., Cadillac; Cartercar Co., Cartercar; Century Electric Sales Co., Century Electric; Chevrolet-Little Co., Chevrolet and Little; Church-Field Co., Church-Field Electric; Cleveland-Galion Motor Truck Co., Cleveland-Galion trucks; Cunningham Auto Co., Flanders, Maxwell; Detroit Electric Garage, Detroit Electric; Detroit Hupmobile Sales Co., Hupmobile; Ford Motor Co., Ford; Foster Motor Sales Co., Cutting; General Motors Truck Co., G. M. C. trucks; Grant Bros. Auto Co., Lozier; Grinnell Electric Car Co., Grinnell Electric; Havers Motor Car Co., Havers; J. P. Schneider, Locomobile, Stevens-Duryea; Keeton Motor Co., Keeton; Krit Motor Car Co., Krit; M. A. Young, Mitchell and Reo; Neumann-Lane Co., Chalmers, Pierce-Arrow and Rauch & Lang Electric; Oakland Motor Car Co., Oakland; Overland Motor Sales Co., Overland; Postal-Fair Motor Co., Michigan, Peerless; P. W. Schulte, Paterson; R. C. H. Corp., R. C. H. and Hupp-Yeats Electric; Regal Motor Sales Co., Regal; Seidler Sales Co., Jackson; Siegel-Zeckendorf Co., Cole; Standard Auto Co., Packard; Studebaker Corp., Studebaker; Thompson Auto Co., Alco, Federal and Standard trucks; Traveler Motor Car Co., Traveler-Detroit; Warren Motor Car Co., Warren; Winton Motor Car Co., Winton; W. J. Marshall Auto Co., Paige; Star Motor Car Co., Star.

Seeks to Prevent Testing on Highway.

If the bill introduced into the State legislature by Representative S. J. Miller, of Marion county, Indiana, is enacted as a law, it will become illegal for a manufacturer, or any other person, to use a public highway for the purpose of testing out his vehicle. The bill, which is aimed at the Indianapolis manufacturers, provides a fine of not less than $50 nor more than $200 for each offense. The word "testing" is defined as meaning "the driving of an automobile or motorcycle before it has been fully assembled and equipped with its final accessories, for the purpose of ascertaining necessary adjustments of machinery defects in material or workmanship."

Ohioans Evolve a Rust-Proof Paint.

Rust on tire rims, bolts and rings is troublesome in more ways than one: it is destructive to both the rubber and the fabric of tires, and if allowed to form to any great extent it causes things to stick in a most troublesome way. To eliminate such difficulty, a rust-proofing paint, one application of which will prevent corrosion for a season, has been evolved by the Anti-Rust Paint Co., of Akron, O., and now is being offered to the trade; its efficiency lies in its ability to stick to the metal surfaces and to resist the inroads of moisture. A little unexpected trouble with a rusted "quick" detachable rim is sufficient to indicate the value of an efficient paint of this character.

Get Two Car Thieves in Los Angeles.

The mystery of the disappearance in Los Angeles of 31 cars, valued at $45,000, within the last few months has been cleared by the arrest in a junk shop of two young men—George Nelson, 17, and Edward Frame, 18, both former garage employes. They said it was their plan to watch until a car was left at the curb, when one of them would jump to the wheel while the other cranked up; then both dashed away to a deserted section and stripped off tires and other easily saleable parts. They received 8 cents a pound for shoes and 15 cents for tubes. The police believe the arrests will lead to the apprehension of a ring of automobile thieves.

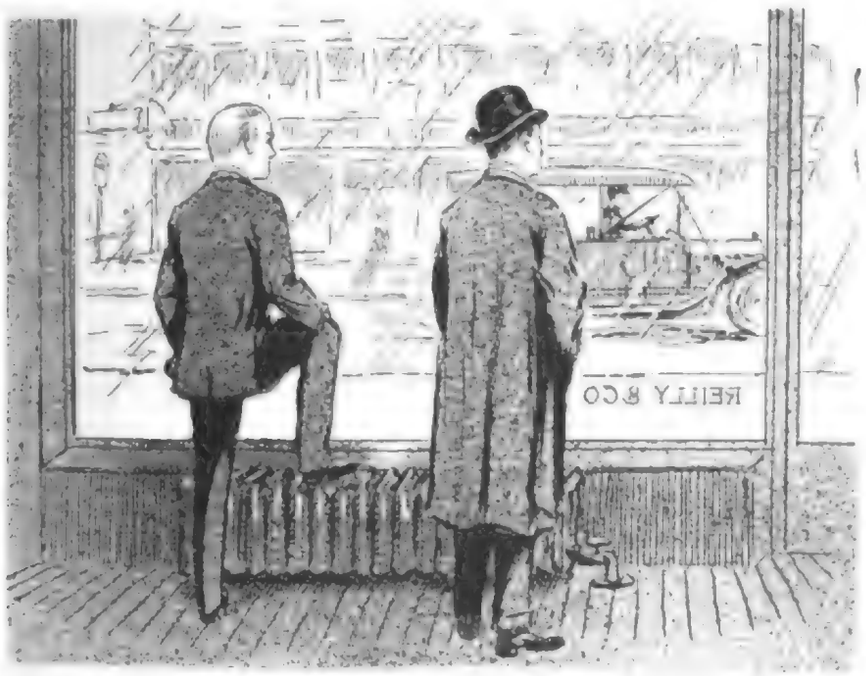
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REILLY BENEFITTED BY RIVAL'S EXAGGERATION

Salesman of Competing Line Loses Sale by Over-Painting the Merits of His Car—Reilly Obtains the Order and Shows Sales Manager Wherein There Is Strength in Apparent Weakness.

"There goes a chap who did me a good turn the other day," remarked Reilly, who stood at the front of the showroom, his foot upon the squatty steam radiator, as he pointed to a passing car of a rival make with a fur-coated driver at the wheel.

"Who is he?" asked the Sales Manager, bringing back to earth his gaze, which had been directed upward at the fascinating



"THERE GOES A CHAP WHO DID ME A GOOD TURN," REMARKED REILLY

spectacle of a multitude of fluffy snowflakes which were floating slowly and gracefully to the street.

"That's Brust, the Prince dealer; what did he do for me? Oh, he sold a car for me," casually rejoined Reilly, in answer to the Sales Manager's question.

How Another Dealer Helped Reilly.

"Sold a car for you? Since when did he become a philanthropist?"

"Since he started in as a dealer," replied Reilly with a quizzical smile. "That was about—let's see—six or eight months ago. As to his being a philanthropist, he may be, but he doesn't know it. I would be the real philanthropist if I explained to him why he is one."

"When you get through talking in circles perhaps you'll say something that mean- something," testily retorted the Sales Manager.

"Just to accommodate you I'll present the story in Kindergarten form," came back the dealer. "Brust helped me sell a car by making a hum job when he had a chance to make a sale, and the customer came to me; I sold him a car but by not doing what Brust did."

"You can't keep from going around in your conversation, can you? You're just like a dog that's getting ready to lie down," said the Sales Manager disgustedly.

"Well, if you'll subside for a minute, I'll sift it into your skull. Brust has a good car, but he didn't know how to make the prospect believe it; instead of winning over the would-be buyer, Brust antagonized him by telling him things the man was sure couldn't be true. And once the prospect felt that Brust was exaggerating on one point he naturally believed there was exaggeration on all points, so he didn't buy."

"What, for instance?" asked the Sales Manager.

"Well, for one thing, Brust told him the car used less gasolene than any other car on the market. The car isn't extravagant in its consumption of fuel, neither is it a world-beater for economy; but to say it absolutely used less gas than any other car, would go further on a gallon than any other car made, and thereby would make a substantial reduction in the owner's operating expense is some statement. The Prince car is a good car all right and gives reasonable service, but Brust couldn't back up his statements.

Exaggerator Who Didn't Make Good.

"The prospect, whose name is Robertson, was a bit skeptical, but thought that if there were any truth in the statement it was worth investigating, at least. He asked Brust why it was so economical. Brust said that, for one thing, the motor was smaller and yet was large enough for all practical purposes. That much is true, to a certain extent, but Robertson, who, like most owners, knows a thing or two about cars, named several other makes and asked Brust if the motors were not about the same size. Brust didn't really know, but when Robertson began to tell the different bores and strokes, Brust had to give up the size argument.

"Then he grabbed at the carburetter as the next thing, but while he showed some difference he couldn't demonstrate anything at all remarkable. Then he began to talk about the radiator, and Robertson wanted to know what the radiator had to do with it. Brust brought up other points, but a well-informed man like Robertson realized at once that the claim of economy was based chiefly on 'bunk,' at least so far as Brust could tell."

"But how did that help you?" interrupted the Sales Manager.

Prejudice Aroused Against the Car.

"Wait, wait! I'll get to that in a minute," admonished Reilly. "As I was about to tell you, Robertson and Brust went over other points of the car, but when Brust did hit what really was an excellent selling point Robertson's mind was in anything but a receptive condition. Robertson had become prejudiced because he thought Brust was trying to tell him a lot of stuff that wasn't true; and so he was. Brust didn't set out to lie about the car, but he repeated a lot of those old and exaggerated statements that have been used in various forms ever since Jacob and Esau drove that disastrous bar-

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gain in the birthright-mess-of-oatmeal deal.

"Robertson didn't buy. But he wanted a car, and I got in touch with him; how I reached him is another story, but when I started to tell him about our car he became interested. He wanted to know if it was not the most economical car on the market in the way of fuel. I told him as I tell everyone, when that question comes up, that it was not. He asked questions, and I told him some things that I wouldn't have told had he not asked. The substance of my story was that, while there were cars which would use less gasolene, they were invariably cars of less power and that for this size of car our car was not surpassed, and that, while it was not so exceptional in use of gasolene, it had features which are not found in other cars."

"Do you always admit a weakness, or lack of superiority?" questioned the Sales Manager.

Admission of Weakness May Convince.

"That often is an assertion of strength, more convincing than any other statement a salesman can make," replied Reilly. "Of course, it depends on whom you are talking to. I saw at once that Robertson knows all about cars, and I decided to tell him things he could see for himself were reasonably true. This so-called admission of weakness won his confidence and he believed I was telling the truth, which gave me an opportunity to lay effective emphasis upon our real selling points. Our price is neither the highest nor the lowest, and the car is neither the worst nor the best, but I succeeded in convincing him that it would give satisfaction and was about the best car he could get for the price."

"Don't you ever exaggerate?" asked the listener, in a tone which indicated that salesmen who do not do so are scarce.

Automobile Buyers Are Well Informed.

"Not very much and not very often," asserted Reilly. "Exaggeration is not the way to make sales, at least not with the intelligent class of people who are buying automobiles. A man who is out to buy a car generally knows something about cars in general before he starts. He knows his friends get 10 or 12 miles a gallon out of their gasolene and that sometimes they get a little more, so when you tell him your car will average 18 or 20 miles you've got to have some real reason to back it up or he won't believe it; generally he won't believe it anyway. Your car looks like the average car, the motor is much the same, with a radiator, carburetter and all the other parts, and why it should use so much less gas than any other car is a bit mystifying to the man who knows automobiles.

"The same exaggerated statements are made in connection with cars in many ways. How often do you hear the statement, 'Best in the world,' 'Absolutely the easiest riding,' 'Most economical in tires,' 'Uses least oil,' and a long list just like that. Such stuff has become so common that putting it in written or spoken sales talk is only wasted time. If there were but one man who claimed his car to be the 'best in the world' it might mean something, but when they all claim it no one pays any attention to it. The average man passes up this kind of talk and wants facts.

Claims Proper if They Are Supported.

"Claims of superiority are proper if there are any grounds for them. Supposing car has proved that it is easy on tires or rides easy; if there is any reason for it there is some likelihood that a man will believe it. Also, if a salesman can give what appears to be a bona fide, intelligent argument as to why his motor is economical in gasolene consumption he stands a good chance of being believed."

"'Intelligent' is good," added the Sales Manager; "one of the finest specimens of intelligence I have run across in some time was displayed by a truck salesman a few days ago. I was asking him about his truck, and he said one of its selling features was its 'assessability.' 'Assessability?' I asked, 'what's that? Do you mean that it is such a good and valuable piece of work that the city can assess it for a high price and thereby prove its value?'

"'No, no,' he replied; 'how long have you been in the business? I mean assessable—easy to get at.' I said, 'You mean accessible, don't you?' 'No, I don't,' he retorted, 'I mean just what I said—assessable; who's selling these trucks, you or me?'"

"Exhilarators" and "Accelerators."

"Also," continued Reilly, "did you ever notice how many people demonstrate their knowledge by talking about 'exhilarators'? More than half the chauffeurs use it; in fact, the men in my shop, I found, were using it almost entirely, and to get to them all at the same time, I posted a notice in the shop explaining that the little lever that, when depressed, makes the car jump ahead is the accelerator—'ak-sell-er-a-tor,' and not 'ex-il-er-a-tor.' Exhilarator may express in a general way what causes the feeling of the owner when he pushes the accelerator, but the engineers never intended the name to be used in connection with the device.

"Many salesmen and a big per cent. of owners mix up these terms. If you don't believe it just keep your ears open and see how the words are pronounced. A salesman who isn't any better informed than that is quite likely to make an unfavorable impression on a prospect, provided the prospect knows the difference. Ignorance of little things, such as pronunciation, and exaggeration are in about the same class; either may prejudice a prospect."

Just then a little girl, whose appearance signified little to the Sales Manager, approached the door. But Reilly recognized her at once.

"Here's another of those kids after money for the fair," he said, and when she entered he automatically handed out ten cents. As she left, Reilly added, "There's been a million of them here this week."

"Let's see," computed the Sales Manager, slowly, "a million at ten cents each is $100,000. Must have made a big hole in this week's profits, didn't it?"

"Who said anything about one hundred thousand dollars?" retorted Reilly.

"You did," replied the Sales Manager, "and speaking of exaggeration——"

Used Car Sale Leads to $40,000 Offer.

If every dealer could transact business as has E. A. Brandes, of Hastings, Neb., the used car problem would vanish like the Cheshire car of Wonderland; there would be nothing left of it but a grin. Brandes may have lost money on trading cars, but at present he is so far ahead that he can afford to allow unheard-of prices for some time to come and still be money ahead.

It all came through a real estate deal. One day last fall a farmer from Adams county strolled in and made known the fact that he had a hankering for some kind of a car; Brandes had a used car he was anxious to get rid of, and the farmer had an 80-acre farm 200 miles south of Kansas City, in Oklahoma, that he didn't care whether he kept or not. The farm wasn't much of an enjoyment, and a car would be. The result was that he traded his "eighty" for the used car.

Brandes forgot all about his farm; he thought that so long as it was real estate it would stay there until he went to see it, so he kept at business and the farm had almost slipped from his mind until a few days ago, when it bobbed up with tremendous force—the force being imparted by an offer by wire from an oil company of $34,000 for the property. He thought the telegraph operator must have made a mistake and that the figure should have been $340, and since he did not want to sell for this price he wired a refusal. Two days later came an offer of $36,000, and that aroused his suspicions. He turned the offer down and decided to investigate. He learned then that oil had been discovered on adjacent property. The latest offer was $40,000, with Brandes sitting tight waiting for further developments. At least, such is the story as it comes from Nebraska.

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GARAGEMEN UNCOVER THREE ROUTES TO CHEAPER "GAS"

Dinner of New York Association Evolves Varying Propositions—Two Refining Processes and One Utopian Scheme.

Even if the New York Garage Association is seeking some relief from the excessively high price of gasolene, it hardly expected, when it arranged the dinner which occurred Tuesday evening last, 28th inst., that the occasion would bring to light three suggested solutions of the problem, the sponsors of each method being emphatically sure their way is the way to lower prices and bring prosperity. There was some expectation that one proposition, of which the association knew previously, might be indorsed that evening, but in the deluge of propositions nothing has yet been done.

Proposition No. 1 is the one which had been investigated, and on the face of affairs seems the best of the trio; it is advanced by the Hydrocarbon Products Co., of New York City, which claims to have been making and marketing petroleum products for four years in a small way and at about half the cost of the methods used by the big oil companies.

Proposition No. 2 was hardly a proposition, but a statement by William R. Gulick of Jersey City, N. J., who is associated with Harris Hammond of New York City, eldest son of John Hays Hammond, the "Copper King," to the effect that he had evolved a process whereby crude oil with slight refinements could be used as fuel in an automobile motor.

Proposition No. 3 was a mysterious unknown commodity which appeared in the person of S. J. Frank, a New York attorney, and Thomas H. Cochrane, of Allenhurst, N. J., who essayed the role of a political economist and press agent for Attorney Frank. The latter, by the way, has had his picture taken "upon orders of his publicity man," but "he won't let it go out unless he has to." Cochrane permitted a Motor World man to obtain a good look at the photo. Frank, while his "booster" was explaining about the picture, dropped the remark, "Blank is my photographer," and shoved his hands deeper into his trousers pockets.

Frank and Cochrane passed around agreements which many of the garagemen signed; the paper stated that those who signed would assemble to discuss a definite plan for the lowering of the cost of living, in this instance the item of interest being gasolene. Frank's press agent stated that the former has a definite plan for lowering practically all prices throughout the country, that all trades, both employers and employed, along with housewives and numerous other persons and classes, were being interested in the movement, and that chambers of commerce and boards of trade in many cities were allying themselves with the promoters. It was specifically stated that there are "no officers, no dues, no fees."

Frank's weapon in his movement, while not yet disclosed, is both legislative and judicial, and he claims wonderful results will be obtained if the people at large back him up. His press agent stated that Frank is a constitutional lawyer of great ability and able to swing the pendulum of success in the right direction. Details of the scheme were not forthcoming beyond that a meeting is to be held in New York in about two weeks.

Those who submitted proposition No. 2—the hydrocarbon project—were more explicit. Robert Baker, a former Congressman, is head of the company, and he and E. W. Mitchell, another officer, told of the company's work. The business was started commercially four years ago under what is known as the Turner process, which was patented as late as December 10 last under the number 1,046,683, and has been conducted on a small scale in Brooklyn. The process consists of a quick refining of crude oil, even of a very poor grade, with a resultant series of products the cost of which is about half that of the products of the refineries owned by the big oil companies, the time required being but 40 seconds.

One product, of course, is gasolene, and the men from the company stated that it had been tried out in numerous demonstrations and found to be the equal of the present commercial commodity; the promoters desire the garage association to contract for a large supply, in which case manufacture will be commenced on a larger scale and the son of a New York brewer, it is said, will immediately put $200,000 into the business. All that is wanted is an assured market for the first of the increased output. The garagemen are seriously considering the matter. A refinery in New Jersey is planned, and for the time being $100 stock is being offered at a $20 rate.

Gulick's statements were to the effect that he has been operating cars for seven years on what is almost crude oil and that much is to be expected from contemplated carburetter improvements; he and Baker disagreed in their prognostications in that while Gulick said he did not believe "gas" ever would be lower but would be higher, Baker declared the price of the commodity was bound to fall. He said that what made his company a dangerous competitor of the big companies was that the man who controls the invention has refused all offers from the big oil companies and desires to operate for himself. Gulick and his associates are now securing certain patents, and later in the winter, he states, they will be able to make public their plans and processes.

The Turner process, as described in the patent, comprises coils and drums with an apparatus for mixing steam and oil vapor and parts so constructed that distillation may be conducted continuously and economically.

The garage association's dinner, which was served in the Wurzburger Hofbrauhaus, on Broadway, between West 83d and 84th streets, was well attended, and those who founded the organization last fall for the general betterment of the trade expressed gratification; several prominent men in and variously connected with the trade addressed the gathering, but all else was overtopped by the discussion of the gasolene situation.

Poetry that Tells Garage's Merits.

Garages and poetry are supposed to be so foreign to each other that few men have had the courage to attempt coupling them. D. L. Ormsby, president of the Hill Top Garage at 451 West 151st street, New York, however, has donned the red badge of courage and is employing poetry to call attention to the merits of his establishment. It is printed on a blotter, which he has distributed among the car owners in his part of the big city, and that the Ormsby jingle is not half-bad and tells the whole story of the advantages of the Hill Top institution is evidenced by the "poem" itself, as follows:

Our telephone is 3-6-9
With Audubon attached,
For help in an emergency
Our service can't be matched.
Remember, it's the Hill Top,"
The name of our garage;
There's not a post from wall to wall,
Although the place is large.
Our washers and our polishers—
In fact, "Hill Top's" whole crew—
They turn a car out for your use
That can't be told from new.
No soap is used to dim your paint,
Our service is polite;
The crew is on the job all hours
Throughout the day and night.
We've "free cold air" you're welcome to,
Accessories galore,
And all at moderate prices, too—
One could not wish for more.
A specially equipped big car
To tow or to repair
Awaits at moment's notice
Your call to anywhere.
If for a place to keep your car
You've not yet made selection,
Just call on us—it is not far—
We ask your close inspection.
A modern place, right up to date,
Roomy, clean and large,
At honest, although moderate, rate;
That's us—"Hill Top Garage."

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WIDE-AWAKE MERCHANDISING In the Motor Trade

SHORTCOMINGS OF SALESMEN

Revelations of the New York Show That Emphasize the Necessity for Being Posted—"Greenhorns" Expensive.

At the New York show there was ample evidence that the fundamental principle of salesmanship—know your goods—had been overlooked in the mental equipment of many of the men on the job.

"Yes, this car is built throughout of chrome nickel steel," said the young man in attendance at one booth where a car priced 'way up in the thousands was being exhibited. "We use nothing but the very finest materials."

"Is this made of chrome nickel steel?" asked the prospect, pointing to one of the pistons that lay on a table.

"Yes, sir; three and one-half per cent. nickel steel is used in that piston, the same as in the rest of the car."

The catalog stated that it was made of the "best grade of pure gray iron."

Harmfulness of Ignorance Apparent.

In another booth a similar lack of definite knowledge was discovered. The man in charge was explaining that the rear axle was equipped with a certain make of bearings when, as a matter of fact, an entirely different type of bearings were being used. Further, when asked where the bearings were located he did not know. When the visitor suggested that a recent advertisement had specified an entirely different bearing he became very much confused and had to resort to the catalog, where he was much chagrined to find that the visitor was correct.

These are but two from a multitude of examples which might be cited to prove that in spite of the wider familiarity with details of automobile construction on the part of the public generally, there is still a very great deal to be done towards the education of so-called salesmen before they are really fit to come into contact with the car-wise public.

Salesman the Point of Contact.

It is the old, old story of the inverted pyramid. The factory spends thousands of dollars advertising the machine, pays transportation of men to and from New York, pays big hotel and expense bills, pays for space at the exhibition hall, likewise thousands of dollars for exhibits that will not stand out, but the whole thing goes to smash when the first prospect arrives and finds that the so-called salesman—the vital point of the contact—does not know what he is selling. As Motor World editorially remarked more than a month ago, an automobile show calls for the best trained and most capable men in the sales organization. It is an expensive place in which to break in "greenhorns."

GARAGE FACILITIES THAT COST LITTLE AND COUNT HEAVILY.

A garage with proper toilet facilities—a garage with warm water at the faucet, with plenty of clean towels to dry hands with, a whisk broom to brush off clothes made dusty by contact with the car, a mirror in which to see that one's hat has not a dent in it, a cloth that he can beg, buy or steal to wipe the oil off his hands—these facilities make a wonderful hit with customers.

No matter how much his car is looked after, there is sure to be some little thing the owner wants to do himself, and it is almost as certain that his hands or his clothes will be soiled in doing it. True, he may have a pair of old gloves to protect his hands, but again he may not, and isn't it true also that the investment required for the several items enumerated is not large, and can you not imagine the merchandising appeal of such necessary conveniences?

The fine art of looking after customers has here a chance for expression at the expenditure of a moderate sum, all of which would come back fourfold. Most any garage could afford it—and make it pay.

VARYING THE MONOTONY OF WINDOW DISPLAYS.

"Position is everything," said someone a long time ago. It is not known what was referred to and it does not very much matter. The saying has been passed along for what it is worth. In the matter of window displays it may be worth very much or very little. It is all according to how one makes it count.

Automobile advertising formerly looked very much the same because every manufacturer used to show a straight side view of his car. In forty advertisements the position of the car always was the same. Then somebody awakened to the fact that if he placed his car differently it would have an attention-value quite distinct from the others. Three-quarter views, head-on views, pictures of life in them, cars amid handsome surroundings became the order of the day. The monotonous sameness disappeared.

The same sense—the sense of sight—is appealed to in window displays. This suggests the desirability and commercial profitableness of frequent changes of position of cars shown. Cars that are always in the same position in the same window, amid the surroundings, become dead and uninteresting to the passers-by. Change the position and there is immediately a new attention-value. Cultivate the habit of shifting the view. If possible, vary the colors of the models shown, vary the models, change the lighting—do anything and everything that will make a pronounced change, keeping always within the limits of good taste and good judgment. If your competitor shows his car in one position, display your cars from another angle. It is worth while. And that is the one big reason for window displays of any kind.

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AWAKE-NDISING WORLD

TAKING STOCK OF MIND HABITS

How the Practice May Prove Helpful in Eradicating Dead Notions—Livening "Dull Months" That Do Not Exist.

Habits of mind are very much like habits of the body. They can be acquired without our knowledge. They can be changed and rooted out with intelligent study and persistent effort. They are sometimes good; often bad. Periodical taking stock of them is quite likely to prove beneficial; certainly it can do no harm.

Periodically, men take inventories of stock; they count up their bank balances and check off their sales; then why not count up and check off habits of mind. Possibly there may be found some that might just as well be changed.

Effect of a Change of Mind.

One of the habits of mind that many merchants have acquired is the thought that certain months are necessarily quiet and dull. This is particularly true of automobile dealers. The dull months are taken for granted. And, of course, they are dull—likely to be very dull, too. The thing to do is to get down to bed rock and find out by study of the facts if there is any real reason for the dullness more potent than the habit of mind which has been passed on to someone else. If the facts reveal any business possibilities at all, then it is time for a change of mind.

Certain localities take on colors and shades of thought without knowing how they come about. Everybody lays down. Then somebody who is not tinged by the thought comes along and "cleans up" and everyone wakes to the fact there was much business to be had all the time, only nobody was honestly working hard to get it. Millions of dollars are lost every year to merchants simply because they don't take the "blinders" off their minds and get busy.

"How do you pay your salesmen in winter, during the quiet months?" recently was asked E. W. Steinhart, president of the Cadillac Automobile Co. of Indiana. "We pay them the same in the winter months as any other time," he replied, "and they have got to deliver sales just the same. When men are real salesmen, the fact that there is snow on the ground makes no difference. Our monthly quota stands just the same and our men make good; if they don't they get off the job."

There was nothing more to be said. Salesmen are quite likely to take their attitude of mind from the boss. Therefore, it behooves the boss to take very careful stock of his habits of bind and to eradicate dead notions.

THE VETERAN SALESMAN AND THE WORD "SALESMANSHIP."

So much has been written about salesmanship that is not salesmanship at all that some of the veterans on the firing line are apt to despise everything that creeps into print about their profession. Indeed, some go so far as to loathe the word salesmanship. To them it seems to savor of quackery. Therefore they resolutely shut their eyes and their minds to much that might be of practical use.

"Why, I've been selling goods for years and I stand first in volume of sales for our force; I tell you there is no set of rules that will build a salesman. To my mind adaptability is the great thing," said one of these veterans. "But the greatest thing of all is to know your goods from A to Z, forward and backward, and to believe in them not merely because you know them, but in spite of it."

How Culture Helps Salesmanship.

And this veteran of a thousand fights shrugged his shoulders as he thought once more of the word salesmanship that he does not like. Yet, when one got close to him he found that he was just as receptive as a boy. He turned over the pages of James Lane Allen's "As a Man Thinketh," dug into a few paragraphs, took out his pencil and jotted down the name of the little book and remarked that it was just the kind of stuff he believed in. Then he commenced to recite Kipling's "If." He realized that anything that would help to build his character made him a better salesman. He knew the salesman's need of a stiff backbone and he knew that one way he could acquire reserve force was by making himself master of the thoughts of other men. He had been enriching his mind in just that way for years, and it had all helped to make him the powerful, confident, efficient, high-grade salesman that he is. All of which gives fresh point to the familiar saying, "A rose fresh point to the old familiar saying, "A rose by any other name would smell as sweet."

PROSPECTS PERMITTED TO PASS.

"The man who was not a prospect yesterday is a prospect to-day." This has been a saying in the automobile trade for some time, and in it is a large measure of truth. The neighbor who was not thought to possess sufficient means to own and operate an automobile suddenly drives home one night in his new car. The grocer, the florist, the butcher, who were reckoned out of the automobile purchasing class, go flying past on Sunday in their new cars.

Then is realized the truth of the old saying that a man never knows what he can do until he tries; and it is seen how utterly impossible it is to judge of the financial ability of one's neighbors. Then it is decided never again to rate anybody as beneath the salesmen's attention and some of the people whom it had been decided to forget are left on the list of prospects. The thought occurs that, instead of narrowing down our list of prospects, it is much better to build it up and to proceed on that

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Solutions of The Used Car Problem, in Competition for Motor World's Cash Premiums of $50, $25, $15 and $10 for the Best Four Articles Dealing With the Subject.

By F. A. CORNELL, Toledo, Ohio.

Handling the "used car problem" is largely a matter of organization. Any properly directed business is accounted for by methods that indicate clearly the costs, receipts and profits of each of the several departments. The personal stimulus provided by allowing department managers to share in any increase of net profits, from work done under their direction, is now generally regarded as the best scheme for getting maximum results.

The really good man appreciates his own worth and has a distinct idea of proper personal earnings. If he does not profit in reasonable proportion to the volume of business he handles, he sooner or later makes a change.

As the "used car problem" confronts the automobile dealer he should look around for just such a self-sufficient, capable and energetic trader, who may be in his own organization in a minor capacity. If not, go out after the proper person and cut him loose on a real job. Get a man who is first of all absolutely square, who knows automobile values, has initiative and can handle men—both employees and customers.

Put that man at the head of an entirely separate department "Used Cars." Sell to this department the new car wanted at a fair sub-dealer's discount. Put it up to this "used car manager" to determine what should be allowed on the old car. His own income should be absolutely dependent upon the margin in its resale.

This scheme is usable best where the number of "trades" is sufficient to keep a man busy. But, be sure you know before you say "my business is too small." Where the volume is heavy it might actually become a separate enterprise; the used car man taking cars at the prices granted to regular sub-dealers. All "trades" should be turned over to this man. He should not be allowed to handle straight sales, so that he may become proficient and absolutely self-reliant in his own specialized field.

You may say "a sub-dealer's discount is too large, I ought to have full profit." One dealer, six weeks ago, had forty-five used cars on hand, their value representing a fair year's profit. The interest on the money tied up would pay him to have sold the new cars at a generous discount.

Further, this separate department idea is not merely a theory. It has been extremely successful in big city practice and in several smaller towns. One little dealer had a rule never to have more than three used cars on hand at any one time. In other words, he put it up to his sales force to make good their own trades, which they did in order to get such business.

Associations of dealers, handling "trades" through an appointed broker, agreements as to price and subsequent notification of such appraisement—all are hazardous through the risk of dealers not keeping faith. Furthermore, these co-operative enterprises are regarded as illegal in some States; for instance, under Ohio's Valentine anti-trust act.

How much better is the plan to develop your own legs and thereafter stand or fall on your own square methods! Then, the injection of a specialist's vital personal interest will work up dollars where pennies never grew before. This man will develop means of overhauling old pleasure cars for light delivery work, ultimately handle his own repair force economically and the dealer will not tie up any capital.

So long as absolute squareness is the keynote, the "used car man" will make money for himself and the associated dealer, building up a paying business from sources previously neglected. Facts can be cited to prove the success of this plan. Hence, even if it seems impossible, try it. One dealer took a twenty dollar man seven years ago and put him on this job. Today the dealer sells more cars than any two of his competitors and the "used car man" has four children raising celery, ducks and happiness on a paid-up, half acre, suburban home.

By CHARLES J. BAILEY, Boston, Mass.

It is a significant fact that the most successful dealers have no "used car" problem, and those others who do have it, will find that the solution as far as profit and loss are concerned, will depend on themselves.

There is no reason why a dealer should not take his own cars in trade. He knows, or ought to know, that his cars have a second hand value depending on their age, general reputation, and the territory in which they are sold. Let there be a definite value on the different models, to be allowed if, after inspection, they are in a certain specified condition. After the car has been taken in it should be thoroughly overhauled and sold at a standard price.

The buyer of the old car then knows that he is getting a car in good condition, and the original owner feels that he was allowed the full market value for it when he traded it in. The result is a full commission on the new car and two satisfied customers.

The dealer should set aside a certain amount of money to be tied up in used cars. When this sum has been expended, trading should cease until all the cars taken in have been disposed of. After this has been done he can start trading again, modifying his allowance if the market conditions warrant such a change. This system will at all times give him command of the greater part of his working capital and eliminate any possibility of having a lot of used cars on his hands at the end of the season which would have to be sold at a loss.

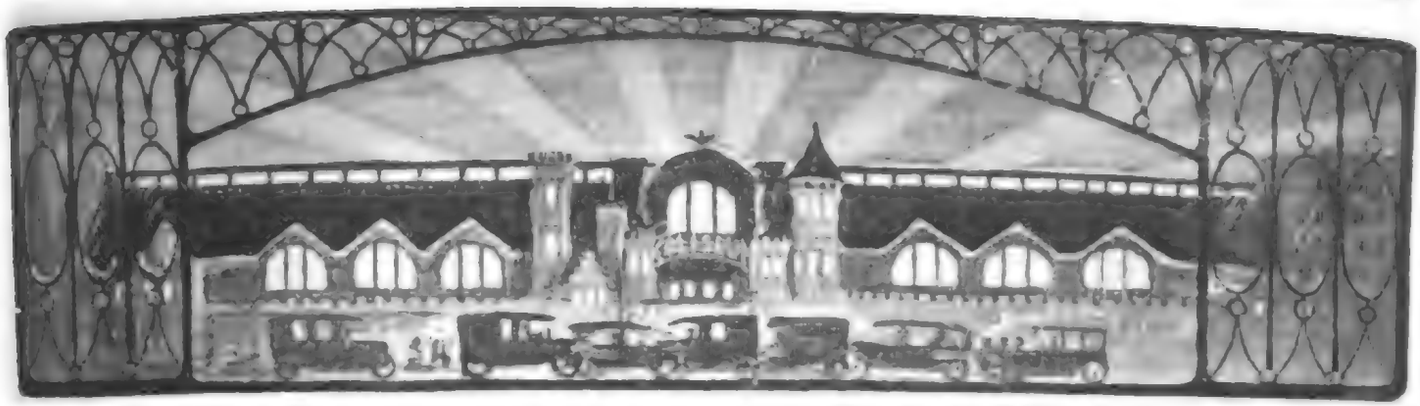
The greatest risk is in trading cars other than the dealer's own make. The average individual will go to his own dealer first, when he is in the market for a new car. If his car is one of the standard makes which gives good satisfaction, and he does not buy another of the same kind, it is safe to assume that the old car is in unusually poor condition or he expects an exorbitant allowance. With such a person an outside dealer simply wastes his time trying to sell him.

In many cases, however, the buyer wishes to change because he feels that he is getting a better car. Under those circumstances the best thing the dealer can do is to advertise the old car at the owner's expense and sell it "as is." By adopting this course the owner soon realizes the market value of his car and very often saves a middleman's profit.

It does not seem fair to expect a customer to buy the new car outright and then give the old one to the dealer to sell. Very few people care to have money tied up in an old car any more than a dealer—even though dealers be absolutely honest, the owner would always feel that their interest in selling the old car would just about be proportionate to the effect it would have on their pocketbooks.

If trading allowances are so regulated that the full commission can be obtained on the sale of the new car, the dealer will find that there will be no "used car" problem to solve.

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MORE CARS, FEWER ACCESSORIES, FOR CHICAGO

Formidable Display of Electrics Brings Number of Car Exhibits Above New York's Total—Eleven Gas Cars Also Reserved for Western Display—Radical Electric Starter to Make Its Appearance.

In the matter of automobile shows, New York will have nothing on Chicago. One show in two buildings for two weeks, which was New York's portion, stands only a little bit more than knee high to one show for two weeks in three buildings, which is the Chicago program. On Saturday night, February 1st, the top crust of Chicago's automobile pie, which in more polished language is styled the National Association of Automobile Manufacturers' 12th annual show in the Coliseum, the First Regiment Armory and the Wilson building, will be lifted and for the next seven days and eight nights, until the following Saturday night, it will be propped up high, that those who will may view the "filling."

Toothsome "Filling" in the "Pie."

The pie, of course, will be a big one, though it will not be quite as big as the one with which New Yorkers were regaled. In point of number of exhibitors, it will be somewhat smaller—in New York there were 424 separate exhibits all told; in Chicago there will be 322—though the "filling" will be as variegated and just as "toothsome," so to speak. Of the 98 cars exhibits scheduled, 22 will hold cars that were not displayed in New York, and of the 22 no less than 11 are electrics. Which is not altogether surprising, of course, for Chicago is and always has been a great city for electric cars. This year, however, they will not be spread around the show quite as much as they were in other years; they all will be in the Armory, where they can be grouped the better to permit of comparison and they will form a formidable display!

Whether they are in the Armory or the Coliseum or the Wilson building, however, will be all the same, as far as the stage setting is concerned, for the decorative scheme that has been chosen is the same for all three buildings, and it goes without saying that it will be spectacular. What with English country estates, Louis XV decorations and last year's inspiring Mosaic temple, Manager Miles of the N. A. A. M. has achieved a reputation for the unusual and the striking in decorations that it will be hard to beat, though according to present indications the decorators are not having such a hard time of it, after all.

Splendor of Cathedral Effect.

If there is any connection between a Mosaic temple and a cathedral, it is scarcely likely that an automobile show would be suspected of forming the link, palpable or otherwise. But just as last years' Chicago show resulted in the Coliseum being converted into a Mosaic temple, so has the coming show resulted in the Coliseum being turned into a cathedral. Or, at least, it will look a cathedral inside and, according to the decorative effects that have dazzled visitors at previous Chicago shows, there will be no mistaking the intention.

To begin with, there will be a "roof" of some 26 stained glass panels, each 22 feet square, though a view of the classical windows and the rest of the setting is likely to give the impression that the 26 panels really are 260 panels, for there will be great mirrors here, there and everywhere. In fact, the use of the designation "Crystal Palace," not very appropriately applied to that portion of the New York show housed in Madison Square Garden, at one time was contemplated, but out of respect for the prior claim, "hands off!" was the order. The big balcony will look almost as if it is made of stained glass and more of it will be used to distinguish the partitions between the exhibits and the signs that will blazon forth the names of the cars.

In the Armory, which is a few steps from the Coliseum, and in the Wilson building, which is "next door," the stained glass effect also will obtain, though there won't be quite as much of it. Over all, great arc lamps, also enclosed in stained glass, will diffuse soft light, and high lights will be contributed by clusters of red and white globes placed a-top ornamental pillars.

New Accessories That Will Appear.

But to get back to what the show will hold—the total list of exhibitors is 101 names shorter than was the New York list; but every bit of the discrepancy and a little bit more can be traced directly to the accessory people, for Chicago will stage eight more cars than were shown in New York. Altogether, 398 accessory exhibitors held space for the first week of the New York show—the second week of the Chicago show, by the way, will open and close on February 10 and 15th, respectively, and will be devoted to commercial cars, exclusively, and accessories, of course—and only 204 have signed up for the first week of the Chicago show. And if there had not been nine more exhibitors of cars in Chicago than there were in New York, there would have been a still larger difference in the size of the two lists. As it is, the difference is 101.

The difference in the size of the accessory list, however, cannot be construed to mean

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that there will be nothing new on view. As always has been the case, the Chicago list contains the names of more than a score of Western manufacturers who never exhibit in New York, though their wares are none the less important and none the less interesting because of the fact. Nearly all the names made familiar by conspicuous display at the New York show will be there quite as a matter of course, and the addition of about a score of new names will very nearly make up for the loss in numbers by the increase in variety.

Among the new accessories that will make their debut in the Coliseum or the Armory there are at least three that are calculated to create no end of interest; all three are brand new electric lighting and engine starting systems. The first of them is a clever combination of a gearset and an electric starter from the shops of the Warner Mfg. Co. of Toledo. The second is a new Briggs electric engine starting and lighting system which will supplement the combined lighting and ignition system that made its first appearance at the New York show. And the third is a new Vesta electric starter—or, rather, two new Vesta starters.

Newness That Centers in Electrics.

The list of car exhibitors is complete, of course; not counting the 22 exhibitors who make their first appearance of the year, the makes that appeared in New York will line the walls and fill the spaces of the Coliseum and the Armory and the Wilson building just 76 strong. Nor will all the interest center around the 22 newcomers, if they may be so styled. Quite as much interest will attach to the exhibits marked by names that are familiar to New Yorkers, for though a great many of them virtually will be "transplanted" displays, as always has been the case, a great many of them also will contain features that have been especially "saved up" for Western display. Naturally, there will be no new mechanical features that have not already been described in Motor World's great Before-Shows issue and in the issue containing the report of the New York Show, though it is altogether likely that not a few new body styles will be forthcoming.

Among the new exhibits of cars, electrics make up nearly half of the newness, as already has been stated, though only one of those to be displayed is new, strictly speaking—i. e., the Chicago electric, manufactured by the Chicago Electric Motor Car Co.; it is a standard vehicle throughout; it embodies nothing that is unusual or untried. From the motor, which is liberally proportioned to withstand hard usage, drive is by shaft to intermediate reduction gearing and thence through single reduction bevel gearing to the rear axle.

The remainder of the list of electrics includes the Argo, which is chiefly conspicuous by reason of its own distinctive foot control, the Broc, the Baker and the Detroit, which scarcely have changed at all since last they were exhibited, though several new models have been added to each line; the Borland-Grannis, which from a single model exhibited for the first time last year in Chicago has grown to a line of no less than seven models; the Ohio, the Rauch & Lang, the Waverley, the Century and the Woods. Changes are few in all of them, with the possible exception of the Baker, though even in the Baker line the standard vehicles are much the same as their predecessors. The change in the line is in a new model which has been added and which is quite different from the other Bakers. Taking a leaf out of the gasolene car makers' book, the propeller shaft is enclosed in a rigid tube connected at one end to the motor housing and at the other end to a cross frame member through a large ball and socket joint, thus permitting an unusually free spring suspension. Naturally, all torsion and radius rods are eliminated by the new construction, which is only one of the many new features of the car.

Pleasure Cars to be Exhibited in Chicago, February 1-8

Not Exhibited in New York.

Argo Elec	Glide
Austin	Great Western
Baker Elec	McFarlan
Borland-Grannis Elec	McIntyre
Broc Elec	Ohio Elec
Century Elec	Midland
Chicago Elec	Pratt-Elkhart
Colby	Rauch & Lang Elec
Crow	Staver
Detroit Elec	Waverley Elec
Diamond T	Woods Elec.

Exhibited in New York.

Abbott-Detroit	Marmon
Alco	Maxwell
American	Mercer
Auburn	Metz
Bergdoll	Michigan
Buffalo Elec	Mitchell
Buick	Moline
Cadillac	Moon
Cartercar	National
Case	Norwalk
Chalmers	Oakland
Church-Field Elec	Oldsmobile
Cole	Overland
Columbia	Packard
Cutting	Paige-Detroit
Davis	Paterson
Edwards-Knight	Pathfinder
Fiat	Peerless
Firestone-Columbus	Pierce-Arrow
Flanders	Pope-Hartford
Franklin	Premier
Garford	Pullman
Haynes	Rambler
Henderson	R. C. H.
Herreshoff	Regal
Hudson	Reo
Hupmobile	Standard Elec
Imperial	Selden
Inter-State	Stearns
Jackson	Speedwell
Kissel	Stevens-Duryea
Kline	Stoddard-Dayton
Knox	Studebaker
Krit	Stutz
Locomobile	Velie
Lozier	Westcott
Matheson	White
Marathon	Winton

The list of gasolene cars that have been reserved for the Chicago show reveals even less that is really new than does the electric list, for none of those on it is new in the sense that it never has been shown before. There is the Austin, for instance, which has not appeared in New York for many years and which makes its annual appearance at the Chicago function. Its big six-cylinder motor can be recognized anywhere by reason of the unusual manner of casting the valve pockets catacornered; its upholstery also is likely to be just a little bit deeper than any one else's, judging by last year's show cars.

In the List "Saved" for Chicago.

Crow-Elkhart is another name that is fairly familiar to Westerners, though it very seldom appears on a signpost in an Eastern show. The line will be there in force—there are four different chassis mounting nine body styles and two of the chassis are "sixes" and new. The Glide line is another that is marked by a new model that will make its first appearance. It is styled model "36-42" and mounts a block-cast, long-stroke motor, with cylinders measuring 4½ x 5¼. Th larger Glide car—the "45"—also will be there, though there has been found so little room for improvement that there is little that is new in its make-up.

The Colby and the Diamond T are two more Western cars that quite appropriately have been "saved" for Coliseum exploitation, and in the same boat, so to speak, are the Staver and the Pratt-Elkhart. The Staver line has been increased and rounded out by the addition of a "six," though in the other lines there have been no radical changes made. At the Midland booth there will be another new "six" that makes its first appearance and, of course, the familiar "4-40" with its distinctive flexible three-point supported motor will be there. The Great Western is a "four," as it always has been, and the most important change that has been made concerns not the car so much as it does the price, which is $265 less now than it was at this time last year. The McFarlans always have been "sixes," as every one knows; but the McIntyres for the first time will include a "six," one listing at less than $1,500.

Altogether, the list of Chicago exhibitors is a long one and a complete one that requires a great deal more than merely super-

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ficial examination to bring to light all of its features and all of the features of its varied exhibits. If those who visit the show have one thing more than another to be thankful for, it is that there are fewer stairs to climb to "cover" it than there were in New York. And, incidentally, they will have considerably less ground to travel in getting from one building to the other.

Summary of Cars to be Exhibited in Chicago, February 1 to 8

* Denotes not shown in New York.

Abbott Motor Co., Detroit, Mich.—Abbott-Detroit.

American Locomotive Co., Providence, R. I.—Alco.

American Motors Co., Indianapolis, Ind.—American.

Argo Electric Vehicle Co., Saginaw, Mich.—Argo electrics.*

Anderson Electric Car Co., Detroit, Mich.—Detroit electrics.*

Auburn Automobile Co., Auburn, Ind.—Auburn.

Austin Automobile Co., Grand Rapids, Mich.—Austin.*

Baker Motor Vehicle Co., Cleveland, Ohio—Baker electrics.*

Bartholomew Co., Peoria, Ill.—Glide.*

Bergdoll Motor Co., Louis J., Philadelphia, Pa.—Bergdoll.

Borland-Grannis Co., Chicago, Ill.—Borland-Grannis electrics.*

Broc Electric Vehicle Co., Cleveland, Ohio—Broc electrics.*

Buffalo Electric Vehicle Co., Buffalo, N. Y.—Buffalo electric.

Buick Motor Co., Flint, Mich.—Buick.

Cadillac Motor Car Co., Detroit, Mich.—Cadillac.

Cartercar Co., Pontiac, Mich.—Cartercar.

Case T. M. Co., J. I., Racine, Wis.—Case.

Century Electric Car Co., Detroit, Mich.—Century electrics.*

Chalmers Motor Co., Detroit, Mich.—Chalmers.

Chicago Electric Motor Car Co., Chicago, Ill.—Chicago electrics.*

Church-Field Motor Co., Sibley, Mich.—Church-Field electric.

Colby Motor Co., Mason City, Ia.—Colby.*

Cole Motor Car Co., Indianapolis, Ind.—Cole.

Columbia Motor Car Co., Hartford, Conn.—Columbia.

Columbus Buggy Co., Columbus, Ohio—Firestone-Columbus.

Crow Motor Car Co., Elkhart, Ind.—Crow.*

Cunningham, Son & Co., James, Rochester, N. Y.—Cunningham.

Cutting Motor Car Co., Jackson, Mich.—Cutting.

Davis Carriage Co., George W., Richmond, Ind.—Davis.

Dayton Motor Car Co., Dayton, Ohio—Stoddard-Dayton.

Diamond T Motor Car Co., Chicago, Ill.—Diamond T.*

Edwards Motor Car Co., New York City—Edwards-Knight.

Elkhart Carriage & Harness Mfg. Co., Elkhart, Ind.—Pratt-Elkhart.*

F. I. A. T., Poughkeepsie, N. Y.—Fiat.

Flanders Motor Co., Detroit, Mich.—Flanders.

Franklin Mfg. Co., H. H., Syracuse, N. Y.—Franklin.

Garford Co., Elyria, Ohio—Garford.

Great Western Automobile Co., Peru, Ind.—Great Western.*

Haynes Automobile Co., Kokomo, Ind.—Haynes.

Henderson Motor Car Co., Indianapolis, Ind.—Henderson.

Herreshoff Motor Car Co., Detroit, Mich.—Herreshoff.

Hudson Motor Car Co., Detroit, Mich.—Hudson.

Hupp Motor Car Co., Detroit, Mich.—Hupmobile.

Ideal Motor Car Co., Indianapolis, Ind.—Stutz.

Imperial Automobile Co., Jackson, Mich.—Imperial.

Inter-State Automobile Co., Muncie, Ind.—Inter-State.

Jackson Automobile Co., Jackson, Mich.—Jackson.

Jeffery Co., Thomas B., Kenosha, Wis.—Rambler.

Kissel Motor Car Co., Hartford, Wis.—Kissel.

Kline Motor Car Corporation, York, Pa.—Kline.

Knox Automobile Co., Springfield, Mass.—Knox.

Krit Motor Car Co., Detroit, Mich.—Krit.

Locomobile Co. of America, Bridgeport, Conn.—Locomobile.

Lozier Motor Co., Detroit, Mich.—Lozier.

Marathon Motor Works, Nashville, Tenn.—Marathon.

Matheson Automobile Co., Wilkes-Barre, Pa.—Matheson.

Maxwell-Briscoe Motor Co., Tarrytown, N. Y.—Maxwell.

McFarlan Motor Car Co., Connersville, Ind.—McFarlan.*

McIntyre Co., W. H., Auburn, Ind.—McIntyre.*

Mercer Automobile Co., Trenton, N. J.—Mercer.

Metz Co., Waltham, Mass.—Metz.

Michigan Motor Car Co., Kalamazoo, Mich.—Michigan.

Midland Motor Car Co., Moline, Ill.—Midland.*

Mitchell-Lewis Motor Co., Racine, Wis.—Mitchell.

Moline Automobile Co., East Moline, Ill.—Moline.

Moon Motor Car Co., St. Louis, Mo.—Moon.

Motor Car Mfg. Co., Indianapolis, Ind.—Pathfinder.

National Motor Vehicle Co., Indianapolis, Ind.—National.

Nordyke & Marmon Co., Indianapolis, Ind.—Marmon.

Norwalk Motor Car Co., Martinsburg, Va.—Norwalk.

Oakland Motor Car Co., Pontiac, Mich.—Oakland.

Ohio Electric Car Co., Toledo, Ohio—Ohio electric.*

Olds Motor Works, Lansing, Mich.—Oldsmobile.

Packard Motor Car Co., Detroit, Mich.—Packard.

Paige-Detroit Motor Car Co., Detroit, Mich—Paige-Detroit.

Paterson Co., W. A., Flint, Mich.—Paterson.

Peerless Motor Car Co., Cleveland, Ohio—Peerless.

Pierce-Arrow Motor Car Co., Buffalo, N. Y.—Pierce-Arrow.

Pope Mfg. Co., Hartford, Conn.—Pope-Hartford.

Premier Motor Mfg. Co., Indianapolis, Ind.—Premier.

Pullman Motor Car Co., York, Pa.—Pullman.

Rauch & Lang Carriage Co., Cleveland, O.—Rauch & Lang electrics.*

R. C. H. Corp., Detroit, Mich.—R. C. H.

Regal Motor Car Co., Detroit, Mich.—Regal.

Reo Motor Car Co., Lansing, Mich.—Reo.

Selden Motor Vehicle Co., Rochester, N. Y.—Selden.

S. G. V. Co., Reading, Pa.—S. G. V.

Speedwell Motor Car Co., Dayton, Ohio—Speedwell.

Standard Electric Car Co., Jackson, Mich.—Standard Electricque.

Staver Carriage Co., Chicago, Ill.—Staver.*

Stearns Co., F. B., Cleveland, Ohio—Stearns-Knight.

Stevens-Duryea Co., Chicopee Falls, Mass.—Stevens-Duryea.

Studebaker Corp., Detroit, Mich.—Studebaker.

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Velie Motor Vehicle Co., Moline, Ill.—Velie.
Waverley Co., Indianapolis, Ind.—Waverley electrics.*
Westcott Motor Car Co., Richmond, Ind.—Westcott.
White Co., Cleveland, Ohio—White.
Willys-Overland Co., Toledo, O.—Overland.
Winton Motor Carriage Co., Cleveland, Ohio—Winton.
Woods Motor Vehicle Co., Chicago, Ill.—Woods electrics.*

The 204 Accessory Exhibitors and What They Will Display

* Denotes not exhibited in New York; † denotes will remain for second week; undesignated remain first week only.

A. S. K. Co., Cincinnati, O.—*
Ajax-Grieb Rubber Co., New York City—Ajax tires.†
American Ball Bearing Co., Cleveland, Ohio—American axles and worm gearing.†
American Bronze Co., Berwyn, Pa.—Non-Gran bearing metal.†
Armiger Chemical Co., Chicago, Ill.—Polishes.*
Arnold, N. B., Brooklyn, N. Y.—Slikup cleaning specialties.
Auto Parts Co., Chicago, Ill.—Parts*†
Automatic Motor and Engineering Co., Chicago, Ill.—Church pneumatic system.*†
Automobile Supply Mfg. Co., Brooklyn, N. Y.—Newtone signals and Rubes horns.
Badger Brass Mfg. Co., Kenosha, Wis.—Solar lamps.†
Baldwin Chain & Mfg. Co., Worcester, Mass.—Baldwin chains.†
Baldwin Steel Co., New York City—Baldwin steels.†
Barco Brass & Joint Co., Chicago, Ill.—Exhaust horns, cut-out valves, pedals.*
Batavia Rubber Co., Batavia, N. Y.—Batavia tires.
Berg Auto Trunk & Specialty Co., New York City—Berg trunks and carriers.
Blackledge Mfg. Co., John W., Chicago, Ill.—Velvet auxiliary springs.
Bower Roller Bearing Co., Detroit, Mich.—Bower roller bearings.†
Bowser & Co., S. F., Fort Wayne, Ind.—Fuel pumps and storage systems.†
Breakstone, S., Chicago, Ill.—Watch Dog lever locks.*
Briggs Magneto Co., Elkhart, Ind.—Briggs magnetos, lighting and starting systems.†
Brown Co., Syracuse, N. Y.—B'Co. pumps and specialties.
Brown-Lipe Gear Co., Syracuse, N. Y.—Brown-Lipe gears and gearsets.†
Buda Co., Harvey, Ill.—Buda motors and gearsets.†
Byrne, Kingston & Co., Kokomo, Ind.—Kingston carburetters.†
B. & L. Auto Lamp Co., New York City—B. & L. lamps and fittings.
Champion Ignition Co., Flint, Mich.—A-C spark plugs.†
Chicago Drop Forge & Foundry Co., Chicago, Ill.—Drop forgings.†
Coes Wrench Co., Worcester, Mass.—Wrenches.
Columbus Auto Parts Co., Columbus, O.—Parts.*
Connecticut Telephone & Electric Co., Meriden, Conn.—Connecticut shock absorbers, magnetos and ignition devices.
Continental Motor Mfg. Co., Muskegon, Mich.—Continental motors.*†
Consolidated Rubber Tire Co., New York City—Kelly-Springfield tires.*
Cook's Sons, Adam, New York City—Albany grease and lubricating oils.
Cotta Transmission Co., Rockford, Ill.—Gearsets.†
Cowles & Co., C., New Haven, Conn.—Lamps, heaters and body fittings.
Cramp & Sons Ship & Engine Bldg. Co., Wm., Philadelphia, Pa.—Parsons's white brass and bronze bearing metals, bearings and worm gears.†
Dayton Rubber Mfg. Co., Dayton, Ohio—Dayton Airless tires.
Daniels, Smalley, Detroit, Mich.—Sundries.
Dean Electric Co., Elyria, Ohio—Tuto and Rexo signals, Dynalux electric lighting systems, Otho and Elyria-Dean electric lighting and starting systems, Elyria-Dean speedometers, Hi-Fre-Co ignition systems.
Detroit Electrical Appliance Co., Detroit, Mich.—Deaco electric lighting systems.
Diamond Chain & Mfg. Co., Indianapolis, Ind.—Diamond chains.†
Diamond Rubber Co., Akron, Ohio—Diamond tires.†
Dixon Crucible Co., Jos., Jersey City, N. J.—Graphite lubricants.†
Doehler Die Casting Co., Brooklyn, N. Y.—Die cast parts.
Double Fabric Tire Co., Auburn, Ind.—Tires and inner tubes.
Dykes Co., John L., Chicago, Ill.—Tire protectors.
E-C Sales Co., Chicago, Ill.—Axles, demountable wheels, tire holders, etc.*
Eavenson Sons, Inc., J., Camden, N. J.—Jesco soaps and polishes.
Economy Equipping Co., Chicago, Ill.—Supplies.*†
Edelmann & Co., E., Chicago, Ill.—Tire gauges, valves, etc.
Edison Storage Battery Co., West Orange, N. J.—Edison batteries.*†
Electric Products Co., Chicago, Ill.—*
Empire Tire Co., Trenton, N. J.—Empire tires.†
Edmunds & Jones Mfg. Co., Detroit, Mich.—Lamps.†
Endurance Tire & Rubber Co., New York City—Endurance red inner tubes.
Electric Storage Battery Co., Philadelphia, Pa.—Exide storage batteries.†
Esterline Co., Lafayette, Ind.—Berdon electric lighting and starting system.†
Federal Rubber Mfg. Co., Milwaukee, Wis.—Federal tires.
Findeisen & Kropf Mfg. Co., Chicago, Ill.—Rayfield carburetters.†
Firestone Tire & Rubber Co., Akron, Ohio—Firestone tires.†
Fisk Rubber Co., Chicopee Falls, Mass.—Fisk tires.†
Gabriel Horn Mfg. Co., Cleveland, Ohio—Gabriel horns and rebound snubbers.†
Garage Equipment Co., Milwaukee, Wis.—Universal bumpers, tire holders, windshields, vulcanizers, jacks and lamps.†
Gemmer Mfg. Co., Detroit, Mich.—Gemmer steering gears.†
Gibney Rubber Co., J. L., Philadelphia, Pa.—Tires and vulcanizers.†
Globe Machine & Stamping Co., Cleveland, Ohio—Steel tool boxes, metal hampers, fenders and sheet metal parts.†
Goodrich Co., B. F., Akron, Ohio—Goodrich tires.†
Goodyear Tire & Rubber Co., Akron, O.—Goodyear tires.†
Gould Storage Battery Co., New York City—Gould batteries and Duplex lighting and ignition systems.†
Grant-Lees Mch. Co., Cleveland, Ohio—Gearsets.
Gray & Davis, Amesbury, Mass.—Lamps and electric starting and lighting systems.†
Ham Mfg. Co., C. T., Rochester, N. Y.—Lamps.*
Halladay Co., L. P., Streator, Ill.—Sundries.*
Harrow Spring Co., Milwaukee, Wis.—Springs.*
Harris Oil Co., A. W., Providence, R. I.—Lubricants.†
Hartford Suspension Co., Jersey City, N. J.—Truffault-Hartford shock absorbers, Hartford electric starting and lighting systems and jacks and bumpers.†
Havoline Oil Co., New York City—Havoline lubricants.†
Hayes Mfg. Co., Detroit, Mich.—Metal bodies, tool boxes, running boards and sheet metal parts.
Hess Spring & Axle Co., Carthage, Ohio—Springs and axles.†
Heinze Electric Co., Lowell, Mass.—Magnetos and coils.†

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Hoffecker Co., Boston, Mass.—Hoffecker Steady Hand speedometers.

Homo Co. of America, Philadelphia, Pa.—Homo carburetters.†

Hyatt Roller Bearing Co., Newark, N. J.—Hyatt flexible spiral steel roller bearings.†

Ignition Starter Co., Detroit, Mich.—Disco acetylene and electric starting and lighting systems.†

Illinois Tire Filler Co., Chicago, Ill.—Tire filler.*

Imperial Brass Mfg. Co., Chicago, Ill.—Carburetters and brass parts.*†

International Acheson Graphite Co., Niagara Falls, N. Y.—Oildag and Gredag lubricants.

International Metal Polish Co., New York City—Blue Ribbon polishes.

J-M Shock Absorber Co., Philadelphia, Pa.—J-M shock absorbers.

Kent Mfg. Works, Atwater, Philadelphia, Pa.—Unisparker ignition systems and Monoplex horns.†

Kellogg Mfg. Co., Rochester, N. Y.—Hand and power pumps and air engine starters.

Kokomo Electric Co., Kokomo, Ind.—Kingston magnetos, coils and timers.†

K-W Ignition Co., Cleveland, Ohio—K-W magnetos and coils.

Laidlaw, Jr., Wm. B., New York City—Top and cover fabrics.

Leather Tire Goods Co., Niagara Falls, N. Y.—Woodworth tire treads, Kant Skid tire bands, repair boots, etc.

Lee Tire & Rubber Co., Conshohocken, Pa.—Lee and Leland tires and Waymaker exhaust horns.

Lefevre Arms Co., Syracuse, N. Y.—Gearsets.†

Lindsey, T. J., Indianapolis, Ind.—Rear axles.*

Link Belt Co., Philadelphia, Pa.—Silent chains.†

Longdin-Brugger Co., Fond du Lac, Wis.—Tops.*

Lovell-McConnell Mfg. Co., Newark, N. J.—Klaxon horns, Conover safeguards.

Lycoming Foundry & Mch. Co., Williamsport, Pa.—Lycoming-Mead motors.

Marathon Tire & Rubber Co., Cuyahoga Falls, Ohio—Marathon tires.

Marburg Bros., Inc., New York City—Mea magnetos, S. R. O. bearings.†

Mayo Mfg. Co., Chicago, Ill.—Pumps and gauges.

McCord Mfg. Co., Detroit, Mich.—Radiators, lubricants, fans and McKim gaskets.†

McCue Co., Buffalo, N. Y.—McCue axles and wire wheels.

Metal Stamping Co., Long Island City, N. Y.—Stampings.

Michelin Tire Co., Milltown, N. J.—Michelin tires.*

Model Gas Engine Works, Peru, Ind.—Model motors.†

Morrison-Recker Mfg. Co., Grinnell, Ia.—Grinnell gloves.*

Mossberg, Frank, Attleboro, Mass.—Wrenches.

Motsinger Devices Mfg. Co., Pendleton, Ind.—Motsinger autosparkers and carburetters.†

Motometer Co., New York City—Motometer temperature indicators.

Motz Tire & Rubber Co., Akron, Ohio—Motz cushion tires.†

Muncie Gear Works, Muncie, Ind.—Gears, wheels and gearsets.†

National Coil Co., Lansing, Mich.—Spark coils.†

National Motor Supply Co., Cleveland, Ohio—National pumps and vulcanizers.

National Rubber Co., St. Louis, Mo.—Tire preservative.

National Tube Co., Pittsburg, Pa.—Seamless steel tubing.†

New Jersey Car Spring & Rubber Co., Jersey City, N. J.—Carspring tires.

New Miller Carburetter Co., Indianapolis, Ind.—New Miller carburetters.†

New York & New Jersey Lubricants Co., New York City—Columbia lubricants.

Norma Co. of America, New York City—Norma ball bearings.

North East Electric Co., Rochester, N. Y.—North East electric lighting and starting systems.†

Northway Motor & Mfg. Co., Detroit, Mich.—Northway motors.†

Oliver Mfg. Co., Chicago, Ill.—Oliver and Sampson jacks.*†

Pantosote Co., New York City—Pantasote top and seat coverings.†

Peacock Co., Clarence H., New York City—Ames shock absorbers.

Peck Wheel Co., Chicago, Ill.—Peck spring wheels.*

Pennsylvania Rubber Co., Jeannette, Pa.—Pennsylvania tires.†

Perkins-Campbell Co., Cincinnati, Ohio—Straps and license brackets.*

Perfection Spring Co., Cleveland, Ohio—Krupp steel springs.†

Pittsfield Coil Co., Pittsfield, Mass.—Pittsfield magnetos, coils, etc.*†

Piel Co., G., Long Island City, N. Y.—Long horns and G-P muffler cut-outs.

Pratt Mfg. Co., Wm. E., Chicago, Ill.—Bodies.*†

Racine Mfg. Co., Racine, Wis.*

Racine Rubber Co., Racine, Wis.—Racine tires.*

Randall-Faichney Co., Boston, Mass.—Jericho and Jubilee exhaust horns, muffler cut-outs, B'Line grease guns, Jericho gas regulators, Webster tank gauges and other sundries.

Remy Electric Co., Anderson, Ind.—Remy magnetos, lighting and starting systems.†

Republic Rubber Co., Youngstown, Ohio—Republic tires.†

Rhineland Machine Works Co., New York City—Rhineland bearings.†

Rich Tool Co., Chicago, Ill.—Tools and Tungsten valves.

Ross Gear & Tool Co., Lafayette, Ind.—Tools.†

Royal Equipment Co., Bridgeport, Conn.—Duplex and Raymond brakes, Raybestos brake linings, Gyrex mixers.†

Rutenber Motor Co., Marion, Ind.—Rutenber motors.*†

Sager Co., J. H., Rochester, N. Y.—Sager bumpers and supplementary springs.

Searborough Co., Indianapolis, Ind.—Maps and road guides.*

Sarco Engineering Co., New York City—Coventry chains.†

Schoen-Jackson Co., Media, Pa.—Feps carburetters and flexible metal hose.

Schrader's Sons, Inc., A., New York City—Universal tire valves and pressure gauges.†

Seamless Rubber Co., New Haven, Conn.—Seamless tires and inner tubes.

Shaler Co., C. A., Waupun, Wis.—Shaler vulcanizers.

Sheldon Axle Co., Wilkesbarre, Pa.—Axles and springs.†

Simms Magneto Co., New York City—Simms magnetos.

S. K. F. Ball Bearing Co., New York City—S. K. F. ball bearings.

Smith Co., A. O., Milwaukee, Wis.—Parts.†

Sparks-Withington Co., Jackson, Mich.—Fans and Sparton horns.

Spicer Mfg. Co., Plainfield, N. J.—Spicer universal joints.†

Splitdorf Electrical Co., Newark, N. J.—Splitdorf magnetos, coils, plugs and other ignition devices, also electric lighting system.†

Standard Roller Bearing Co., Philadelphia, Pa.—Standard ball and roller bearings.†

Standard Welding Co., Cleveland, Ohio—Stanweld rims, electrically welded tubing and parts.†

Standard Thermometer Co., Boston, Mass.—Standard speedometers and Abell tire pumps.

Stewart & Clark Mfg. Co., Chicago, Ill.—Stewart speedometers.†

Stromberg Motor Devices Co., Chicago, Ill.—Stromberg carburetters.†

Swinehart Tire & Rubber Co., Akron, Ohio—Swinehart tires.†

Texas Co., New York City—Lubricants.†

Thermoid Rubber Co., Trenton, N. J.—Thermoid tires.

Thurber Rotary Starter Co., Detroit, Mich.—Engine starters.*

Timken-Detroit Axle Co., Detroit, Mich.—Timken hollow cast steel wheels and bevel and worm axles.†

(Continued on page 34.)

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48 DEALERS OCCUPY SPACE IN BUFFALO'S 11TH SHOW

Four-cylinder Car to Holder of "Lucky Ticket" a Drawing Card—Green and Gold the Decorative Color Scheme.

"A Four-Cylinder Car to the Holder of the Lucky Ticket" announced the publicity which advertised the 11th annual show of the Buffalo Automobile Dealers' Association, which was inaugurated in the Broadway Auditorium Monday evening last, January 27th, and will continue throughout the present week, and in a measure, perhaps, the phrase was accountable for the crowded show floor which prevails and which has prevailed throughout the week. Each of the numbered tickets sold at the door is a potential prize winner, the prize being an Empire touring car, which is on exhibition.

For the occasion, the building is "all dressed up," so to speak. Green and gold streamers are hung from a central point in the gable roof to the eaves, the streamers of alternate coloring being so closely spaced that the ceiling is invisible from the floor. To the permanent illuminating facilities which are provided have been added myriad incandescents disposed on standards, which also serve to bear signs in the form of shields which announce the titles of the various exhibits. One large decorative piece, a fountain in the form of a lion, faces the main entrance; it is flanked on either side by a high garden wall literally covered with blossoms, which serves both as a draught arrestor and an attractive ornament.

Motor car dealers, 66 strong, have taken all of the available space for the display of as many different makes of cars which they stock. One new accessory in the shape of a folding sheet metal top for converting an open car temporarily into a limousine, and which is made by R. J. Conover & Co., Buffalo, cropped out among the exhibits of the 16 accessory dealers.

The exhibitors of motor cars are: Co-Operative Motor Car Co., Abbott-Detroit, Pope-Hartford, Alco and Stevens-Duryea; Ralph E. Brown Motor Car Co., American, Rauch & Lang, and Winton; Barrett Motor Car Co., Paige-Detroit; Buffalo Electric Vehicle Co., Buffalo Electric; Buick Motor Co., Buick; Kane Motor Supply Co., Cadillac; Louis Engel, Jr., Cartercar; Mason B. Hatch, Chalmers, Stearns-Knight; Joseph Rath, Chevrolet and Little; Cole Motor Co. of Buffalo, Cole; Monroe Motor Car Co., Maxwell, Lenox, and King; Anderson Carriage Co., Detroit Electric; Delaware Avenue Garage & Motor Co., Detroiter; Buffalo Automobile Sales Co., Fiat and Pullman; Werick Bros. Motor Car Co., Firestone-Columbus and Haynes; Meyer Motor Car Co., Flanders Six and Reo; Ford Motor Co., Ford; George Ostendorf, Franklin; Zimmer Motor Vehicle Co., Henderson, Davis, and National; Buffalo-Hudson Sales Co., Hudson; Henry Brunn, Hupmobile and Peerless; F. A. Ballou, Jackson; Buffalo Kissel Kar Co., Kissel-Kar and Simplex; Krit Motor Car Co., Krit; R. G. Danahy Co., Lozier; Mutual Motor Car Co., Marathon; Harry L'Hommedieu, Marion; McFarlan Co., McFarlan; Progressive Motor Car Co., Michigan; J. J. Gibson Co., Mitchell and Empire; Centaur Motor Co., Oakland; Olds Motor Works, Oldsmobile; Overland-Buffalo Co., Overland and Garford; Packard Motor Car Co., Packard; Brighton Motor Co., Palmer-Singer; Pierce-Arrow Sales Co., Pierce-Arrow; Lutz Automobile Co., Premier and White; Regal Motor Sales Co., Regal; J. A. Cramer, Stoddard-Dayton and Marmon; Velie Motor Sales Co., Velie; J. I. Case Threshing Machine Co., Case; Glide Sales Co., Glide; Thomas B. Jeffery Co., Rambler; Mercer Auto Sales Co., Mercer; Poppenburg Motor Car Co., Warren and Imperial; W. P. Smith, Metz; Verbeck & Palmer, Paterson; Yearke Bros., Schacht.

Accessories are shown by: Ajax Tire & Rubber Co., Automobile Insurance Salvage Co., Brussi & Co., R. J. Conover & Co., F. G. Crone, Frontier Tire & Rubber Co., Iroquois Rubber Co., Indian Refining Co., Jaynes Auto Supply Co., Kendall Refining Co., Theo. Meinhardt, Charles E. Miller, Oxypather Co., Pyrene Mfg. Co., Selleck Auto Equipment Co., Wayne Oil Tank & Pump Co.

Trucks Replace Cars at Philadelphia.

Scarcely had the last strains of "Home, Sweet Home," which brought to a close on Saturday evening last, 25th inst., Part I of the 12th annual show of the Philadelphia Automobile Trade Association, died out when the pleasure car exhibits were rolled out to be replaced by the 31 different makes of commercial vehicles, which will hold sway until Saturday evening next, February 1st. Naturally, the decorations in the shape of scenes on canvas which garnish the walls of the Garage Building of the Automobile Club of Philadelphia were left intact.

The commercial vehicles on display are: Granum, Locomobile, Chase, Autocar, White, Pierce-Arrow, Packard, Garford, Alco, G. M. C., Kelly-Springfield, Wilcox, Devon, Kissel, General Vehicle, Peerless, Commerce, Hewitt, Mack, Saurer, International, Lauth-Juergens, Stewart, Mais, Walker, Detroit, Automatic, Lansden, Webb, Baker, Commercial.

PROVIDENCE DEALERS STAGE RIVAL SHOWS IN SAME WEEK

Forty-four Retailers Constitute Larger Exhibition, Ten the Smaller—One Display in Hotel Ballroom.

Rival shows are on at Providence, R. I. Both were inaugurated Saturday evening last, January 26th, and will continue until Saturday next, February 1st; the larger, which occupies the State Armory, comprises 61 different makes of motor cars, both pleasure and commercial, displayed by 44 dealers and a comparatively large complement of accessory and motorcycle exhibitors, and is staged under the auspices of the Rhode Island Automobile Dealers' Association. The smaller show—Salon, as it is called—is fathered by the Motor Car Dealers' Association of Providence and occupies the ball room of the Narragansett Hotel; the show comprises ten different car exhibits.

The vehicles displayed at the Armory are: Pierce-Arrow, Buick, R. C. H., Alco, Pope-Hartford, Stevens-Duryea, Studebaker, Reo, Packard, Paige-Detroit, Jackson, Mitchell, Krit, Locomobile, Winton, Hudson, Premier, Peerless, Pilot, Chalmers, Knox, Cadillac, Oakland, National, Case, Baker, Stanley, Rambler, Regal, Cutting, Warren, Lenox, Abbott-Detroit, Herreshoff, Speedwell, Nyberg, Stoddard-Dayton, Overland, American, Velie, Cole, Garford, Standard, Franklin, White, Metz, Palmer-Singer and Marion. Commercial cars—Alco, Universal, Peerless, Reo, Packard, Pierce-Arrow, Federal, Besseiner, Pope-Hartford, Mercedes, Daimler, Chase, Palmer-Moore, Mais, I. H. C., Brown, Knox, Modern, White, and Little Giant.

In the ball room show are: Stearns, Mercer, Apperson, Stutz, Hupmobile, Simplex, Fiat, Renault, Marmon and Lozier.

Eighteen Dealers Exhibit at Troy.

"Billikins" and other grotesque statuettes oddly grouped against a backing comprising scarlet and gold draperies, not to mention a pagoda which serves as a bandstand, are the "fixings" which add attractiveness to the third annual show of the Troy Automobile Dealers' Association, which opened its doors on Monday evening last, January 27th, and which will be in full swing until Saturday next, February 1st. Eighteen car exhibits and a handful of accessory displays constitute the show. The cars on display are:

Packard, Cole, Peerless, Pierce-Arrow, Locomobile, National, Speedwell, Kisse Krit, Maxwell, Buick, Ford, Lozier, Studebaker, Reo, Stearns, Little, Selden.

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CLAIMS 50% TIRE SAVING FOR SIX-WHEELED VEHICLE

Dow Dual Wheels, Now Ready for Market, Permit Greater Traction and Also Eliminate Skidding —Features of the Design.

After considerable experimentation and much time spent in surmounting the difficulties placed in the path of every inventor of radical ideas, Alexander Dow, of erstwhile tire fame and at present president of the Dual Wheel Co. of New York City, at length has brought to practical perfection the design for a six- or eight-wheeled commercial vehicle, the first inkling of which leaked out nearly a year ago with the incorporation of the exploiting company. From a small demonstrating model, described at the time in Motor World, the idea has borne fruit in the form of a full-sized 'bus which, during the continuance of Part II of the New York Automobile Show, was used as a "ferry" between Madison Square Garden and Grand Central Palace.

In the interim between its first public announcement and its actual public appearance the design has changed in no whit, and in its material aspects the 'bus that exemplifies the inventor's ideas presents nothing more startling than an ordinary vehicle equipped with an extra pair of rear wheels overlapping the usual pair. From which it appears that the original plan to equip both front and rear with dual wheels has been changed slightly and in explanation of the change it is pointed out that, as the weight on the front wheels varies only slightly and is considerably less than that carried by the rear wheels, it has not been found necessary to add the complications required in equipping the front as well.

The idea behind the scheme is not really new, of course, and has been seen in Molesworth's 'buses, in slightly modified form, and in Reeves's Sexto- and Octo-Autos. It was from the Molesworth vehicle, in fact, that Dow obtained his idea, though in working it out to its present form he has found it necessary to deviate considerably from the plans as laid down by Molesworth, whose principal object was to obviate side-slip.

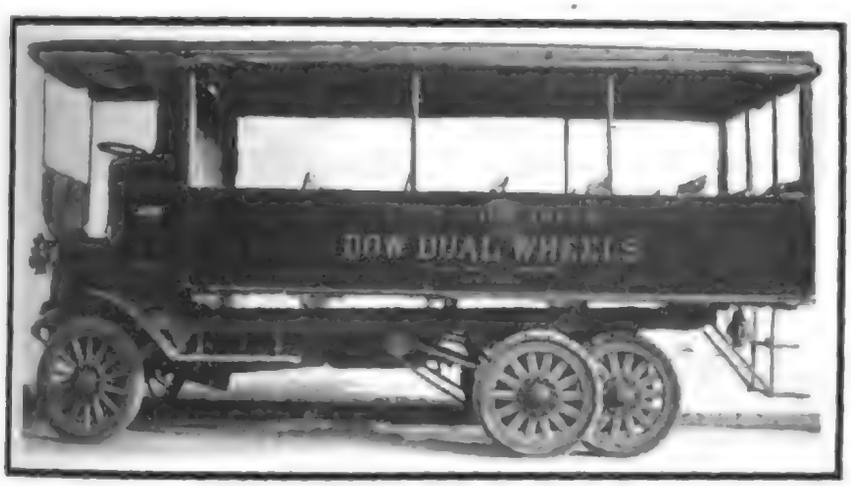
Thus, for instance, Molesworth drove only one pair of rear wheels, whereas Dow drives both pairs, and in this way obtains considerably greater traction than can be obtained where only one pair is driven. The reduction of side-slip follows as a matter of course, for the four tires provide greater contact with the road than do two. In the claims for the construction, however, greatest stress is laid upon the greater traction obtainable with due regard for the consequent increase in braking capacity.

The demonstrating vehicle used by Dow, as the head of the Dual Wheel Co., is a standard five-ton Mack truck that differs from orthodox construction only as regards its rear axle and the additional equipment represented by the two extra wheels. Incidentally, it is pointed out by Dow that the added cost of equipping a vehicle with Dual wheels is so slight—nominally about $100—as to place no serious obstacle in the way of their general adoption.

Making use of the fairly well-known Bogey truck principle, universally used on all steam and electric railroads, each of the wheels in a pair is mounted on a stub axle carried at either end of what has been styled an "equalizing bar, which is carried on bearings at the end of and transverse to the main rear axle; the "equalizing" bar therefore is free to oscillate about the main axle, permitting the equal distribution of the load over each wheel regardless of depressions or obstacles in the road. The "equalizing" bar is in effect a lever of the second class, the net result of the arrangement being that only half the movement of the wheels is transmitted to the main axle.

Road shock therefore is diminished more than half, consideration being taken of the fact that the load is supported on four tires instead of two, which lends point to the claim for lessened depreciation and decreased expense for repairs and the practical elimination of damage or breakage of goods in transit. Similarly, in explanation of the claim for considerably greater fuel economy and for greater economic speed under all ordinary conditions, attention is directed to the fact that less actual effort is required from the engine in forcing the wheels to climb out of declivities in the road or to surmount obstacles.

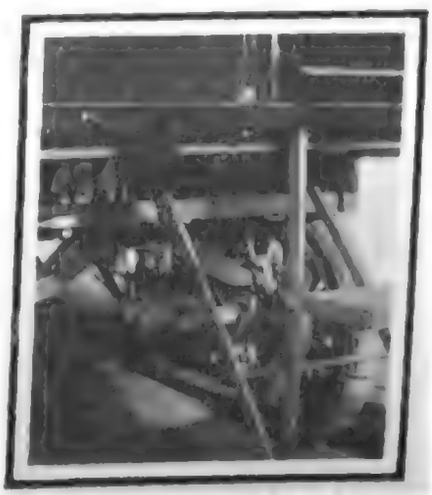
Power from the engine is transmitted from the jackshaft by side chains to the forward pair of wheels exactly as it is done in the standard truck, the wheels themselves being in exactly the same position with regard to the chassis as they are in the orthodox vehicle. The front wheels are, however, fitted with extra sprockets and drive the rear wheels through the inter-



SIDE VIEW, SHOWING APPEARANCE OF DOW DUAL WHEELS



ACTION OF THE AXLES



CONSTRUCTIONAL DETAILS

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mediary of an extra pair of chains. The wheels measure 36 inches in diameter—somewhat smaller than the standard Mack wheels—and are spaced 25 inches from center to center, the construction therefore being compact. The width, from hub cap to hub cap, actually is less than it is on the standard truck, the gauge being 70 inches instead of 71 inches, though the real dimensions might not be suspected by reason of the overlapping of the wheels. Adjustment of the main driving chain can be made in the usual manner by the screw in the end of the radius rod, and there is provision for tightening the drive to the rear wheels by means of an eccentric. There are brakes on all four wheels.

As both pairs of rear wheels always are parallel, in contradistinction to Molesworth's design, in which one pair steered with the front steering wheels, chain drive is entirely practicable. Though it might be supposed that in rounding sharp corners some slight slip might take place by reason of the theoretical and practical difference of direction of the wheels, such is not the case, according to inventor Dow. In explanation of the seeming impossibility, it is offered that the natural distortion of the rubber in the tires is more than sufficient to allow for the difference and effectually to obviate slip, even on the shortest turning radius. In support of the contention, it is stated that the absence of slip may be determined either by observing the rear wheels as the vehicle is rounding a sharp corner, or by cramping the wheels and moving th etruck by hand, when no more effort will be required to move it than is required when the wheels are headed "straight on."

For the present, the Dual Wheel Co. will content itself with the production of a limited number of sets of wheels which will be offered to responsible manufacturers for trial, the ultimate object being the licensing of manufacturers to build the wheels themselves under the Dow patents. Eventually, it is given out, efforts may be made to apply the system to pleasure cars—in fact, plans already have been drawn and a model made showing its application to a wire-wheeled pleasure car—though the near future holds forth no real possibilities of its accomplishment.

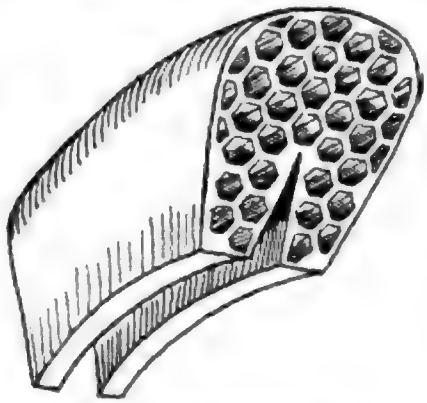
Mud That Met a Valve Emergency.

That necessity is the mother of invention and no person can be more ingenious on occasion than the motorist, was emphasized again quite recently by a precarious pickle in which one tourist found himself. He was afflicted with a badly pitted exhaust valve and as he had no valve grinding compound with him he used the next best thing—which was plain mud.

AIRSHIP CONSTRUCTION IN SECTIONAL INNER TUBES

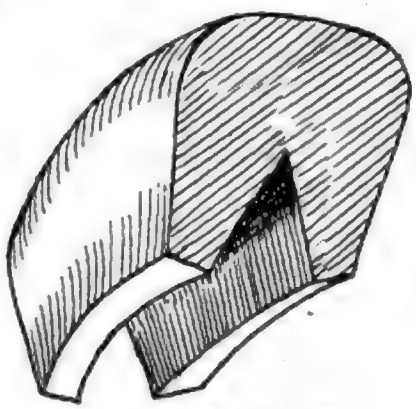
Hexagonal Chambers That Share Responsibility in Roberts Cellular Invention—Extra Weight Offset by Less Equipment.

To eliminate the common, if not particularly agreeable, practice of carrying tires on the running board, and with the storing of spare inner tubes in the tool box, is indirectly the object of the Roberts Rubber Mfg. Co., of New York. In other words, the company is manufacturing an inner tube



ROBERTS TUBE BEFORE SEALING

designed to be proof against blow-outs and indifferent to punctures, these ends being attained, it is explained, by following the example of shipbuilders and of the famous Count Zeppelin in providing a large number of small compartments, each so small



ROBERTS TUBE INFLATED

that its deflation is a matter of small moment. The company was organized several months ago and, as already stated in Motor World, capitalized at $1,000,000, and has equipped a factory at Trenton, N. J., where the Roberts cellular inner tubes are being produced.

A complete inner tube is composed of from six to ten sections, according to the tire diameter, and each section is traversed from end to end by a series of hexa onal air-containing cells, each about ⅜ in in diameter and separated by walls 1/16 nch thick, as shown in the first illustration The parts are made up with all the cells c sed at one end and open at the other, and the final process consists in filling them ith compressed air and sealing up the pen ends with rubber, which is vulcanize in place, preventing the escape of the air. The second illustration shows a section infl ed.

In the base of the tube is a V-sh ed groove running from end to end. When the cells are deflated, as in the first illustrat on, the groove is almost closed. The air p ssure, however, spreads it out; when a t be is put in place in a shoe the groove is cl sed up by bringing the edges together wit a tool provided for the purpose, and the utward pressure exerted against the beac of the shoe causes the bead to hold so tig tly to the rim that, it is stated, the use of b lts and lugs is unnecessary.

In the event of an ordinary puncture, only a small part of a single section is affected, while even if a tube should be punctured clear through to the rim the difference in the carrying capacity of the tire as a whole would be affected only slightly. The Roberts tube contains about four times as much rubber as an ordinary tube and therefore is four times heavier; but the makers claim that this added weight, which amounts to about 10 pounds per wheel—more or less, according to the size of the tire—is much more than offset by the lightening of the car consequent upon the discarding of extra tires, tubes, pumps, repair apparatus, tire irons and so on. Tubes are manufactured for tires of any size and any style.

To Make Fires "Commit Suicide."

When a motor backfires an dsets fire to gasolene in the pan, or gasolene that has leaked out becomes ignited in any other way, the usual procedure is to throw sand or dust on it, or else to turn a fire extinguisher on the flames, if there is one on the car. A new plan has been evolved, however, by the Inst Lighter Co., of Columbus, O., well known as manufacturers of acetylene lamp lighters. The idea is to make the fire "commit suicide," as the Inst people put it, by hanging a chemical extinguisher having an easily fused plug under the hood on the front of the dashboard. Abnormal heat melts the plug and the contents of the brass cylinder emerge in the form of a gas which expands enormously and envelops everything in its vicinity with a blanket of vapor that will not itself support combustion and keeps off the air. The "Fire Out" extinguisher, as it is called, can be exchanged, when discharged, for one that is fully charged, at a cost of $1.50; the price of the first extinguisher is $5.

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"ACTION" A MEANS OF ARRESTING ATTENTION

Moving Demonstrations That Interest and Hold the Public When Other Methods Prove Unavailing—Automobile Show Reveals Numerous "Stunts" That Are as Adaptable to the Dealer's Uses.

Wherever there is action there's attention.

Attention is what the merchant first seeks to gain from the purchaser; attention secured, sales may result. Wherefore one problem of the business man is to draw attention to his business.

The automobile or accessory retailer, seeking methods of drawing attention, ordinarily would be obliged to cover an extensive territory, viewing the methods of other tradesmen, but an opportunity which is afforded every year wherein the field of search is narrowed to a convenient and constricted area is found at the annual automobile shows, where manufacturers of cars and accessories vie with each other in winning for their exhibits the attention of the passing throng.

Ducks and Fish as Attention Winners.

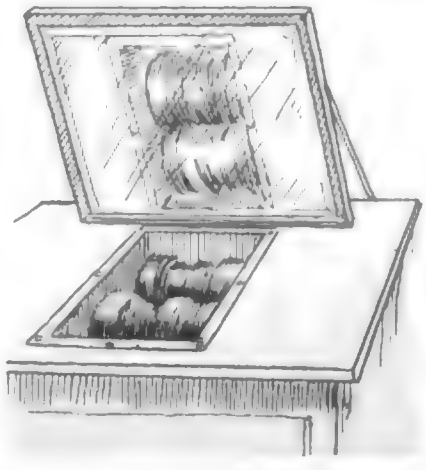
Ducks and goldfish at an automobile show may seem a far-fetched suggestion to the man endeavoring to devise a novelty for drawing a crowd to his exhibit until the apparent incongruity is explained away, which explanation can be given by anyone who saw the exhibit of William B. Laidlaw, Jr., in the basement of Madison Square Garden, during the show there. Laidlaw is a manufacturer of top and upholstering cloths and the ducks and fish were used in his demonstrations of the waterproof qualities of his fabrics.

As a starter, he erected an iron tubing standard so constructed that the draping of his cloth over rectangles of tubing formed depressions which, with the addition of water, made a couple of miniature ponds. In one of these he placed four ducks and in the other a number of goldfish. The ducks and fish furnished the "action" that served to draw attention to the exhibit, and those who stopped to look necessarily were impressed with the fact that Laidlaw's cloth is waterproof, for the ponds were there night after night, and the under side of the cloth was absolutely dry. A Chinese Mandarin duck, which endeavored to monopolize the whole pond and which pecked at his companions was always a source of amusement. And just as this feature might well serve as a lesson to the public and an attention-arrester in any show window, so there was scarcely an attraction of this sort which might not be adapted by any retailer of cars or accessories, although probably most of the features are better suited to the accessory trade. Also, there may be devised other originalities, just as Laidlaw conceived the idea of making the ducks help tell his story.



DUCKS AND FISH FOR FABRICS

For a movement device which appeals to the car or accessory dealer, the Westinghouse Electric & Mfg. Co., in the Grand Central Palace, presented something unique in a complete lighting and starting system in operation. The bare system was arranged on a long, wide table, headlights, spark plugs, speedometer lamp, attached to a dashboard, controls and the wiring, and a battery was operating the whole system, showing an observer just how it works.



GREASE PERFORMING ITS MISSION

Clever effects, while there was no movement, were achieved by the Gould Storage Battery Co. and the Packard Motor Car Co. The former, at the Palace, was located in front of one of the many big scenic pictures which covered the walls, in this case a summer touring scene with a big car rushing directly into the foreground; behind the painted headlights the Gould company placed tiny lamps, which added an almost startling touch of realism to the scene. The Packard company took advantage of its lighted headlights by placing over them "transfer" pictures of woodland scenes in which the central figure was a Packard car. The illuminated scene served well to show the attractiveness of the car in service and was an ingenious conceit which would show to advantage in any salesroom window.

Moving Gears Educate and Attract.

Never failing to prove educating to those who have an idea what a transmission looks like, but who are a bit vague as to just what is going on inside the case when the car is in motion are the uncovered gearcases wherein the gears are spinning in their thick and yellow baths of grease; a sample of this form of attraction was found in the booth of the Albany Lubricating Co., at the Garden, where a mirrored cover, uplifted, helped force the gear-churned grease into public view. Another exhibitor in a nearby space, the International Acheson Graphite Co., had upon its counter a miniature furnace which glowed with what apparently was an intense heat. Over the top of the furnace was sprinkled graphite, and a card explained that Acheson graphite is made in a heat of 7,500 degrees. Many show visitors put their hands over the furnace, but since a red electric lamp does not give 7,500 degrees of heat none was burned.

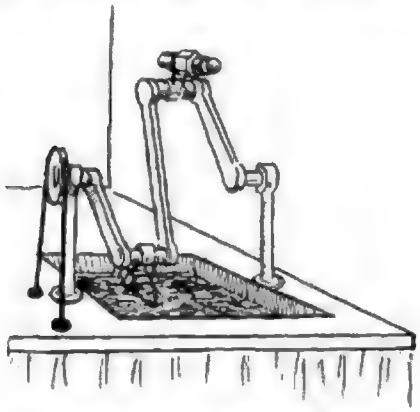
In the lubricating line the oil makers varied their methods of getting the public eye. The New York & New Jersey Lubricants Co., on the elevated platform at the Garden, used a device which is so special in construction that, unless it were furnished by the company it doubtless would not find its way to the dealer. It consisted of three sections of mirrored glass, one of which slid from the bottom to the top and bore the lower half of the word "Motorol." When this part was moved up in contact with the

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section which bore the upper half of "Motorol" the letters were about four inches high, and black. An electric mechanism, however, was so arranged as to cause the lower half to slide down, disclosing black stripes on a mirrored section underneath, making the letter 12 or 14 inches high. While the crowd was watching the completion of this transformation, the black stripes just disclosed were replaced by glass tubes containing various colored oils, and at this instant lights within the sign lighted and a pretty effect was produced; then the lights went out, the sliding glass moved up, and the performance was repeated.

Puzzle Interesting to Everyone.

A puzzle or a mystery always interests the crowd and George A. Haws, exhibitor of Panhard oils, took ample advantage of this fact. Also, his device was simplicity itself, being nothing more than an upright, L-



PLUGS THAT SPARKED IN WATER

shaped standard, from the arm of which was hung a half-gallon oil can, tipped at an angle of 45 degrees and the top cut out. Beneath this, upon a bench, was a five-gallon can, and a stream of oil poured continually from the upper into the lower can. Why the upper can never became empty was a mystery which caused a crowd to stand about the Haws booth. Many theories were evolved, but all were guesses; the solution was a little pipe which passed from the bottom of the lower can, down through the bench, up through the standard, through the leather handle which was riveted to the upper can and into the can. A little electric motor and a pump, concealed beneath the bench, did the rest, but to the public it was as mysterious as the first trolley car; they couldn't see what made it go.

The Oilzum people, White & Bagley Co., won attention by a wheel, the spokes of which were glass tubes, backed up by lights, the tubes being nearly filled with oil. The bright and varied colored spokes, with the bubbles rising as the spokes were inverted by the revolving of the wheel, proved interesting; as in practically all of the move-

ment devices, a small motor and belt actuated the wheel. The Havoline Oil Co. has a similar attraction.

Spark plugs are a never failing source of interest, and many exhibitors held throngs in front of their exhibits, watching wierd flashes within dark recesses. The majority of these displays consisted of a system similar to that which causes the timed sparks in

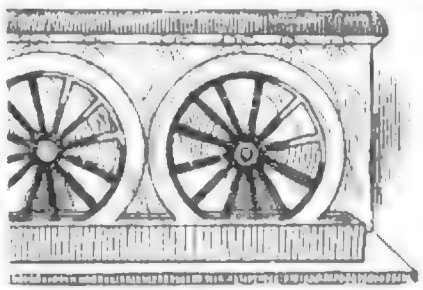


HOMO CARBURETTER DEMONSTRATION

a motor with the flashes in proper order. A. R. Mosler & Co. varied the arrangement by placing six mammoth Spitfire plugs, each about 15 inches long, upon their counter, the sparking ends toward the crowd, and these flashed intermittently, the size of plugs and sparks blocking traffic because of the unusual proportions. Big plugs, also, were shown by the Connecticut Telegraph & Electric Co. and the V-Ray Co., Inc., the latter's plug, which was about six inches in diameter, being made to spark despite a heavy coat of grease, which is highly nonconductive.

Devices that Played up Spark Plugs.

As in the V-Ray exhibits, there were numerous devices to show the ability of the



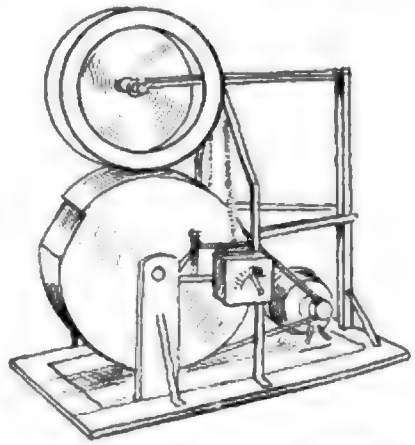
VALENTINE'S WHIRLING WHEELS

plug to spark under difficulties, the difficulty generally being a stream of oil pouring upon the plug which, nevertheless, kept up its "crackle." In some of these the oil was returned to the upper reservoir by a pump and in others an attendant returned it by hand when the lower receptacle became nearly full.

The Emil Grossman Co. utilized one of the best moving devices in the spark plug line; it consisted of two plugs, each attached to the throw of a two-throw crankshaft and wired to a magneto. As the motor which operated the magneto caused the shaft to revolve, the plugs dipped in a small trough of water, but each time came up sparking as busily as if nothing had ever happened.

Shock Absorbers and "Baby Dolls."

Shock absorbers always afford an opportunity for demonstrations, and both to draw attention and to tell its story the Hartford Suspension Co. displayed its famous "dancing dolls"—two miniature cars, one equipped and one not equipped with Truffault-Hartford shock absorbers, and in each of which was seated a doll. A motor caused drums to revolve beneath the car wheels, and what is likely to happen to the passenger in a car



BUMPING HOME NEWMASTIC ARGUMENT

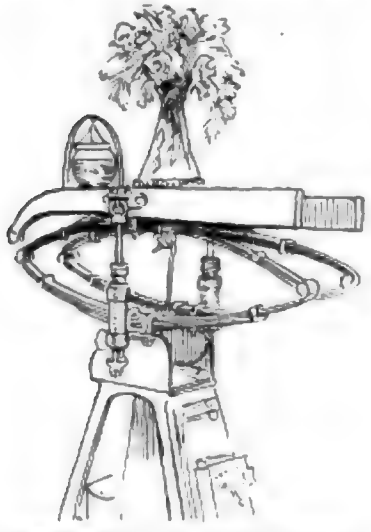
not equipped was hinted at in the way a doll in the unequipped car bounced and vibrated, while the doll in the other car had a comparatively easy time of it. This company also demonstrated its product by an automatic device which compressed and released an ordinary full-elliptic spring, the absorber stopping vibration at one time and the spring being free to vibrate at alternate times. The J. M. Shock Absorber Co. employed a somewhat similar device, except that there was but one car and it contained no dummy passengers, the absorbers being attached and then unattached to show comparative effects.

More cruelty to dolls was perfomed by the Gabriel rebound snubber. A car body, containing two dolls, was set upon a full elliptic spring which was compressed and released by a mechanism that also alternately attached and failed to attach the snubber. With the snubber not attached the dolls might never have returned to the car had not there been a connecting line between the seat of the car and the dolls.

Ernest Flentje cleverly drew attention to the ease producing qualities of his absorber

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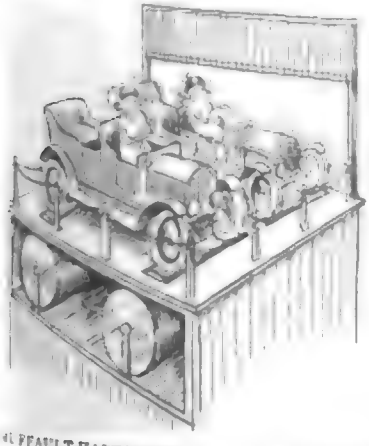
by placing a jar of goldfish and a bouquet of flowers upon a platform on top of a spring; a shock absorber was permanently attached, and when the spring was released after being compressed the bouquet and jar



"UNSHOCKED" FISH AND FLOWERS

of goldfish were not disturbed. In fact, the fish seemed to like it.

The John W. Blackledge Mfg. Co., to give a live demonstration of Velvet shock absorbers, attached one to a three-quarter elliptic spring, mounted the spring between two regulation wheels and revolved a drum underneath the wheels; and while a break in the surface of the drum made the wheels jump at every revolution, the shock



DEFFAULT-HARTFORD'S DANCING DOLLS

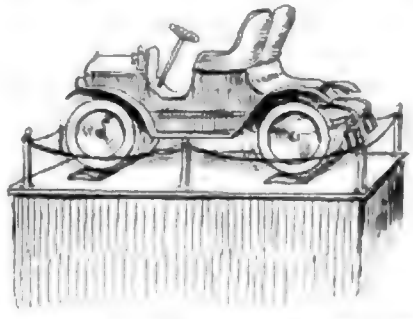
another convinced hundreds of people of the ability to take up the undue vibration.

Air and Filler Fooled the Crowd.

Tire filler could have nothing better done for it than was done by the Newmastic Co. The central portion of the device consisted of two wheels, the tire of one being filled with air and the other with Newmastic; the wheels were revolved by a notched drum and were made to carry a load in the shape of springs attached to arms extending from the outer hubs to a stationary post at the rear of the device and the passersby invariably stopped to guess which was Newmastic-filled and which was air-filled. Judging from the height of jump when the break in the drum hit the tires, vibration and general action, everyone guessed, and there were as many who guessed right as who guessed wrong. The action was almost identical with each tire, and the display did more than anything else probably could have accomplished in persuading the public to consider Newmastic as a substitute for air.

Carburetter Principle on Large Scale.

The Homo carburetter exhibit was calculated to explain how efficient is the little wheel which breaks up and vaporizes the gasolene that passes through this carburetter; up through the bottom of a black-lined box about five feet high, the front being open, projected a tube in which was



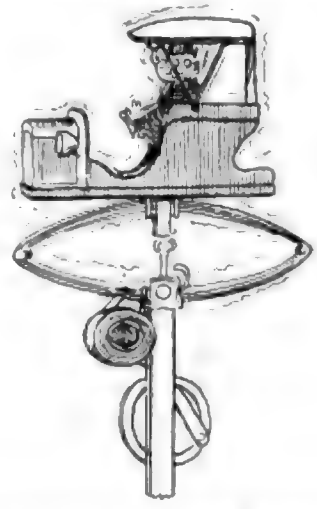
DEMONSTRATING J. M. SHOCK ABSORBERS

one of these little wheels, and water, "more difficult to vaporize than gasolene," as a salesman explained, was sent up into the box in a funnel-shaped cloud of vapor. Electric lights, set into the back of the box, made the vapor plainly visible, and for further effect the salesman held his hand in the cloud and it came out uniformly dampened. A motor underneath was the operating mechanism.

Enlarged Gauge that Taught Lesson.

Besides these, there were many clever publicity "stunts," among them being a big dial tire gauge, shown by the United States Gauge Co., the hand of which pointed, for instance, to figures which indicated that for a three-inch tire the pressure should be 60 pounds, dropped back to zero, pointed next to a combination of 3½ inches and 70 pounds and so kept on with its lesson. The Motometer Co., marketing a new device which attaches to the radiator cap and tells the car operator the temperature of the water, similarly used a big motometer in which a red liquid was made to rise and fall in the temperature tube by means of a motor and pump.

Tobin "Whichway" signals, in the basement, kept flashing "Stop" in red letters, and those who inquired were told that the signal beside the tail lamp lights when the pedals are operated for stopping the car. A revolving octagonal standard in the Goodrich booth turned first one line of sundries

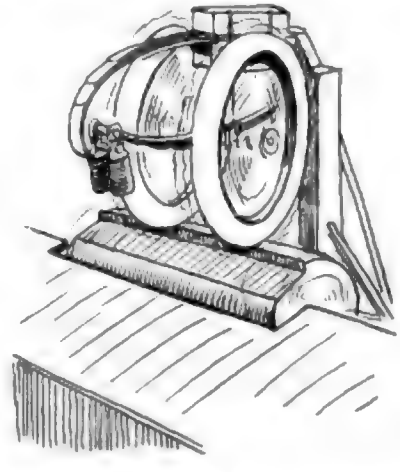


HOW GABRIEL DOLLS WERE "SNUBBERED"

or literature and then another toward the observer, and there were similar devices in other exhibits which, however, would have been doubly effective had there been something besides man power to turn them.

Showing How a Speedometer Works.

Odometers and speedometers in the Warner, Stewart-Warner, and Veeder exhibits



SHOWING ACTION OF VELVET SPRINGS

instructed the public in the internal workings of these more or less mysterious mechanisms and never failed to be observed; in the Veeder booth a revolving wheel caused a hub odometer to register, and in the Stewart-Warner six speedometers were kept running simultaneously, some sectional and others encased. In all of these the construction required was not difficult and, as usual, a motor did the work.

How better to demonstrate the fact that

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Valentine & Co.'s Vanadium varnish is not affected by soap than to revolve a wheel in a trough of soapy water, alternate sections of the felloe being coated with Vanadium and other varnishes? As might be expected, the Vanadium varnish came up bright and unaffected, while the other varnishes used contracted a bad case of bloom. The wheels, two being used, and a single card with a few words of explanation, told a better story than any salesman could have told to the show crowds—also they stopped to look and read, whereas they might have passed the salesman by.

Everyone likes to see a motor in operation, for many people do not know much about a car's "insides" and a number of car and motor exhibitors took advantage of their electric starting systems to show how power is transmitted to the rear axle, in some instances the chassis being jacked up from the floor and the rear wheels turning. Others showed separate motors turning and the Franklin company, a center of interest because of its air cooling, used a glass-hooded car with small windmills or pinwheels indicating the air currents.

One might not think that much movement or interest could be aroused by ball bearings, but the New Departure people proved otherwise; one of the engineers rigged up a number of small shafts, wheels and belts, and at one end of this power transmission chain placed a tiny electric motor and at the other end a section of shaft turning in bearings, the latter being exposed. Nothing in particular was illustrated except the fact that people will stop to look if for nothing more than just to see a few wheels go around.

Another meaningless but attractive layout was that of J. H. Williams & Co., who caused a six-cylinder crankshaft to so revolve that each time a throw came to the top it made a contact and lighted one of a row of different colored lights.

The king of the puzzle device group was that of the Link Belt Co., which had a number of gears and link belts running on a table and in front of the group a 2½-foot disk in which were inch slots. When this disk revolved at high speed an observer could see through it, but what he saw caused him to wonder if he saw aright, for while all the wheels and belts were spinning when not viewed through the disk, the view through the disk caused some to remain stationary, others traveled normally, and some went backwards. Such a device might easily be made by any dealer, and its installation in a window would necessitate little difficulty. Harold S. Pierce, the engineer who created it, said he got his idea from seeing one revolving electric fan through the blades of another, the second one appearing to be stationary.

MORE CARS, FEWER ACCESSORIES FOR CHICAGO

(Continued from page 27.)

Timken Roller Bearing Co., Canton, Ohio—Timken taper roller bearings.†

Tingley & Co., C. O., Rahway, N. J.—Vulcanizing outfits.

Tobey, Wm. L., Boston, Mass.—Q. D. rim removers and glare removers.

Tuttle Spring Co., Chicago, Ill.—Springs.*†

United Rim Co., Akron, Ohio—Standard universal rims.

U. S. Ball Bearing Mfg. Co., Oak Park, Ill.—U. S. ball bearings.*

United States Light & Heating Co., New York City—U. S. L. starting and lighting systems and storage batteries.†

United States Tire Co., New York City—United States tires.

Universal Tire Protector Co., Angola, Ind.—Tire protectors.*

Vacuum Oil Co., New York City—Mobiloils and greases.†

Vail-Osgood Rubber Products Co., Chicago, Ill.—Scientific inner tubes.*

Valentine & Co., New York.—Varnishes.

Vanguard Mfg. Co., Joliet, Ill.—Windshields.*

Veeder Mfg. Co., Hartford, Conn.—Veeder tachometers, odometers and die cast parts.†

Vesta Accumulator Co., Chicago, Ill.—Vesta storage batteries and lighting systems.†

Voorhees Rubber Mfg. Co., Jersey City, N. J.—Brown Scientific inner tubes.

V-Ray Co., Chicago, Ill.—V-Ray plugs.

Wallman Mfg. Co., Milwaukee, Wis—Oil tanks and storage systems.*†

Walpole Rubber Co., Boston, Mass.—Walpole tires.

Waukesha Motor Co., Waukesha, Wis.—Waukesha motors.*†

Warner Gear Co., Muncie, Ind.—Gears and parts and Gardner engine starters.†

Warner Mfg. Co., Toledo, Ohio—Gearsets.†

Warner Instrument Co., Beloit, Wis., Warner autometers.†

Weaver Mfg. Co., Springfield, Ill.— ———*

Weed Chain Tire Grip Co., New York City—Weed chains.†

Weston-Mott Co., Flint, Mich.—Axles and parts.†

Westinghouse Electric & Mfg. Co., Pittsburg, Pa.—Motors, starting and lighting outfits, vulcanizers, horns, etc.†

Wheeler & Schebler, Indianapolis, Ind.—Schebler carburetters.†

White & Bagley Co., Boston, Mass.—Oilzum lubricants.

Whitney Mfg. Co., Hartford, Conn.—Whitney chains.†

Willard Storage Battery Co., Cleveland, Ohio—LBA storage batteries.†

Williams Co., J. H., Brooklyn, N. Y.—Drop forgings and wrenches.†

Wolverine Lubricants Co., New York City—Wolverine lubricants.†

Sues Twice for Damage Claim.

Automobile owners are generally supposed to be the ones to worry in negligence litigation, but one instance, at least, where the complaining party found himself involved in still more trouble after the suit was terminated is contained in a suit brought in Des Moines, Ia., by Thomas Clancy against the Strong Motor Car Co. of that city. Clancy secured judgment for $1,800 for injuries sustained when one of the Strong cars struck him and now is suing to get part of this sum from E. J. Kelly, the attorney who conducted Clancy's suit.

Clancy claims he agreed to give the attorney one-third of the amount secured, while the attorney places the percentage at one-half and, however the deal was arranged, the attorney seems to have come into possession of the money; one point of difference is as to who received the $1,800 check. Clancy claims the lawyer received it and so arranged that he kept half of it, while the attorney alleges that Clancy received the check and turned $900 of it over to the attorney. Kelly also claims the suit is helped on by a grudge borne him by John Newburn, one of Clancy's attorneys in the latest suit.

Miller Evolves a Self-Healing Tube.

The next best thing to preventing a puncture is preventing the loss of air through a puncture, and it was with this in mind that Chas. E. Miller, of the Anderson Rubber Works, Anderson, Ind., devised an inner tube of the self-healing type, in which the pressure of air on soft rubber is made to close up holes.

The Miller tube consists of two concentric tubes of cured rubber, of the same kind as in ordinary tubes, with a space between them which is filled with plastic rubber, which is soft and more or less "tacky." The theory is that when a puncture occurs the air pressure, pressing the rubber, must force it into the puncture, filling it tightly, and that the rolling of the tire over the road increases this effect. It is said that as the layer of plastic rubber is completely enclosed and protected from the air, it will not dry out, but will remain plastic for the life of the tube. The Miller tube is considerably heavier than an ordinary inner tube, containing, the manufacturer states, about four times as much rubber.

Paris Finally Forbids the Cut-Out.

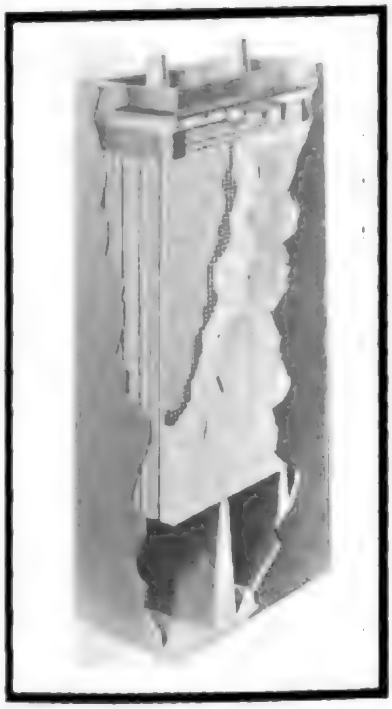
Following the example of other foreign cities, Paris at length has seen the light and henceforth the use of muffler cut-out in the gay city will be considered a misdemeanor.

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WILLARD RADICALLY REVISES STORAGE CELL CONSTRUCTION

New Method of Sealing, Eliminating Compounds, Adopted—Bolt Connectors Replace Burned Lead Straps—Other Changes.

As becomes the acumen of manufacturers who long since saw the light of necessity in the production of special types of storage batteries for automobile illuminating and starting, the Willard Storage Battery Co., of Cleveland, O., has developed and placed on the market a new type of LBA lead-plate vehicle battery the construction of which



HIGH "MUD" SPACE CELL

is so radically different from anything else of its kind as to mark it as one of the few really important improvements that have been made for a long time.

Disrupting more or less firmly rooted battery traditions which have remained in marked contrast to the modern tendency toward simplicity of construction and accessibility, the Willard company, figuratively speaking, has taken the bull by the horns, and bodily cast out sealing compounds and "burned" connections, the net result of the innovation being that the "insides" of the new batteries are infinitely more "get-at-able" than were the "insides" of their predecessors. Instead of the old-style sealed cover, sealed with a black mass which becomes hard only when cold and is semi-fluid when heated, the new cells are sealed with soft pure rubber gaskets and "burned" connectors have given way entirely to an entirely new type of bolt connector.

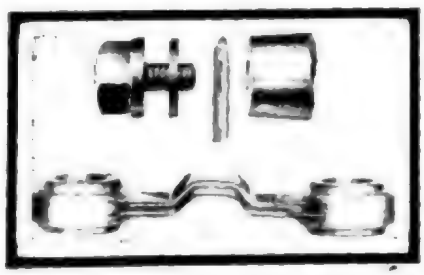
Some idea of the greater simplicity and accessability of the new LBA cells can be gained by the ease with which it is possible to remove one or more units for repair or replacement, or to remove the whole internal economy for washing. By simply removing the bolts, the cell connectors are



RUBBER SEALING GASKET

released, releasing in turn the covers and soft rubber gaskets, which then may be lifted out, giving quick access for the removal of the cells. Under the old regime when it became necessary to remove one or more cells for equalizing or repair—an operation which is not the least bit uncommon—it was necessary first to dig out the sealing compound—a more or less laborious and dirty job—and then to break the lead connectors in order to release individual cells; of course, if all the cells were to be removed it was necessary to sever all the connectors either by sawing, which is the preferable method, or by melting. From which the simplicity of the new construction becomes apparent.

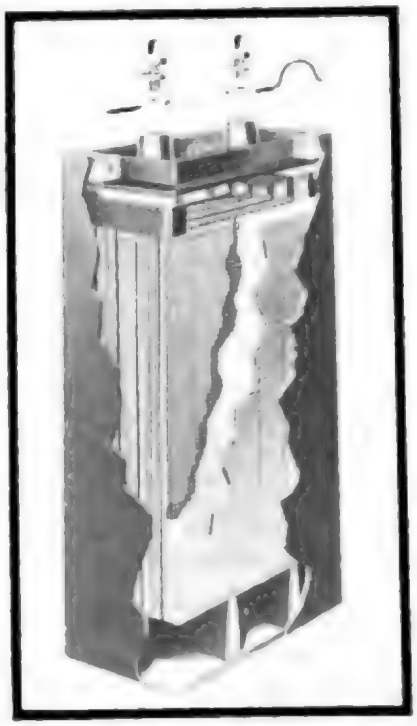
Among other improvements which have



NEW LBA CELL CONNECTOR

been made simultaneously with the adoption of the new method of sealing and connecting, a new type of vent plug has been adopted. It is built upon scientific principles calculated to cause the condensation of liberated gas before it escapes, by breaking the bubbles. Jars are built with heavily reinforced walls to ensure against breakage and are constructed with both standard and deep "mud" spaces. Reflecting the experience of 20 years in the building of vehicle batteries, the plates remain substantially the same and are constructed under processes calculated to make them peculiarly suitable for vehicle work.

In common with a number of other manufacturers, the Willard company supplies its batteries in a number of different types, which vary according to the work for which they are intended. Types J and K of the LBA vehicle batteries, for instance, have heavy plates of standard thickness, such as at first were designed for electric vehicles, and have remained standard for the past 14 years. Cells are made up containing from five to 21 plates, according to the desired capacity, and for those who still adhere to conservative lines the old-style compound sealed covers and lead connectors are supplied; needless to add, both



SHOWING BOLTED CONNECTORS

types also are supplied with the new style rubber seals and bolt connectors.

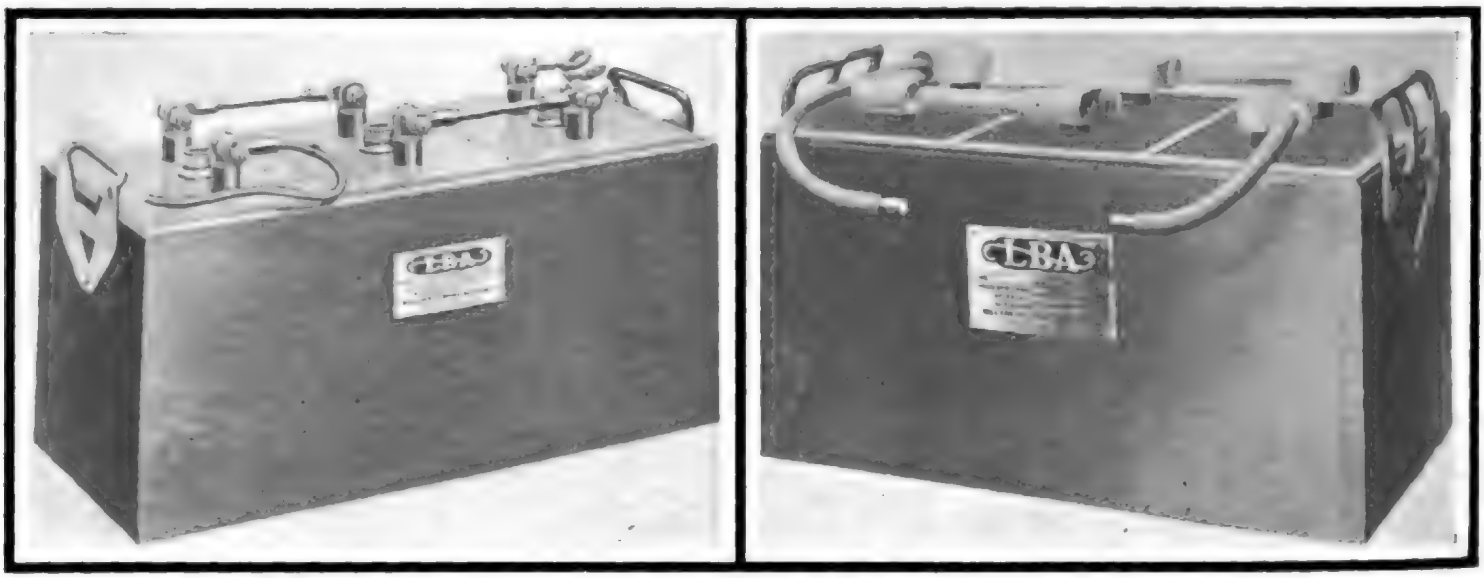
Permitting greater capacity for the same bulk, types L and M are supplied with medium thickness plates, there being from seven to 23 to the cell. In common with all the others, they are made with both high and low "mud" spaces, the former being calculated to live out its useful life without the necessity for washing by reason of the greater room for sediment at the bottom of the jars. Types N and O contain very thin plates ranging in number from seven to 27, and are designed primarily for use where light weight and great capacity are required, as for instance, in pleasure vehicles.

In the production of batteries intended for lighting and starting work, there are several important characteristics which must of necessity be incorporated in design, and among them high voltage maintenance,

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slow temperature rise and the ability to maintain output for protracted periods stand one, two, there, respectively. Simplicity of construction and accessibility also are essentials, of course, and it is to all these points that the Willard company draws attention in bringing to public notice the special types of batteries that have been developed for this class of work, experimentation having covered a period of more than five years.

By reason of the fact that lighting and starting batteries generally are expected to withstand unusually hard service and real abuse at the hands of those who are not as familiar with batteries as they might be, Willard batteries are built on the individual cell principle, thus permitting the inspection or repair of one cell of a battery without the necessity of disturbing the others. Further increasing accessibility, all cell connectors are made above the top cover, which construction also operates to reduce to the minimum the possibility of local action between cells. And as there are no exposed parts which can corrode, cleanliness is an inherent feature of the line. The principal characteristic of the starting battery is high efficiency and low internal resistance, with corresponding high voltage when discharged at high rates in order to permit the realization of maximum motor torque.



LBA BATTERIES THAT HAVE BEEN DEVELOPED ESPECIALLY FOR STARTING AND LIGHTING SERVICE

Britishers Begin Study of Benzol.

Aroused at last by the British clamor for benzol in place of "petrol," the price of which steadily is mounting, the Royal Automobile Club has joined forces with the motor Union and the Society of Motor Manufacturers and Traders in the formation of a commission to study and investigate more thoroughly the question of the suitability of the alternate fuel. As is fairly well known, benzol is a coal tar product that on more than one occasion has been suggested as the best means of bringing the gasolene barons to their senses. The work of the commission will be commenced immediately.

Carburetter "Coughs" Caused by Water.

Straining the gasolene may take all the water out of the gasolene, and usually it does so, if a chamois is employed; but nevertheless water not infrequently will come out at the carburetter end of the feed pipe. The reason for this, according to the Rayfield people, is that moisture in the air condenses inside the tank and the water naturally seeks the lowest point in the system—the carburetter intake—and, getting into the carburetter, causes "popping" that often is taken as an indication of too lean a mixture. But the reason is that the carburetter has attempted to handle a little water as it would handle gasolene, and the result is a "cough" or two, after which the engine runs normally till another drop of water provokes more "coughing." The remedy is a separator in the gasolene line.

Frenchmen Evolve Air Transmission.

"The world do move," as some one or other has remarked, though whether it ever will move fast enough to see the adoption of the compressed air transmission remains to be seen. Suffice it to say that the last one seen on American shores was up to its hubs in a beautifully sandy back yard, where it had been abandoned as impracticable after something like $18,000 had been spent in developing it. Despite the difficulties besetting those who attempt such a radical means of eliminating, at one fell swoop, clutch and gears and a whole lot of other parts, however, two Frenchmen, named Personne and Persin, have built such an air transmission, and they are exceedingly sanguine of its possibilities.

In the Personne-Persin arrangement, a special motor has been made with three power cylinders and three air cylinders cast together in pairs in V form. The air engine consists of four vertical cylinders mounted directly on the front axle, which serves also as the crankshaft for the air engine, which therefore is direct connected; speed changing is effected by varying the speed of the compressor, and a large tank is provided for the storage of air under pressure that the whole arrangement may be made "self-starting." Carrying the idea a little further than any of their predecessors, Messrs. Personne and Persin utilize the heat of the exhaust to expand the stored compressed air, thus increasing efficiency slightly.

Fan That Both Cools and Brakes.

Applying a fan brake in a manner that might cause some engineers to open wide their eyes, a firm of foreign car makers which supplies commercial vehicles designed for use in the passes of the Alps mountains, has achieved a wonderful method of construction for which great efficiency claims are made. By way of providing retarding influence to prevent trucks running away with themselves on the steep mountain roads, and also to keep the ordinary brakes and the differential mechanism cool under the strain of continual braking, a big fan brake connected to the propeller shaft is located beneath the chassis and rotating parallel to it. Putting the fan in motion with the aid of a hand lever causes a great displacement of air thus considerably retarding the vehicle. And as the current of displaced air is directed against the wheel brakes, two birds are killed with one stone, so to speak.

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ELIMINATING TROUBLE IN LIGHTERS AND STARTERS

Necessity for Cleanliness and Periodic Inspection if Petty Annoyances Are to be Obviated—Value of Systematic Search in Locating Cause of Failures—Leece-Neville Apparatus as an Example.

(This is the seventeenth of a series of articles designed to make clear the electric lighting and engine starting systems in use and to render easier their care and repair by the dealer and owner alike.)

"Here," said the enthusiastic owner, "is an electric lighting and engine starting system that I have had for a little over a year; it has always worked well and smoothly, has never failed to start the engine and there always has been plenty of 'juice' in the battery to light the lamps. Within the past week, however, it seems to have gone wrong, somehow or other: I can't get enough light out of the lamps to placate the police—it's the kerosene burners that have spoiled the lenses and reflectors up a bit—and the starter gives a most extraordinarily feeble 'kick' when I try to start. Altogether, it appears pretty sick; what's the matter with it?"

Dirt That Causes Much Trouble.

It did not take the repairer very long to discover that both the generator and the motor were dirty—very dirty indeed—that both were mud-splashed, that there were a couple of loose wires and that the commutators were so caked with a combination of oil and carbon dust and ordinary dust that it was almost impossible to distinguish the segments from the insulation. It took several hours and cost in the neighborhood of two dollars to put the equipment in running condition again and, of course, the owner grumbled at the expense. He had been told to let it alone and he had done so, and he could not see why he should be expected to foot the bill.

And yet he had been very careful to see that every other part of the car was cleaned every night—one little spot of mud on the body would result in cause for the washer to detail. The engine was religiously oiled and at least once a week it was gone over with a cloth to remove the most conspicuous portion of the accumulated dust and the grease cups were filled and screwed down at regular intervals. If the engineer of an express train upon which he was riding had failed to use his oil can and the train had been delayed half an hour or so to permit a hot bearing to cool, he would have felt like suing some one. As a matter of fact, the wheels of some locomotives make more than 400,000 turns in 24 hours, but they are oiled and looked after every three or four hours at the outside; and yet, when the manufacturer of electric lighting and engine starting equipment mildly suggests that his apparatus requires a certain amount of care—which, it ought to be understood, is not included in the injunction to let it alone—the advice is likely to be looked at askance. And if it does break down for the reason that it has been too assiduously let alone, and the attention of a repair man is necessary, the manufacturer unjustly is liable to be viewed in the light of the plumber of joke fame.

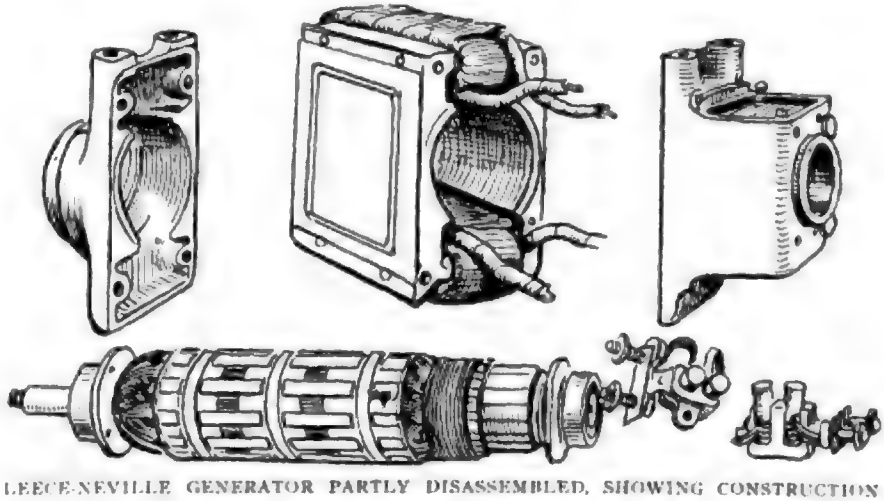
Increasing the Starter's Efficiency.

Periodic inspection, which in the majority of cases can be taken to mean intelligent care, for other than an occasional cleaning and oiling nothing else is required, is absolutely essential if real satisfaction is to be expected—all of which and a great deal more has been made plain in the preceding sixteen articles which have appeared in Motor World; unless the owner is willing to soil his hands occasionally and to exercise his own good judgment in caring for his system, he may well expect that a visit to the repair shop eventually will be necessary, for no piece of mechanism, no matter how good it may be, can be expected to operate indefinitely without any attention whatsoever.

Incidentally, because a new engine as it comes from the factory is "stiff," it should not be expected that an engine starter will work quite as efficiently at first as it will after the engine has been run two or three hundred miles and its bearings have become smoothed down, though it is only fair to add that in few cases is trouble of the kind experienced. Still, thorough investigation of the cause of failures or sluggish action should be made before the system is condemned on general principles.

All of which leads to the thought that there are many ways in which the efficiency of an engine starter may be increased quite easily. The first of these is to make certain that the carburetter is performing its allotted work properly and is not "loafing on the job." Where no engine starter is used, the amount of human exertion required to start a motor may serve as a fairly accurate gauge of the adjustment of the carburetter for starting, and cases are many where failure to start on "one pull-up" has resulted in the adjustment being changed, to the mutual advantage of the owner and the gasolene tank.

Quite naturally, if an engine is hard to start—if it requires that the engine starter be operated several minutes before the pistons can be induced to commence their labors on their own account—an excessive drain on the battery takes place. Though most of the engine starters on the market will "spin" a heavy motor for almost an hour, which is to their credit, they are not expected to do so by the manufacturer, whose allowance is for but a momentary use of the electric motor at comparatively long intervals. Frequent starts requiring several minutes—one man confesses that often it



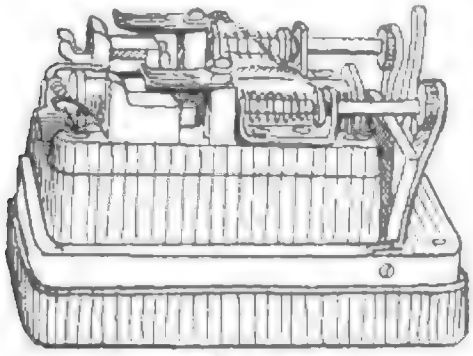
LEECE-NEVILLE GENERATOR PARTLY DISASSEMBLED, SHOWING CONSTRUCTION

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requires as many as ten minutes to start his engine deplete the battery very quickly, for it should be remembered that the starting motor draws anywhere from 100 to 150 amperes of current every time the engine is started under normal conditions. Where conditions are abnormal, such as are caused by improper carburetter adjustment, or stiff bearings, the current may be, and generally is, considerably greater.

How Adjustment Helps Operation.

Improper carburetter adjustment is the most frequent cause of hard starting, though defects in the ignition apparatus may cause quite as much trouble. Spark plugs in which the gaps are too wide probably cause as much trouble, though it should be remembered that weak batteries also are frequent offenders. Of course, where ignition current is drawn from the same stor-

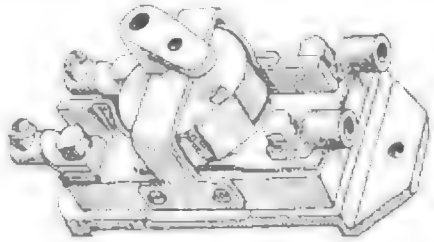


CUT-OUT IN DETAIL

age battery that feeds the lamps and the starting motor, battery trouble is unlikely, unless the battery has been permitted to exhaust itself, though even then there generally will be enough current to start, provided there is enough to operate the starter.

With a great many systems, the condition of the battery may be judged by means of the ammeter which forms part of the equipment; incidentally, the meter can be relied upon as an infallible tell-tale to indicate whether or not the dynamo is generating and whether it is properly connected to the battery through the cut-out. Because it seldom is used as other than a plain tell-tale, there being very few operators who can read an ammeter intelligently and realize the meaning of the reading, and because there is no real necessity for a meter which may or may not increase complexity, several makers have substituted for it an indicator which operates on the principle of an annunciator. Among them, the Leece-Neville Co., whose equipment is used on Haynes cars and a number of others, has adopted an indicator which is unusual in that it combines the functions of a tell-tale with those of an automatic cut-out. The remainder of the Leece-Neville system is of the two unit type, in which the generator and the starting motor are separate machines.

Despite the apparent complexity of the combined indicator and cut-out suggested by the designation, it really is a very simple device, as may be seen by the accompanying illustration, and there is nothing in it that need ever require adjustment. As a matter of fact, it may be placed on the dash, which is its logical location, and left severely alone, the arrangement of the con-

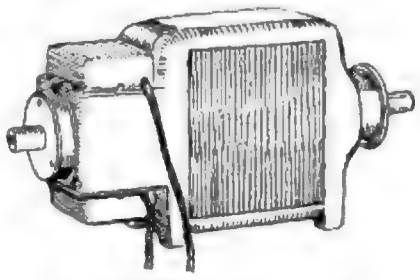


STARTING SWITCH

tacts being such that practically no wear can take place and perfect electrical connection is ensured for the life of the mechanism.

Annunciators Instead of Meters.

In its essential elements, it consists of a U-shaped magnet with the energizing coil contained within the arch of the U; the armature is hinged at one end and the other end is extended to form two "legs" which press against two spring-returned plungers carrying contacts; the other contacts are stationary, of course. A third "leg" between the other two serves to actuate an arm carrying the indicator, which is inscribed with the two words, "Off" and



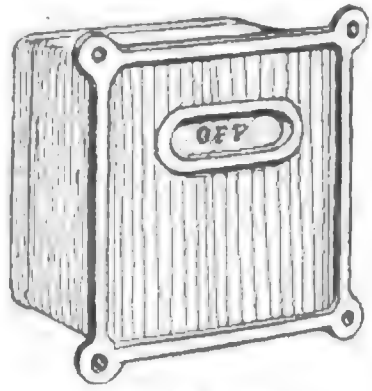
LEECE-NEVILLE DYNAMO

"Charging." In the illustration, the "target," as the indicator is styled, has been omitted for clearness in showing the remainder of the mechanism.

In the design of the system, it is provided that the generator shall commence to charge the battery immediately the car speed reaches 10 miles an hour on high gear. Consequently as soon as the current generated by the dynamo is greater than the battery current, which is necessary in charging, the cut-out automatically closes, and, in closing, shifts the "target" so that the word "Charging" appears in the little window in the case. The case, by the way, is completely water- and dustproof, though, as so often has been remarked, it is practically impossible to exclude all dust, despite the greatest of care in workmanship; a certain amount is bound to find its way into the mechanism after a time, because of vibration and, needless to add, it should be removed, the preferable method being by means of a soft camel's hair brush.

Cleaning the Cut-Out Mechanism.

In cleaning the case, however, great care must be taken not to bend the movable contacts, which are slotted to give them springiness and ensure perfect connection. If either one of them becomes bent so that it does not make contact, the device will remain inoperative until its shape is restored. Although the possibility is remote, either of the plungers may stick in its bear-



CUT-OUT CASING

ings, due to the presence of dirt, which makes plain the necessity for cleanliness if trouble is to be avoided. To obviate sticking, it is not permissible to lubricate the guides, for the reason that the lubricant is likely to work more harm than good by causing accumulations of dust. The movement of the contacts is small in any case and the better way is to dust out the case regularly.

As for the contacts themselves, they should never require to be touched, unless, of course, oil has been permitted to get on them, or foreign matter has caused corrosion which prevents proper connection being made. Under such conditions, the remedy suggests itself and consists of a light application of fine emery cloth, until the contacts are uniformly bright. Incidentally, even though the latitude of movement of the contact arms is very small it may be sufficient under the action of continued vibration to loosen some of the wires. Hence it is always a good plan to examine connections when it becomes necessary to open the case for any reason.

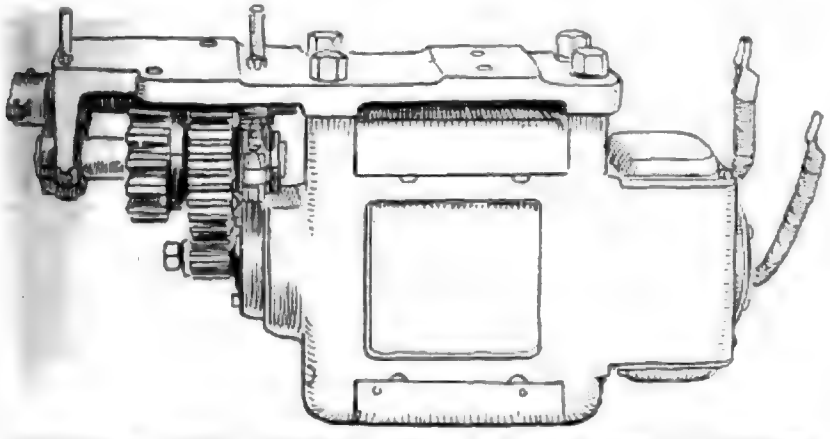
In the event that wires have jarred completely loose from their binding screw which, though unlikely, still is possible, the greatest of care must be taken to see th

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they are properly replaced, for there is nothing that is calculated to cause more trouble than misplaced wires. In common with a great many other manufacturers of such apparatus, the Leece-Neville company supplies a comprehensive instruction book with its equipment, and in the book there are given diagrams of all the wiring. Hence, it should be a comparatively simple matter for even the veriest novice to replace wires as they should be replaced using the diagrams as a guide.

Wiring Simplicity Made Plain.

The wiring of the remainder of the equipment not contained in the circuit breaker casing is a good deal simpler than might be supposed. The battery is rated at 100 amperes capacity and consists of six cells



LEECE NEVILLE MOTOR, SHOWING METHOD OF ATTACHMENT AND GEARING

connected on a three-wire system, so that they are charged in series at 12 volts. The lamps are connected on two circuits of six volts each, splitting the battery and the lighting load into two equal parts, and the starting motor operates at 12 volts. Omitting the wires that lead to the lamps, there are only two in the system. They lead from the generator to the battery through the automatic cut-out and from the battery to the starting motor through the starting switch.

The starting switch itself is a very plain and rugged piece of mechanism with big, substantial contacts, as becomes a device calculated to handle very heavy currents. The movable member is circular and when rotated slides two contacts against two others mounted on the base, the arrangement being such that when the central piece is fully rotated, the surfaces in contact are of unusually large area. By reason of the sliding contact obtained, there is no possibility of foreign matter lodging in the mechanism and preventing proper connection being made, hence no trouble from this source can be expected. Also, as the parts all are heavy and strong, it is extremely unlikely that anything short of collision disastrous to the rest of the car could put it out of commission. The only trouble that might affect the device and prevent the starting motor from being operated would be the loosening of the connecting wires. From which it appears that wherever possible the wires should be soldered in place.

Motor and Generator Care Explained.

Except for a difference in the method of wiring, the generator and the motor are exactly like in construction and appearance. The motor is of the plain, series-wound type in which the torque increases with the load up to the point of stalling. That is to say, the greater the load placed on the machine, within prescribed limits, of course, the greater will be the pull exerted. To make it still plainer, if the gasolene motor is very hard to "turn over," the electric motor will work harder to turn it over than it will work if the operation is easier and, of course, it will consume current proportionate to the work performed. Regulation of output is an inherent function of the generator and is obtained by the method of winding; it is not dependent upon any external electrical, mechanical or electro-mechanical devices.

Of these two elements—the motor and the generator—the motor practically can be forgotten from the beginning of the season to the end, for there is only one moving part in it, it is used comparatively little as compared with the use the generator gets, and consequently is very much less liable to derangement of any kind. It should not be forgotten, however, that cleanliness is next to efficiency—to paraphrase a much-worn proverb—and even though the casing is as dirtproof as it is possible to make it, dust will work in. The dust itself will do little harm provided the machine is not flooded with oil, though obviously it is better out than in. As the commutator shaft rotates in ball bearings, a few drops of fine machine oil about once a month will be all that is required.

The generator, of course, is another proposition, for it is in use continually and is subjected to many times as much wear as is the motor; it should be lubricated a little more liberally, or, rather, a little more frequently—say, twice a month instead of once a month, if the car is driven continually. Also, as the generator is run continually, as long as the engine is run, it will require cleaning more frequently than will the motor, for the reason that the brushes will wear more rapidly and cause a certain amount of carbon dust. The cleaning should be done preferably with a soft brush, provided the dust is not caked on the parts with oil when a cloth dampened, but not wet, with gasolene can be used to advantage. In both the motor and the generator a removable plate over the brushes is provided for inspection of the "works."

Commutator and Brush Attention.

As the armature shaft of the generator runs in ball bearings, the only parts which will show wear eventually will be the brushes, though there is no reason why they should not last at least a season without replacement unless gritty matter has been permitted to find its way into the casing. Under such conditions, however, the commutator is far more likely to show the effects of wear, apparent in scratches or a too bright condition of the surface. Persistence in the use of very fine sandpaper —No. 00—applied while the armature is rotating and after the brushes have been removed will remove scratches from the commutator and restore it to its original condition, provided too much force is not used and the sandpaper continually is moved longitudinally. If too much force is exerted, or the sandpaper is not moved, scratches worse than those it is sought to remove will be the result. After the commutator has been brought to a perfectly smooth surface, a minute quantity of the best quality vaseline applied with a small piece of felt will assist in preserving its finish. Before the brushes are replaced, their ends should be gently sandpapered, care being taken not to disturb the curvature if possible.

If inspection shows the commutator to be smooth, with a high, brownish polish, it should not be touched, for it then is in the best of condition and can be expected to run indefinitely without attention. If it is caked with dust and oil, however, and appears very sticky, the accumulation should be removed with sandpaper applied in the same manner as in removing scratches. As has many times been pointed out, emery cloth never should be used for the purpose, as minute particles of the emery are likely to become imbedded in the comparatively soft coppper and work havoc with both the commutator and the brushes.

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MILWAUKEE DEALERS HAVE ONE SHOW INSTEAD OF TWO

Differences Are Adjusted and Combined Efforts Bring About Successful Exhibition—The Cars and Their Exhibitors.

That in unity there is strength amply was demonstrated at the fifth annual show of the Milwaukee Motor Show Association, working in conjunction with the newly organized Milwaukee Progressive Automobile Dealers' Association, which held the boards for a full week, from Saturday, January 11th, until Saturday, January 18th. The concentration of the efforts of the two organizations on the production of a single show instead of upon two separate exhibits, as was first proposed, resulted in a display which filled to the limit each of the four halls which comprise the Milwaukee auditorium building. Of pleasure cars the products of 68 factories were exhibited by 47 dealers, and in the basement were staged the wares of 14 different makes of commercial vehicles shown by as many dealers. Part of the main hall space was given over for the exploitation of the wares of some 18 accessory dealers.

Decorations were simple but effective. Huge gray tinted pillars with gold captions supported mammoth palms on either side of the aisles and the intermingling of the leaves formed a canopy which covered the passages. Over the booths an arch trellis work bent under the weight of the southern smilax and tree moss with which it was entwined; myriad incandescent lights were disposed to advantage in the foliage. Green, gray and gold were the predominating colors in the draperies. The exhibitors of pleasure cars were:

Wolaeger Auto Sales Co., Studebaker; D. Wittenberg, Carter Car; Packard Motor Car Co., Packard; Cole Motor Car Co., Cole; H. G. Hafemeister, Staver; Oakland-Wisconsin Co., Oakland, Detroiter, Empire; Emil Estberg, Pope-Hartford, Woods electric; Anger Engineering Co., Anger; Wisconsin Auto Sales Co., Herreshoff, Little, Cutting, Chevrolet; American Automobile Co., Pierce-Arrow; Bleinheim Garage, Velie; W. E. Allen Co., MacFarland, Marathon; J. C. Coxe, Stanley; R. C. Rockstead, Warren and Paige; Regal Auto Sales Co., Regal; Archambault Sales Co., Lozier Michigan; Schreiber-Boorse Co., Locomobile, Hudson; Winton Motor Car Co., Winton; E. B. Leverenz, Elmore, Pullman; Mitchell Automobile Co., Mitchell; Kopmeier Motor Car Co., Fiat, Baker electric; E. F. Sanger Co., Marion, Stearns-Knight; Smith-Hoppe Auto Co., R. C. H., Detroit Electric, Chalmers; M. C. Moore, White; Boulevard Automobile Co., Nyberg; Curtis Automobile Co., Reo; J. I. Case Automobile Co., Case; Frank Thompson, Apperson; J. H. Menhall, Abbott; First Avenue Garage, Metz, Davis; Jackson Motor Sales Co., Jackson, Hupmobile; E. H. Peshak, Enger; Krit Motor Co., Krit; E. O. Morse, Crawford; Jonas Automobile Co., Cadillac; Thos. B. Jeffery Co., Rambler; Gas Power Engineering Co., Premier; Kissel Kar Co., Kissel Kar; George W. Browne, Overland, Stutz; Buick Motor Co., Buick; Hickman-Lauson-Diener, Ford; Esbenshade & Teague, Waverly electric; Hustis Bros., Stevens-Duryea, King, Borland Electric; H. Grede, Pathfinder; Imperial Motor Sales Co., Imperial; Hughes-MacDonald Motor Co., Garford, Ohio electric.

The exhibitors of commercial vehicles were: Kubal & Schauer, Commerce; Curtis' Auto Co., Reo; Chase Motor Co., Chase; Schreiber-Boorse Auto Co., Locomobile; International Harvester Co., International; Buick Motor Co., Buick; Crown Commercial Car Co., Crown; G. W. Browne Co., Overland; American Automobile Co., Pierce-Arrow; Stegeman Motor Sales Co., Stegeman; Packard Motor Car Co., Packard; Kissel Kar Co., Kissel Kar; Sternberg Mfg. Co., Sternberg; A. McDougal, June.

Accessory exhibitors were: Aermore Mfg. Co., Auto Specialty Co., Wallman Mfg. Co., Auto Supply Co., P. Gross Hardware Co., Feilbach Motorcycle Co., O'Neil Oil & Paint Co., Meile-Blumberg Co., Kemlee Co., General Welding Co., Wadhams Oil Co., Western Fixture Co., Johns-Manville Co., Comet Motor Co., H. D. Plimpton, Milwaukee Rubber Co., Pyrene Co. of Illinois.

Native Dressing for Lynn Display.

With true local pride, the Automobile Dealers' Association of Lynn, Mass., did not go outside of its own State in an endeavor to procure decorations suitable to form a picturesque setting for its second annual show, which held the boards in the State Armory during the week ending Saturday last, 25th inst. Native fir trees, suitably arranged, comprised the decorative scheme. Both pleasure and commercial vehicles, products of 30 different factories, were on view until the doors closed on the exhibit. Fourteen dealers exhibited.

Among the exhibitors were: Seymour Avenue Garage, Inc., Mitchell, Detroiter and International commercial; S. P. Tierney, Buick; Liberty Garage, Hudson and Studebaker and White and Chase trucks; Essex Automobile Co., Flanders, Hupmobile, American, Peerless and Hercules trucks; Eastern Avenue Garage, Ford; M. Plumstead, Maxwell, Stoddard-Dayton, and Columbus electric; P. I. Reynolds, Oakland and Michigan; Fred C. Mitchell, Stevens-Duryea; F. E. Vallier, Velie; E. T. Reynolds, Pope-Hartford; L. D. Robbins Co., Cadillac and Winton; H. M. Jacobs & Son, Pathfinder; E. L. Brown, Mitchell, Abbott-Detroit and Krit; Henry C. Durgin, Jackson.

Importers Part of Philadelphia Show.

In an Italian garden setting that was nothing if not befitting, for cars of foreign manufacture were predominant, the Philadelphia Automobile Board of Trade closed its first annual show in the First Regiment Armory, Saturday evening last, January 25th. In all, there were 20 different makes of motor cars exhibited by 16 dealers, and of that number nine were New York importers who exhibited their automobiles at the recent Importers' Salon in New York City from January 2nd to 11th. The others were Philadelphians who held no excess of brotherly love for the Philadelphia Automobile Trade Association, whose show was in full blast in another building.

The list of exhibitors includes: Tioga Automobile Co., National, Nyberg and Hupmobile; Abbott-Detroit Sales Co., Abbott-Detroit; B. H. Kirkbridge, Cutting; Boulevard Garage & Sales Co., Little and Chevrolet; Mercedes Distributing & Importing Co., Mercedes; Isotta-Fraschinni Motor Co., Isotta-Fraschini; F. W. Sewell, Minerva; W. C. & H. N. Allen, Metallurgique; De Dion-Bouton Selling Branch, De Dion-Bouton; Adams-Lancia Co., Lancia; Keeton Motor Co., Ltd., Canadian Keeton; Renault Freres Selling Branch, Renault; Panhard & Levassor Selling Branch, Panhard; L. E. French, Kline and Marathon; Charles R. Taylor, Warren; Frank Parks, Schacht.

Waterbury's Second Exhibit Under Way.

Mayor Francis T. Reeves of Waterbury delivered the speech of welcome which marked the opening on Monday evening last, January 20th, of the Connecticut city's second venture in the show field. As was the case last year, the show is staged in the Auditorium by the Waterbury Automobile Dealers' Association; the doors will swing wide until Saturday evening next, February 1st. The decorative scheme, which embraces the profuse use of tinted bunting and potted plants, is simple in the extreme, which adds rather than detracts from its effectiveness. On the floor are 18 different makes of pleasure and commercial cars, shown by 12 dealers; accessories are displayed by half a dozen sundry dealers. The cars shown are:

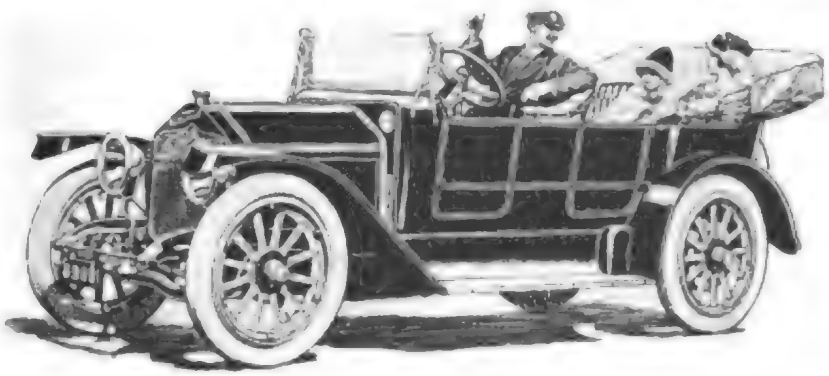
Little, Chevrolet, Reo, Overland, Ford, Jackson, Locomobile, Buick, Pierce-Arrow, Metz, Studebaker, Packard, Peerless, Broc Electric, Chalmers, Universal, Moyer, and Stutz.

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Stock Champion *International Champion*

National 40

Improved Series V $2750 to $3400 Five Models



A Work of Art

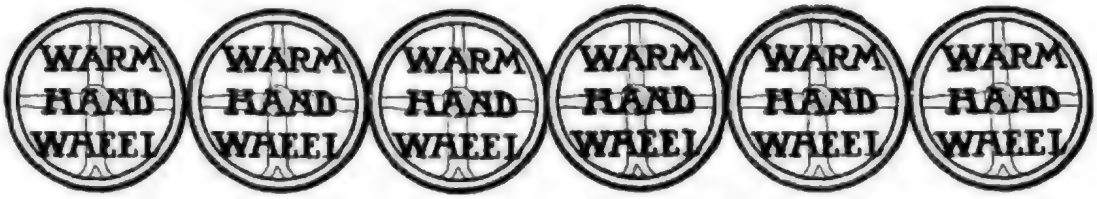
ARTISTS add rare beauty and luxury to your National car after the mechanical engineering experts have perfected its power, reliability, ease of control, and serviceable qualities.

For luxury and utility you find the National the criterion.

Long stroke motor (4⅛ x 6), left-side drive, center control, Gray & Davis electric starter, Gray & Davis dynamo electric lighting system, Bosch double dual magneto, multiple jet carburetor, 12-inch Turkish upholstery, tire pump integral part of motor, 128-inch wheelbase, Hoffecker speedometer, full floating rear axle, concealed baggage compartments, tire carriers, full heavy nickel trimmings, powerful brakes, perfect oiling system, robe rail, foot rest, foot mat in running board, concealed tool box, electric horn, top, curtains, Truffault-Hartford Shock Absorbers in rear, adjustable ventilating and rain vision windshield and one extra Firestone demountable rim.

National Motor Vehicle Company, Indianapolis, Indiana

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Be a Warm Hand Wheel Dealer

Every week you wait you are missing sales—the weather is here—the desire for comfort is ever present with those who do winter driving for business or for pleasure. Are you catering to demand for Warm Hand Wheels—or are you still waiting?

Here is a new but plainly practical device which keeps cold hands warm under all conditions of cold, rain, sleet and wind. It is simple, easily installed, easily controlled.

The Warm Hand Wheel is not a luxury. It is a necessity on every car that operates between October and May. Its price puts it within the reach of every car owner—and you will find it a ready seller in your territory.



Circuit Open



Circuit Closed

The Warm Hand Wheel is heated by the current from storage batteries or electric lighting systems. Ford owners will find the "built in" flywheel magneto ideal for the purpose. In all cases, a very small amount of current is used.

Dealers who see the future as well as the present of this common sense, comfort-giving device, are getting their territory. It's right up to **you** to get into touch with us now. Write and get the details—learn how liberal your profit will be on each fifteen dollar sale.

Warm Hand Steering Wheel Co.

527 Fifth Avenue **New York**

Storage Batteries
At the New York Show

Of 277 Cars

Furnished With Electric Lighting and Starting Equipment

188 Contained

BATTERIES

while the balance, 89 cars, or 32 1-10 per cent., contained batteries produced by no less than four manufacturers.

When You Use Batteries You Are With the Big Majority

Use Class A Battery with an Electric Lighting Generator
Use Class B Battery with an Electric Self-Starter

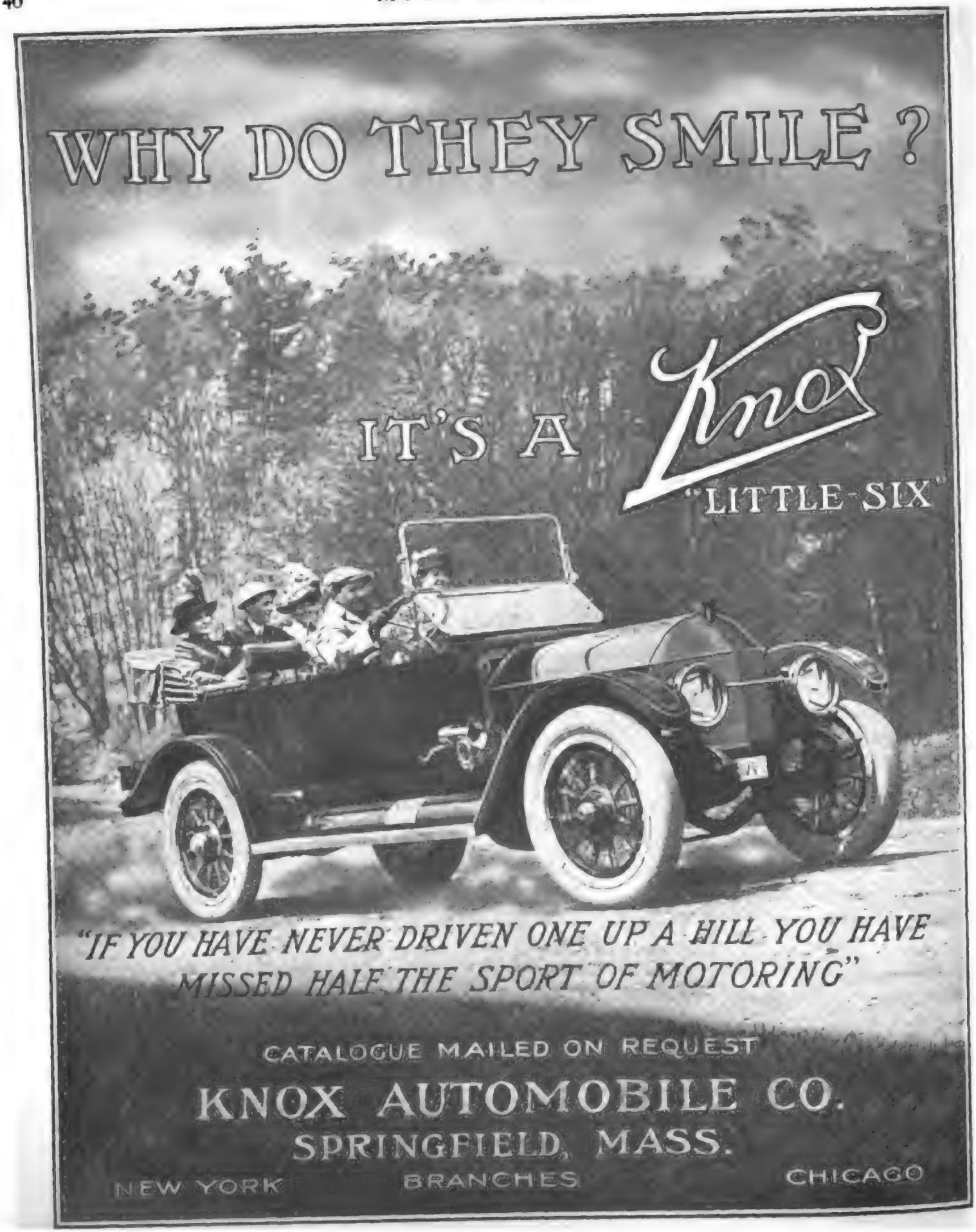
Write us for full information

Willard Storage Battery Company
CLEVELAND, OHIO

New York Branch: 136 W. 52d Street
Detroit Branch: 1191 Woodward Avenue
Chicago Branch: 2241 Michigan Avenue
San Francisco Branch: 243 Monadnock Building

Depots in All Principal Cities in the United States, Canada and Mexico

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WHY DO THEY SMILE ?
IT'S A Knox "LITTLE SIX"
"IF YOU HAVE NEVER DRIVEN ONE UP A HILL YOU HAVE MISSED HALF THE SPORT OF MOTORING"
CATALOGUE MAILED ON REQUEST
KNOX AUTOMOBILE CO.
SPRINGFIELD, MASS.
NEW YORK BRANCHES CHICAGO

An Active Journal Covering an Active Field

Things are happening every day in both motorcycling and bicycling and every week these happenings are accurately reported in the pages of this paper

THE OLDEST AND MOST INFLUENTIAL CYCLING JOURNAL IN THE WORLD

THE BICYCLING WORLD (FOUNDED 1877) and MOTOCYCLE REVIEW

Published Every Tuesday

10c. a copy $2.00 a year

Sample Copy Sent Free on Request

Bicycling World Company
1600 Broadway
New York City

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Special Guarantee Notice to Motorists



GENUINE DUNLOP Straight Side TIRES

are now absolutely guaranteed against rim cutting during the life of the tire

For ten years' time we have been the exclusive makers of the Genuine Dunlop Straight Side Tire, practically the same in design as it now appears.

Ten years have proven to us that this tire is absolutely proof against rim cuts under all sorts and conditions of service. Now we back our belief in the Dunlop by an iron-clad guarantee such as no other tire maker has ever offered since tires were first built.

The Genuine Dunlop Straight Side Tires offer the motorists a combination of desirable features that is unmatched in the whole tire field.

1st. **Strength and durability that can only come from our four-factory co-operative method of manufacture.**

2nd. **The easiest tire in the world to put on and take off.**

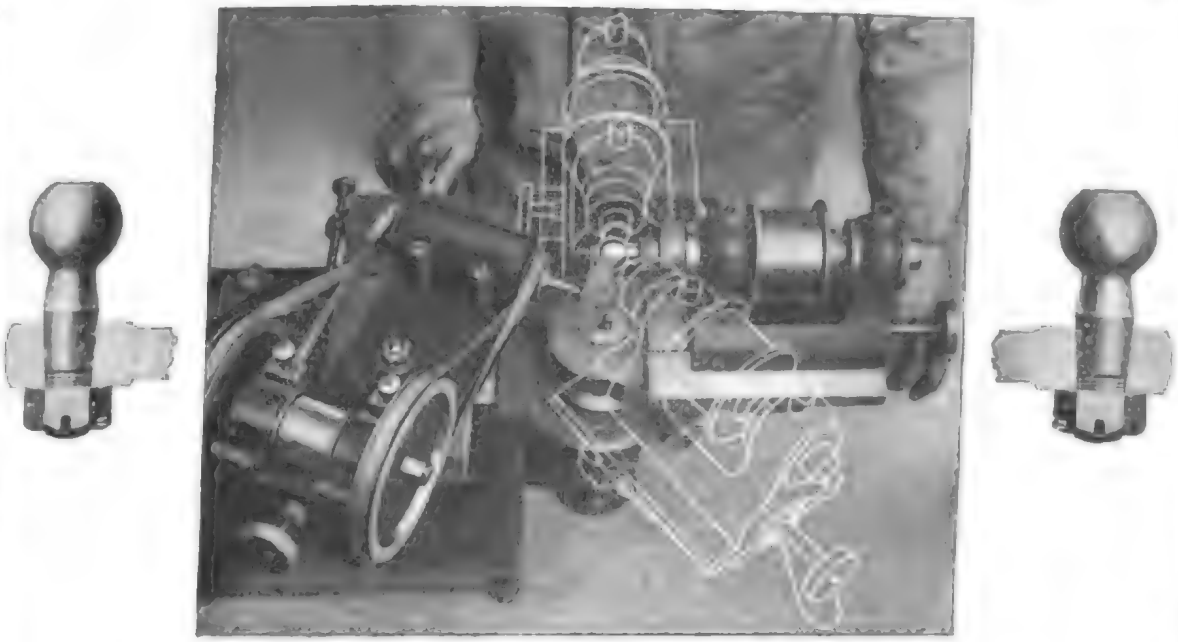
3rd. **An iron-clad guarantee against rim cuts.**

And remember this, the Genuine Dunlop Tire—the only tire that possesses all the merits of this type, is made exclusively by the

UNITED STATES TIRE COMPANY

:: :: :: :: NEW YORK :: :: :: ::

NOTE: As always the guarantee of the United States Tire Company attaches to its tires when filled with air at the recommended pressure only.



On Trail of the Perfect Sphere

¶ At the end of a long row of grinding machines stands the one that is forming a ball.

¶ It's hot on the trail of the perfect sphere, for on that little steering ball of the front axle depend the life and safety of those who ride in the car.

¶ As you watch, you see the ball spinning and fiery sparks streaming from the rim of the whirling emery wheel.

¶ And back of it all—as in hundreds of other operations—lies a story. The story of faithfulness in the making of

Timken-Detroit Axles

¶ Whenever the motor car changes direction, the steering arms wings back and forth and the ball turns in the socket of the steering connection.

¶ To work perfectly in every position of the arm the ball must be a true sphere. Otherwise in some one position there would be a slight looseness; and vibration would start the ball pounding in its socket.

¶ A little pound would bring more looseness—the extra play would bring more pound. And the trouble would increase more and more rapidly.

¶ When it reached the point where wheels no longer respond to the flash of the driver's thought—it would mean danger.

¶ But if the sphere is perfect there's no looseness at any point and no chance for a pound to begin. The connection starts out right for *every* position and remains right all the time.

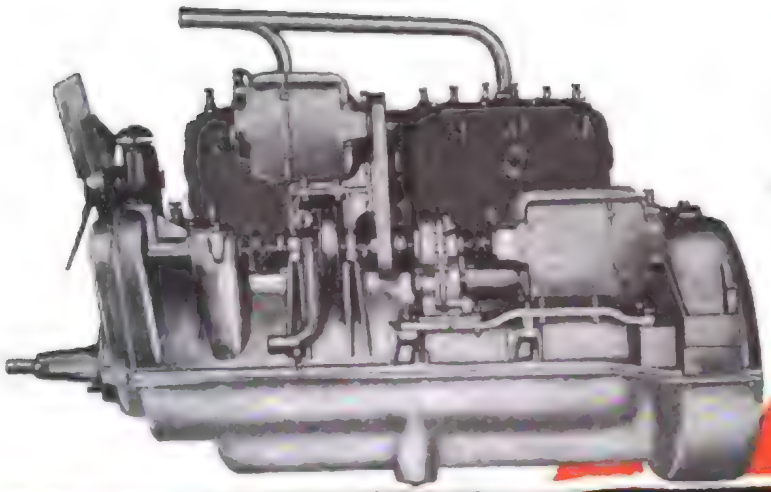
¶ To make the roundness of ball a certainty in the Timken-Detroit Axle is the mission of the grinding machine at the end of the row that keeps on the trail of the perfect sphere.

The Timken-Detroit Axle Company

Detroit, Michigan, U. S. A.

The only axle manufacturer licensed to make axles equipped with Timken Tapered Roller Bearings

19



The Self-Starting Six

CONTINENTAL

The Self-Starting Six

These motors were designed since the advent of the electric starter. Any electric starting device can be mounted on the crankcase—due to the crankcase design. These thoroughly tried-out motors are backed by the ripe experience and successful reputation of the entire Continental organization.

Manufacturers will do well to remember the pulling power of the "Continental" reputation as well as the pulling power of "Continental" Motors.

"Continental" Motors have that sure quality, that absolutely defined measure of value, that enables car manufacturers to get a little more for a car when equipped with a "Continental"—and, all the time, you are giving a little more for the money.

Dealers have found by experience that it is easier to sell cars equipped with "Continental" Motors.

Be Sure and Look for "Continental" Motors at the Chicago Show

Here's the "Little Six" We Promised You

3¾ in. x 5¼ in. bore and stroke—compact, light, powerful—shown for the first time at Chicago. You recall the sensation made by the Continental "Bix Six" at Chicago a year ago; this new "Six" will stir things up again. Don't miss it, and write for further details.

MOTORS FOR COMMERCIAL CARS

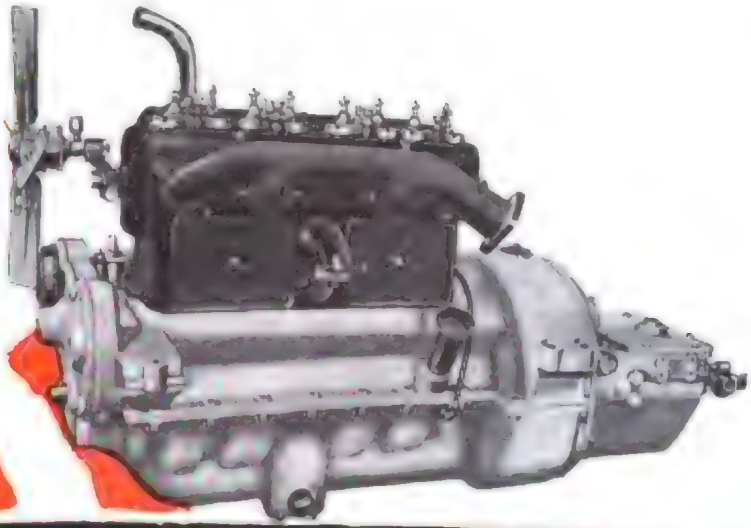
This end of the "Continental" business is growing fast. Manufacturers and users both share in the enthusiasm for our Commercial car types—and this enthusiasm is based on the "Make-good" quality inherent in the "Continental" product. We know commercial services and sizes—and "Continental" Motors stand up to the work and take the gaff without flinching. Write for details.

CONTINENTAL MOTOR MANUFACTURING COMPANY, Detroit, Michigan



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The Self-Starting Four



MOTORS

A Word to Car Manufacturers and Dealers

You can utter no stronger praise of your motor than to say it is a "Continental." Concentration on one thing—the building of the best motors that can be produced—has built the "Continental" reputation and made it "solid as the rock of Gibraltar."

No one would think of putting a diamond in a brass setting. Likewise no manufacturer would think of putting a "Continental" motor in a poorly built chassis. This is the reason why you never hear of any but good cars equipped with "Continental" motors. Manufacturers do not buy "Continental" motors because of PRICE but because of known QUALITY, and that quality is an asset that is uniformly backed up by high grade construction throughout.

Look for the Name-Plate "Continental"

Endurance, strength, flexibility and economy are the qualities sought and secured in every motor bearing the "Continental" Trade-Mark. Silence is an incident and follows naturally with right design and careful workmanship.

These are some of the reasons why the name "Continental" on a motor inevitably calls to mind the highest type of motor satisfaction.

Not all the "Continental" motors exhibited at the Show will be found in the "Continental" booth. Look for the little brass plate with the name "Continental." Car builders are just as keen to have it on their motors as we are to put it there. And the one big, vital reason is QUALITY.

CONTINENTAL MOTOR MANUFACTURING COMPANY, Detroit, Michigan







SHELDON

Trucks equipped with the Sheldon Steel Wheels, Axles and Springs have the best commercial car equipment that the hand of man can make or devise.

Our famous steel wheel is positively unbreakable under any conditions of actual service. It weighs less than the artillery wheel and it is easier on tires than any wheel ever before used because of it's light weight at the periphery.

The heat caused by hard service radiates rapidly from the metal of the Sheldon Steel Wheel another reason why trucks equipped with this wheel are easier on tires.

The new Sheldon Axle for heavy service is another Sheldon triumph. It is made doubly strong wherever wear falls and friction is minimized by numerous and scientifically placed oil cups.

We offer these axles to the motor truck industry with the choice of the following bearing equipment:

Standard Taper Roller Bearings.
Bower Straight Roller Bearings.
New Departure, Rhineland, F & S, Hess-Bright, or any standard Double Row Annular bearings.
Single Row Annular Bearings can be applied by using spacers.

This is a great innovation in axle manufacture. We have spared no effort or expense to make our axles perfectly "fit" and the manufacturer who offers a Sheldon equipped truck is giving his customers the most scientific axle equipment that can be made.

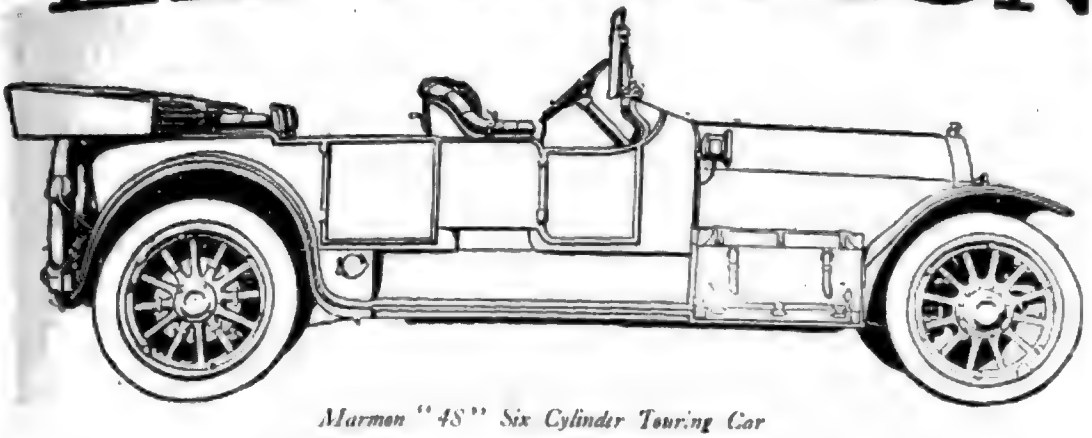
SHELDON AXLE CO.
WILKES-BARRE, PA.

CHICAGO BRANCH
68 East 12th Street

DETROIT BRANCH
1215 Woodward Avenue

"The Easiest Riding Car In The World"

THE MARMON



Marmon "48" Six Cylinder Touring Car

What Service Means

The man who sells many cars is more interested in service than the man who buys one car for his own use.

Conditions are changing.

Over half the buyers of cars this year will be men of experience—men who have owned cars before.

They will not be misled by low initial price—or some one detail of equipment—or the body design. But they will demand service.

The basis of Marmon value is its service.

You may have an idea of Marmon superiority at a glance by the clean-cut appearance of the car—its complete equipment.

Records on track, road and tour in the world's greatest contests, backed by owners' records in service, will teach you more of Marmon value.

A Marmon demonstration will open your eyes to a new idea of easy riding and the operation of the silent, smooth, sweet-running power plant will prove its efficiency.

Years of service but increase the enthusiasm which the demonstration inspires.

And this service in its economy of tires, and upkeep; in its proof of the true wisdom of buying the best; becomes an unapproachable argument for the man who is selling Marmon cars.

The Marmon "Thirty-Two"

Four cylinder, 32-40 h. p., 120-inch wheelbase, electric starting and lighting system, left-hand drive, centre control, nickel trimmings, with newest body types to meet every requirement and corresponding equipment—

$2,850 to $4,100

The Marmon "Forty-Eight"

Six cylinder, 48-80 h. p., 145-inch wheelbase, electric starting and lighting system, left-hand drive, centre control, nickel trimmings, with body types to meet every requirement and corresponding equipment—

$5,000 to $6,350

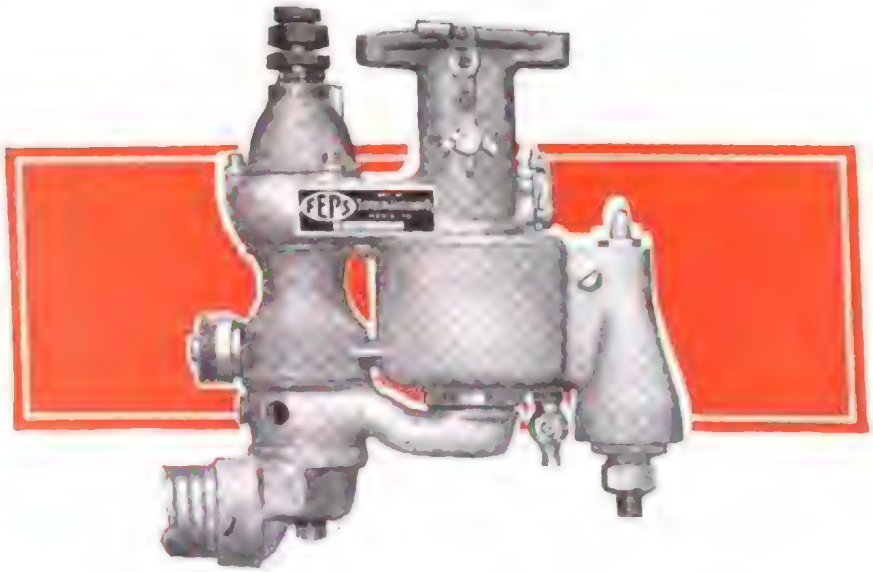
Detailed Information on Request

Nordyke & Marmon Company

Indianapolis (Established 1851) **Indiana**

Sixty Years of Successful Manufacturing

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The FEPS CARBURETOR

"A GIANT IN POWER — A MISER IN FUEL"

IT cannot be denied that one of the weakest points in the gasoline motor today is the carburetor. It has stood still for several years while its neighboring accessories have been striving forward to perfection.

¶ The FEPS carburetor is being produced at the right time to be appreciated by long suffering motorists. It meets an imperative need.

¶ With it the most inexperienced driver can secure 25 per cent. to 50 per cent. more miles per gallon of fuel out of any car than with any other carburetor in the world, without sacrificing one iota of power or speed. It involves a new principle of auxiliary air supply that produces a wonderful increase in flexibility as well as economy and power.

¶ The FEPS contains no springs, no balls, no cams, no reeds and all adjustments once made are permanent. It gives a perfect mixture with any grade of gasoline and is unaffected by altitude, weather conditions or change of temperature. It embodies a new and efficient automatic priming device for quick starting which is especially valuable in cold weather.

Write at once to Department "F" for interesting illustrated booklet. Every reliable dealer should have our trade proposition.

FEPS CARBURETOR

See the Feps at the Chicago Show

Coliseum Annex (Balcony) Space No. 206, No. 207.

Schoen-Jackson Co.

MEDIA, PA.

FEPS CARBURETOR

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EISEMANN

WHERE efficiency counts most—there you will find the Eisemann automatic spark control magneto in greatest favor. No ignition device ever placed on the market has found such general favor as have all the Eisemann models with automatic spark control, among the makers of the better grades of commercial vehicles.

A motor equipped with this positive and accurate spark control is giving its maximum all the time, insofar as ignition is concerned.

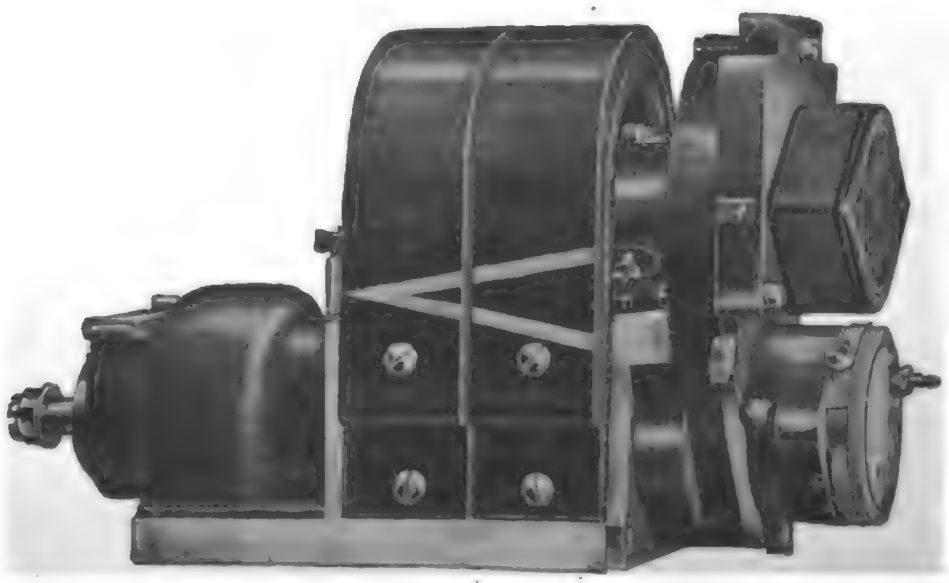
The greatest showing of the wonderful efficiency of this Eisemann device is made when climbing hills under load. Accept the first opportunity you get to climb a hill with a motor hooked up with an Eisemann automatic spark control magneto. Note the power increasing every inch of the way. That will convince you better than words. Or let us know when and where we can give you this demonstration.

The Eisemann Magneto Co.

General and Sales Office
225-227 West 57th Street, NEW YORK

INDIANAPOLIS, IND.
514 North Capitol Avenue

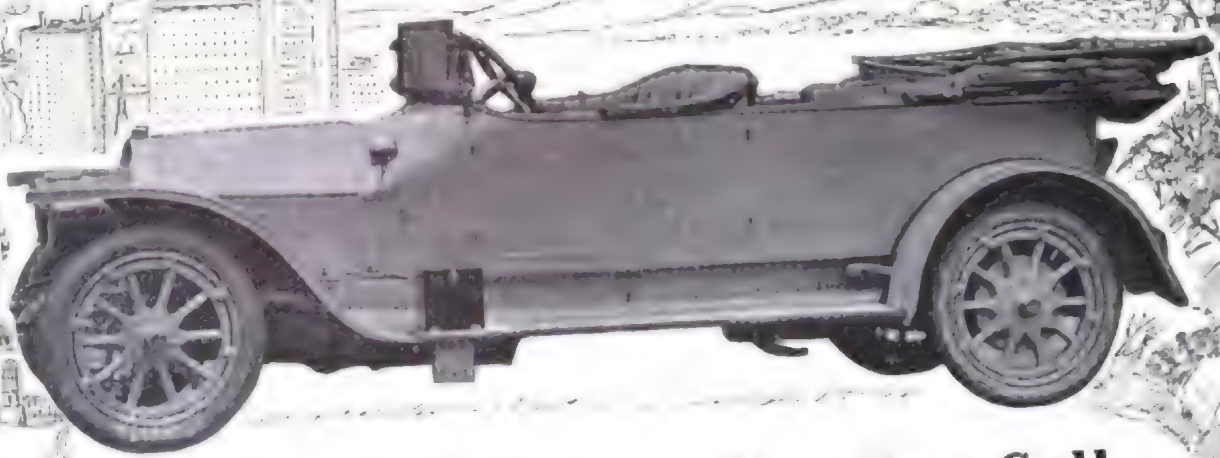
DETROIT, MICH.
802 Woodward Avenue



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Lancia Cars

"They copied all they could follow,
But they could'nt copy my mind,
And I left 'em sweating and stealing
A year and a half behind."
—Kipling



DEALERS You Can Sell This Car

"The Best of Europe At American Prices"

The Lancia propaganda has taken root and is growing in America—and the reason is mighty obvious.

There is a class, Mr. Dealer, and a restricted one at that, who understands, appreciates and buys this peer of light European cars—(we will send you the names on request).

And there are those in ***your*** territory to whom its combination of strength, efficiency, simplicity and design will appeal.

The Lancia is the best of Europe at American prices—meaning that the purchaser of a Lancia car does not have an extravagantly priced European novelty of freak design—

But a ***real service*** car from Europe—a masterpiece of European design, steel and finish—made and tested in the Alps under the personal supervision of Vincenzo Lancia himself—with a guaranteed value, pound for pound, dollar for dollar greater than that offered by any American or European manufacturer.

Do you want to sell a car of class, service and beautiful design to the fastidious and critical? If you do, then come to New York if possible —see and know the Lancia—or write and let us give you details of the "20" and "30" mounted with coach work in keeping with the chassis.

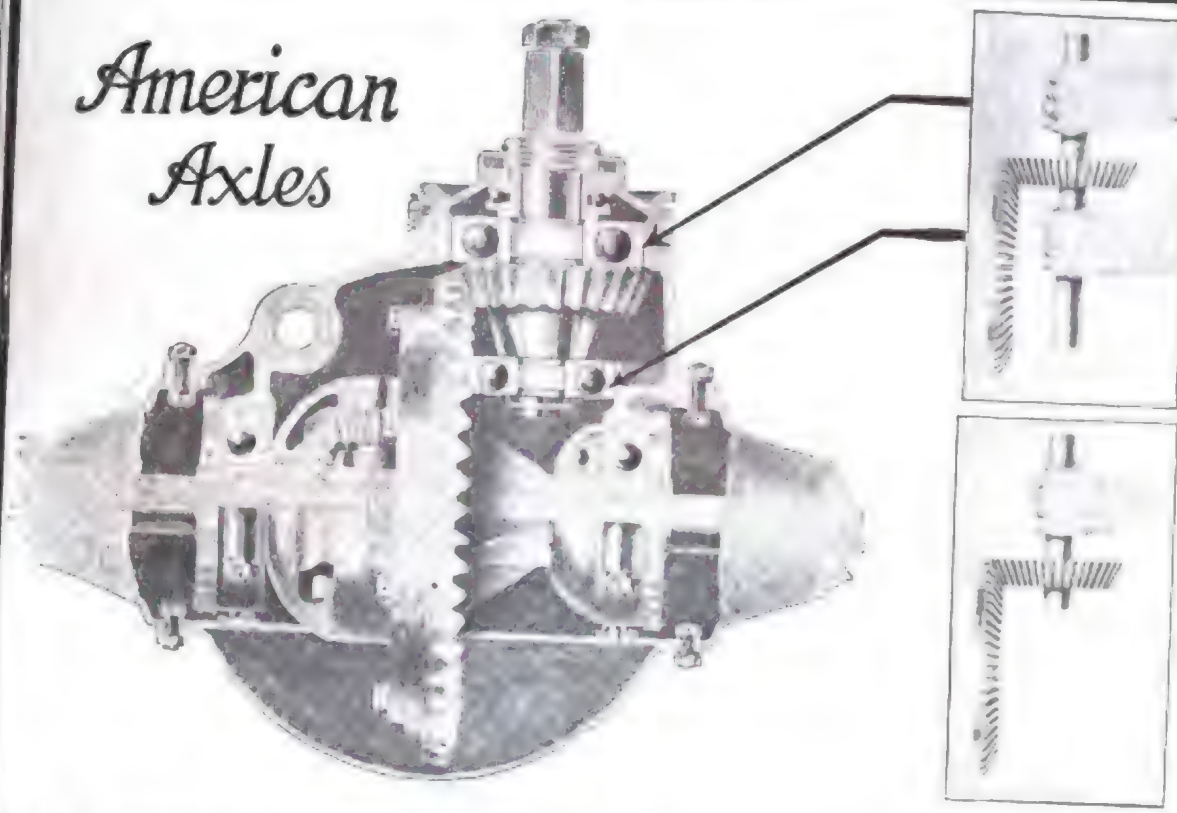
For Town

For Country

ADAMS LANCIA COMPANY

235 West 38th Street **NEW YORK, N. Y.**

American Axles



Where Silence Depends Upon Strength

The two hands holding a pinion shaft aptly illustrate an important feature of *American Axle* bevel gear construction. Follow the arrows to the bearings on either side of the pinion, firmly holding its shaft in absolute alignment.

Equal results are impossible if the inboard bearing is omitted, just as a single hand cannot hold a shaft in place without vibration and wobbling.

The inboard bearing, with its support and integral part of the housing, is so much better than the cheaper construction which omits it, that *American Axles* are an index to the quality of a car.

Precedence among cars can be safely based upon their use or lack of *American Axles*. They typify the quality which establishes standards for motor cars.

In addition to our Bevel Gear Axles, we hold the exclusive rights as axle manufacturers in America to the Lanchester-Daimler Worm Drive.

THE AMERICAN BALL-BEARING COMPANY

Edgewater Park & L. S. & M. S. Ry. CLEVELAND, OHIO

CUBIT



ELECTRIC HORN

$3.00

A Good Horn at a Low Price.

In Black Enamel, very High Gloss.

Weighs Two Pounds and a Half.

Consumes very little current (1½ to 2½ amperes).

Emits high toned Musical Blast.

Has no working parts to get out of order.

Has no VIBRATOR, the diaphragm is the Armature.

Requires no Oil. Runs on SIX VOLTS.

Gets better with age as the "Bulging" of the diaphragm which is detrimental to other horns makes the "CUBIT" more efficient.

Extra charge for push button and wire

NONPAREIL HORN MFG. COMPANY

73-75 Wooster Street *Eastern Distributor* NEW YORK CITY

KOSMAK ELECTRICAL CO. Office and Factory, 209 Ocean Avenue Factory, 17 Stevens Avenue Jersey City, N. J.

Branch Office, Ford Building, Detroit

The Canning and Vinton Auto Co., Golden Gate Avenue, San Francisco, Cal., Distributors for Pacific Coast

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Exclusive in any Community

METALLURGIQUE

Will Sell in Your Community

DEALERS

The European Car Idea is Growing in America — is your Ear to the Ground



Dealers who read this announcement will do well to consider the advisability of forming an agency connection with us for handling the Metallurgique—a car for the classes—a distinct and exclusive product, sensational in body design, equipment and appointment. These cars are limited in quantity—unlimited in quality.

From the radiator of unique design to the end of the rear springs—from tire to top, this powerful, unbreakable car offers value in service away beyond that of any other European or any American product. There is a selling argument in every item from steering knuckle to engine.

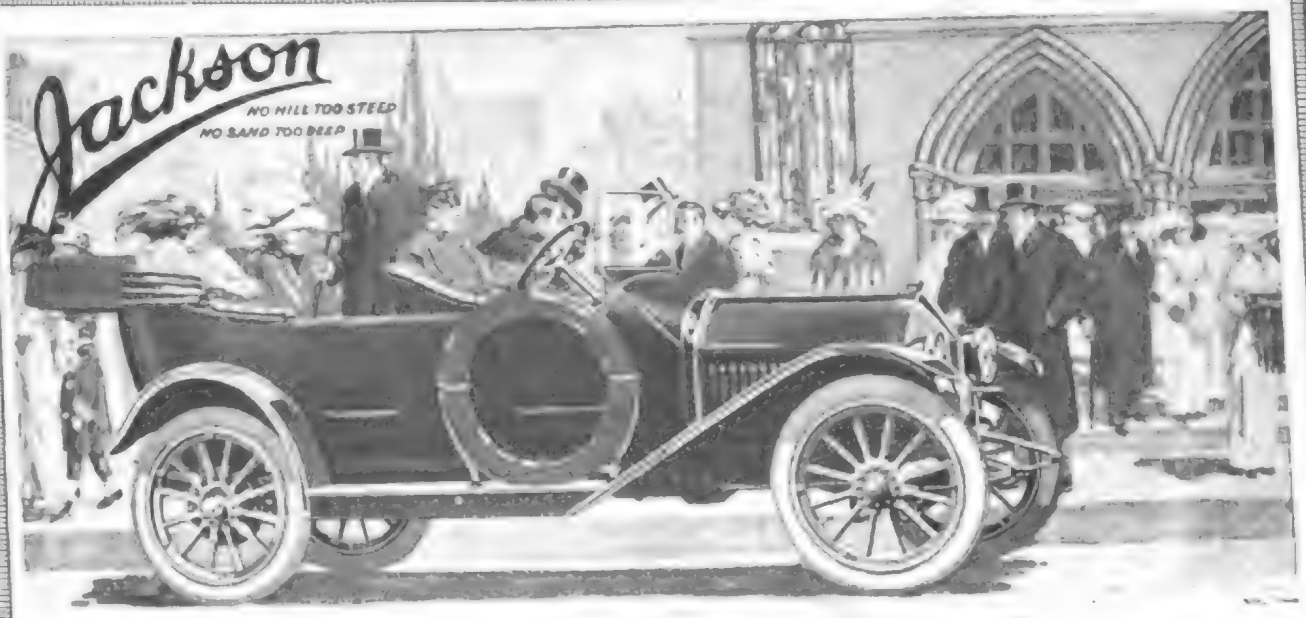
Luxury of appointments are regal—beauty of design and finish supreme on both sides of the water. Service unlimited.

The Metallurgique is the only logical car for men of wealth and position who desire an equipment that will make all others appear commonplace.

Let us help you find and please and sell to those in this class. As a preliminary, write and get the literature and terms. We can throw more light on the Metallurgique, Europe's choicest product.

THE METALLURGIQUE MOTOR CO., 1934 Broadway, New York

W. C. and H. N. ALLEN, Proprietors



Jackson "Majestic" $1,975

Forty-five horsepower, [illegible] four cylinder, long stroke motor, 4½ x 5½ inches; 124-inch wheelbase; 36 x 4 inch tires. Full elliptic springs, front and rear. Deep roomy body, with 10-inch upholstery. Electric starting and lighting system, dynamo and storage battery. Equipment of mohair top, top hood, ventilating windshield, speedometer, oil and gasoline gauges on dash, Firestone universal quick detachable rims, extra rim, tire carrier, electric horn, robe rail, foot rest, pump, tire outfit and tools. Black and nickel trimmings.

How the Jackson Dealer is fortified against competition

Three models constitute the Jackson line for 1913—two fours and the splendid new six.

Each is fitted to combat competition in the most telling way—competition in comfort, in ease of riding, in size and power—in everything that influences the buyer.

With three price figures—$1500 for the "Oylmpic," $1975 for the "Majestic" and $2650 for the "Sultanic" six—the dealer has another mighty weapon at hand.

Each model is equipped with a self-starter—Disco for the "Olympic" and electric for the other two, with electric lighting system as well.

But we do not stop there.

We help the dealer by advertising the comfort, convenience, riding ease and silence of Jackson cars in a big, generous way all over the country in the biggest and best national advertising mediums and in the metropolitan newspapers.

In other words, having given the dealer cars he can sell against anything in the market, we help bring prospects to his door.

The attitude of present Jackson dealers is interesting and enlightening.

They are all enthusiastic over the 1913 line.

Every one of them has increased his quota; because every one of them saw the wonderful sales possibilities in the new line.

Most of these men have sold Jacksons for years. Some of them have grown up with the Jackson.

They are men of experience and good business instinct. And with unanimous approval they accept the new Jacksons as the best selling line we have given them.

Dealers who are interested should not delay getting in line for the big spring business ahead of the Jackson.

Jackson "Sultanic" $2,650

Seven passenger, six cylinder, 55 horsepower, unit power plant; long stroke motor — 4½ x 4½ inches; 138-inch wheelbase; 36 x 4½ inch tires. Full elliptic springs, front and rear. Deep, roomy body, with 10-inch upholstery. Gasoline tank under dash supplied with storage tank at rear, with pressure pump. Total capacity, 20 gallons. Electric starter, electric dynamo and lighting system, mohair top, top hood, ventilating windshield, speedometer, oil and gasoline gauges on dash, demountable wheels, extra wheel, wheel carrier, robe rail, foot rest, pump, jack, tire outfit and tools. Trimmings black and nickel. Five passenger, $2500.

Jackson Automobile Co.

1204 E. Main Street
Jackson, Mich.

Chicago Show, February 1-8.

First Regiment Armory, Space B-2.

Immediately to Right of Michigan Avenue Entrance.

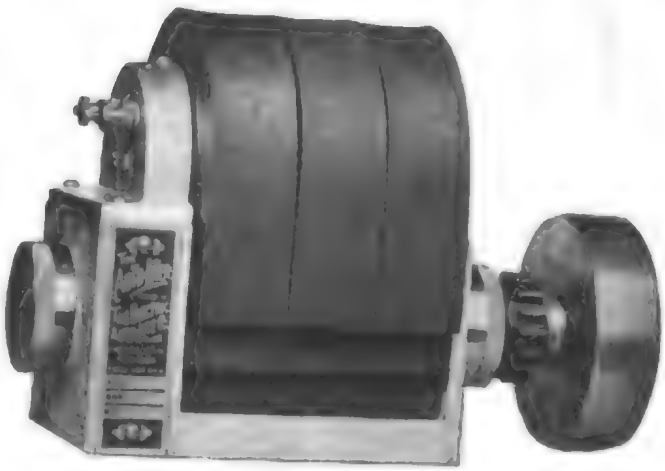
Jackson "Olympic" $1,500

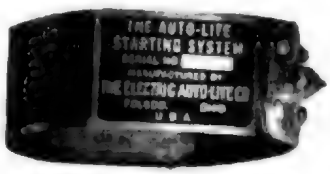
Thirty-five horsepower, unit power plant; four cylinder, long stroke motor — [illegible] inches; 115-inch wheelbase; 34 x 4 inch tires. Full elliptic springs, front and rear. Deep, roomy body, with 10-inch upholstery. Gasoline tank under dash, supplied from storage tank at the rear, with pressure pump. Total capacity, 20 gallons. Equipment includes Disco Self-starter, mohair top, top hood, ventilating windshield, speedometer, oil and gasoline gauges on dash; Prest-O-Lite tank, with automatic electric lighter; Firestone universal quick detachable demountable rims, extra rim, tire carrier, robe rail, foot rest, pump, jack, tire outfit and tools. Trimmings black and nickel.

"AUTO-LITE" ELECTRIC STARTER

Manufacturers and Dealers, See This Simple System.

During the New York Show our booth was constantly crowded by those getting information concerning this most necessary and successful motoring requisite.







We have solved the problem of starting and lighting the motor car and are especially anxious to demonstrate our success to you.

Call and let us show you our compact, efficient motor, driving the engine through gears or chain and sprocket, at the ***front*** end of the crankshaft.

Ask to see how the starter automatically disengages itself when explosions occur in the engine cylinders.

Chicago Show
Spaces 202 and 203 Coliseum Annex
Second Floor

THE ELECTRIC AUTO-LITE CO.

Main Office and Factory, Toledo, Ohio

BRANCH OFFICES: New York Kansas City San Francisco

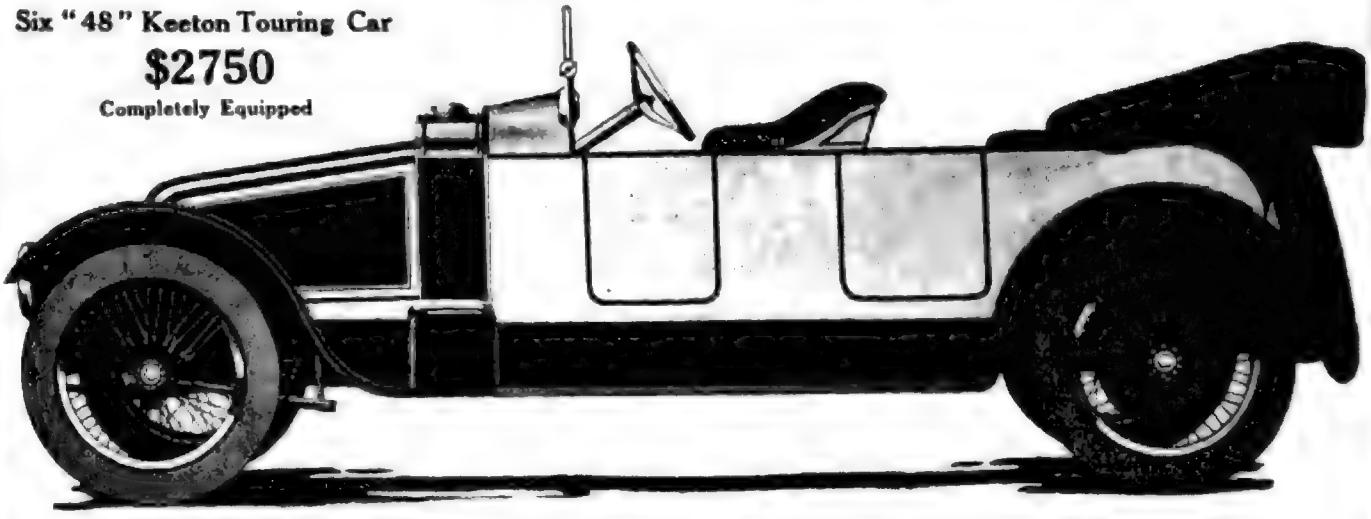
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Keeton Six Scored Two Triumphs in New York

Six "48" Keeton Touring Car

$2750

Completely Equipped



One Week at Importers' Show—
Next Week at Grand Central Palace—
Side by Side With the Best of Two Continents—
Keeton Six Was Always the Center of Attraction.

Over at the Importers' Show in New York the Six "48" Keeton was the first American car ever exhibited there. It was also the first embodying all the worth while advantages of the European cars made in the economical American way. In that select company the Keeton was the one car that offered the splendid features of the foreign builders at the price which the American buyer knew was reasonable. In this Importers' Salon the Keeton Six was always surrounded by an enthusiastic crowd of admirers—it won immediate popularity.

The next week at the Grand Central Palace the Keeton continued the success which was started so gloriously the week before. Here it was exhibited among the finest products of American motordom. Because of its foreign design it stood out differently from any other car at the show. American designers, engineers, manufacturers and salesmen studdied this model intensely and with some envy. It brought to the dealers' minds many prospects from their territory who wanted a car of such distinctive features and naturally much of the eastern territory was contracted for. Many New Yorkers made their first deposit and begged for the first delivery. Everybody who saw the car in New York talked Keeton.

Last week it was on exhibition at the Wayne Garden Show in Detroit—in the very heart of the automobile industry. Here the popularity continued. Detroiters, the motor wise populace of the United States, were quick to recognize the unusual, attractive features of the Keeton Six. Its long wheel base, 136 inches, insuring easy riding—its long stroke, six cylinder motor, 5½ inches, and its small bore, 3¾ inches, denoting exceptional power and flexibility—wire wheels, 36 x 4½ inches, were just a few of the many superiorities which were pointed out. This week in Chicago, at a place which will be announced in the Chicago daily papers, Keeton will be exhibited, and its triumphs will be continued.

Dealers Will Read This:

It is needless for us to tell you dealers that these cars are selling fast. A good portion of our 1913 output has already been sold, and when we say sold we mean contracted and paid for.

The Keeton is selling fast wherever we are showing it. It has so many superiorities that it is virtually selling itself. There are many prospects in your town who want a car of this type and at this price. If you are at the Chicago Show, see our exhibit, talk to our sales representatives. If your territory is not closed, and you represent the type of salesman we want in your territory, there will be a great opportunity for you.

We have been unable to secure space in the Coliseum Show at Chicago where we can exhibit all the advantages of the Keeton car. The Chicago daily papers, however, will announce the place of our private exhibit. Come in and look the car over anyway.

KEETON FEATURES

Electric starting
Full Electric Light Equipment
Transmission four speeds forward
Wire Wheels—with option of Wood Wheels
Chrome Vanadium Gears and Shafts on Imported Annular Ball Bearings
Extra Detachable Wire Wheel, or extra Demountable Rim
Long, easy riding Springs—long wheel base, 136 inches
Left Hand Drive—Center Control.
Cylinders cast en bloc; large valves
Small bore, 3¾-inch—long stroke motor, 5½-inch, of exceptional power and flexibility
Radiator at rear of motor—in proper and protected position
The only true French type of car built in America.
Best of foreign practice adapted to American road and touring conditions.

Complete Equipment

Electric starting and lighting system, with 12¼-inch head lights, tail lamp with license holder; 80 mile Speedometer and eight-day clock combined with electric light; Lamp for changing tires at night, with extension cord; Dynamo electric Horn; Robe and Foot Rails; Silk Mohair Top, with self-contained folding curtains and slip cover; double acting rain vision Windshield; option of Wire Wheels with extra detachable Wire Wheel, or Wood Wheel with extra demountable rim; Wheel or Tire Carrying Irons; Full Set of Tools; Pump; Jack and Tire Repair Outfit; and all Touring Bodies will take Auxiliary Seats.

Three Excellent Models

Riverside Touring Car, 5 passenger, completely equipped	$2750
Two extra folding seats for above, $25.	
Meadowbrook Roadster, completely equipped	$2750
Tuxedo Coupe, completely equipped	$3000
Chassis without tires or rear guards	$2250

All prices f. o. b. factory. Booklet on request.

KEETON MOTOR COMPANY, Detroit, Michigan

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KLINE KAR

Chicago Show
Armory

KLINE KAR OWNERS ARE SATISFIED OWNERS

SEPARATE—

Two Systems **IGNITION** Bosch Magneto

Electric **STARTING** Equipment

Electric **LIGHTING** Dynamo

Four Speed Forward Transmission

PRICES

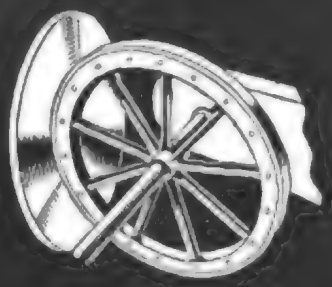
Model 4-30 - - - - - Three Body Types	$1750	Model 6-50 - - - - - Five Body Types	$2585
Model 4-40 - - - - - Five Body Types	$1985	Model 6-60 - - - - - Six Body Types	$3500

Address Department W for Catalog

KLINE MOTOR CAR CORPORATION

RICHMOND, VA. Main Office and Factory RICHMOND, VA. YORK, PA.

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The Gearless Transmission!

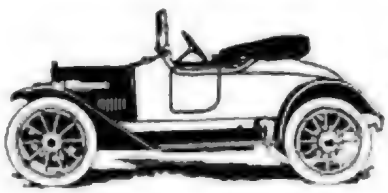
More Efficient—More Reliable

When you consider what the Cartercar will actually do—for every driver—for you—then you realize that it has no competitor from the standpoint of efficiency. It climbs a 50 per cent. hill—runs through deep mud and sand—has unlimited speeds—and requires only about half the usual expense for tires, because there are no jerks or jars.

These features are made possible by the remarkable Gearless Transmission. This is the strongest feature of the Cartercar.

And then think of reliability. Cartercar is simplicity itself. The transmission has only two unit parts—the control is by a single lever—in every detail of construction you find fewer parts than in the ordinary car.

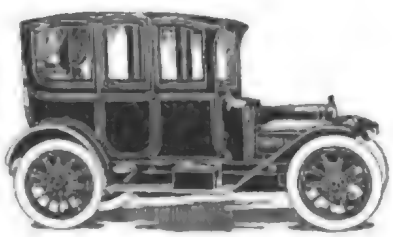
But in addition to having such few parts—the construction of the Cartercar is so unique that almost all possibility of road trouble is eliminated.



Model 5 B

Roadster—With Electric Starting and Lighting System and Complete Equipment

$1600



Model 5 D

Five Passenger Sedan—With Electric Starting and Lighting and Complete Equipment

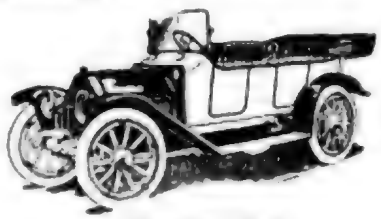
$2000

Four Good Models

A Touring Car, Roadster, Coupe and Sedan—all practical, yet exceedingly handsome big cars, make up the new Cartercar line. All have a perfect system of electric starting and lighting.

At All the Big Shows

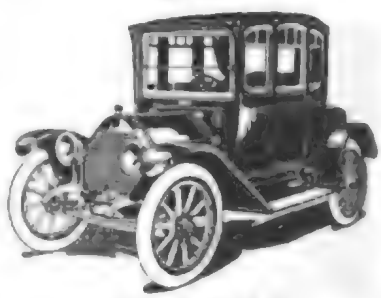
Look up the Cartercar exhibit at the big shows—all the models will be there. Compare them carefully with others at any price—and meanwhile think of the extra service of the Cartercar and the very reasonable prices. If you ask we will gladly send our new catalog.



Model 5 A

Five Passenger Touring Car—With Electric Starting and Lighting System and Complete Equipment

$1700



Model 5 C

Colonial Coupe—With Electric Starting and Lighting System and Complete Equipment

$1900

Cartercar

Cartercar Company

Pontiac, Mich.

Branches: New York, Detroit, Chicago, Kansas City, Atlanta



Eleven Facts About Hyatt Quiet Bearings

FACT 1. Hyatt Roller Bearings afford a line (—) bearing instead of a point (.) bearing as is the case with ball bearings. There is more surface to carry the load, yet with but little friction. They are American bearings for American roads.

FACT 2. Hyatt Roller Bearings are flexible. They give under shock, still are rigid enough to carry their load and remain round.

FACT 3. Hyatt Roller Bearings are quiet. Noise is caused by the vibratory motion of any solid substance. Shocks and jars produce vibrations which rigid bearings transmit and intensify. The flexibility of the Hyatt Roller cushions shocks—absorbs vibrations—hence reduces noise.

FACT 4. Hyatt Roller Bearings will retain a large quantity of Lubricant because the rollers are hollow. The spirals in the rollers alternate from right to left, thus constantly distributing the lubricant in all directions over the surface of the rollers.

FACT 5. Hyatt Roller Bearings have no delicate adjustments to be tampered with after the car has left the factory. Carelessness, curiosity or ignorance will not cause trouble by making improper adjustments in Hyatt Bearings as is often the case with others.

FACT 6. Hyatt Roller Bearings are less liable to Accident or Injury because they carry the same load on a larger surface than ball bearings afford.

FACT 7. Hyatt Rollers Never Crowd or pile up in a bearing, thereby grinding and destroying the entire bearing.

FACT 8. Hyatt Rollers Will Not Crack or split as balls sometimes do when the wheels drop into a rut and the car is heavily loaded, thus causing annoyance, delays and expensive repairs.

FACT 9. Hyatt Roller Bearings reduce excessive and unnecessary Wear because they relieve gears and shafts of undue strains resulting from imperfect alignment.

FACT 10. Hyatt Roller Bearings are made only from carefully Selected Steels which are chemically and physically tested, heat treated and ground.

FACT 11. Hyatt Roller Bearings were used on 91.7 per cent. of all pleasure and commercial cars that were manufactured during the season of 1912.

HYATT ROLLER BEARING CO.
DETROIT, MICHIGAN

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HOFFECKER'S SPEEDOMETERS

THE QUALITY THAT CAR DEALERS-MANUFACTURERS



The name "Hoffecker" on a speedometer and "Waltham" on a timepiece stand sponsor for quality that is standard and of world-wide reputation. Car owners who read and reason before they buy, ***know*** this quality and ***demand*** it.

No enlargement on the prestige of the Hoffecker and Waltham products is necessary here. This has been established through years of consistent service. It is rather the present intent to ***show how*** it is commercially possible to produce these instruments of precision and durability at prices within reason.

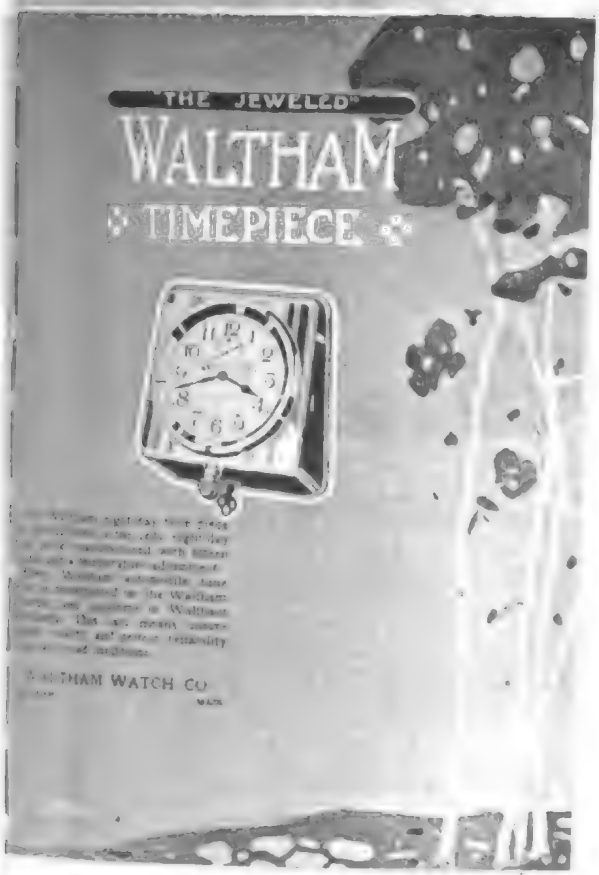
Hoffecker speedometers and Waltham timepieces have never been extravagently exploited. They have never had quality sacrificed to meet tremendous advertising overhead expense. They embody sterling worth in material, fine workmanship and finish, ***made possible only by the money that goes right into the instrument—not into indiscriminate waste publicity.***

Of course, they ***are*** advertised, but

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COMBINATION OWNERS DEMAND WALTHAM TIME PIECES

READ THE MESSAGE

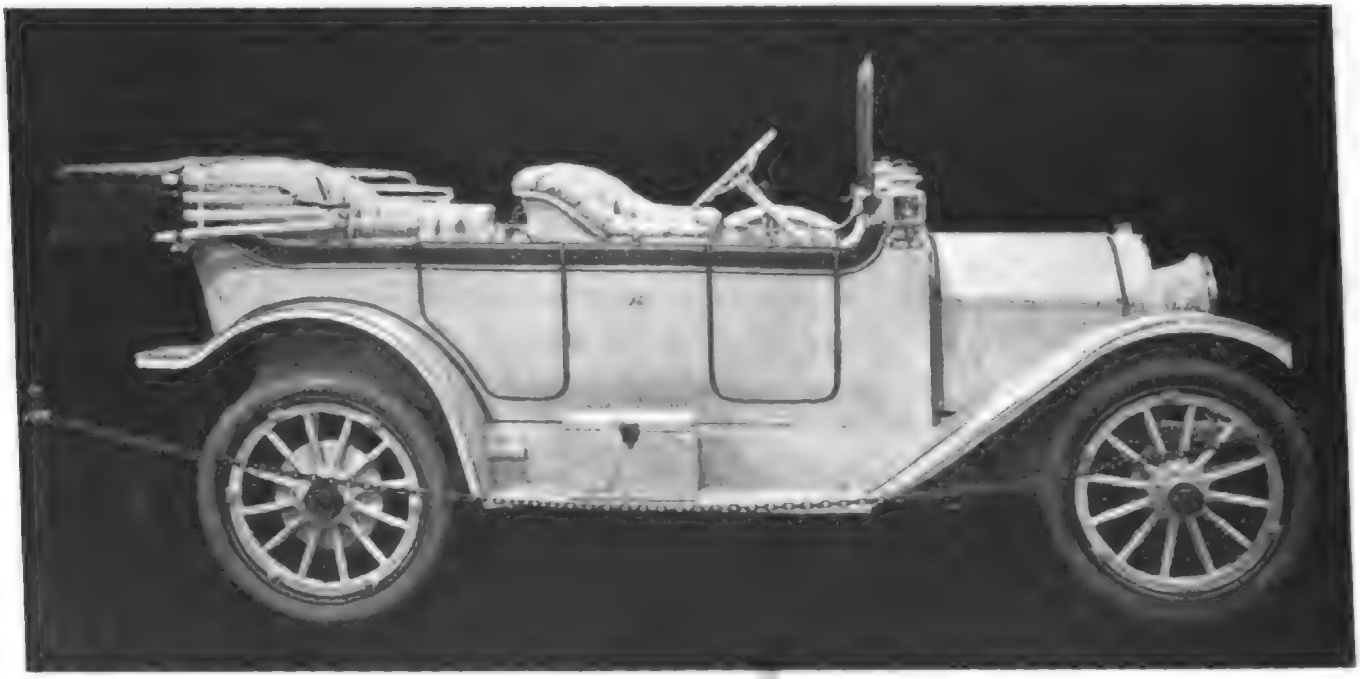


always on the "bull's eye" basis, and with no "scattering fire" effort. This publicity has value plus—for the car manufacturer, the dealer and ourselves. Read why. The double-page reduced advertisement shown here, is typical of Hoffecker-Waltham advertising, current in ***Motor, The Automobile*** and ***Motor Age***—three papers that practically cover the cream of car owners who, as readers of these publications, are qualified to recommend and buy intelligently. In brief, this group constitutes a buying and selling force in the field. Through reading and observation, they recommend the best to others and demand the best for themselves.

"Hoffecker-Waltham" is a combination that ***your*** trade wants. It is a combination that will make a good car better, lessen resistance and increase your prestige in your community as a dealer who is known as a believer in standard, dependable merchandise. In all probability the cars you sell ***are*** so equipped—if not, then get all the facts from us—you may be able to help your customers to more and better service.

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$850 Detroiter $900



A Car of Ivory and Fine Gold

The car that made the big hit at the New York Show. This week it is creating a parallel excitement in Detroit. During the Chicago Show it will be on exhibit at the salesroom of the

Illinois Automobile Company, 1240 Michigan Ave, Chicago

THE cost of making this beautiful car was far above the standard Detroiter price, yet in the essentials of construction it is identical with every other Detroiter that leaves the factory. Money cannot buy better principles than are found in every car of our output. It can only purchase the non-essentials.

$850 Is the Standard Price

Every Detroiter has nine exclusive features that are not combined in any other car short of four times the Detroiter price. It has the platform rear spring, full floating rear axle, ball bearings throughout, long stroke motor and similar features that the experience of car makers has proved best.

Economical in After Cost

The Detroiter—any weather, any roads—averages from 20 to 25 miles on a gallon of fuel, and 100 miles to the quart of lubricant. No car of its enduring construction can match this record. No selling argument is so powerful as this—when gasolene is going up every month.

Dealers:

For the Middle West especially, the Detroiter is this season's leader. When you come to Chicago, come with your mind made up to give the car the thorough inspection it deserves. Remember, it will not be on exhibition at the Show. You will find it at the salesrooms—1240 Michigan Avenue.

If you are not coming to the Show, write for further information.

BRIGGS-DETROITER COMPANY

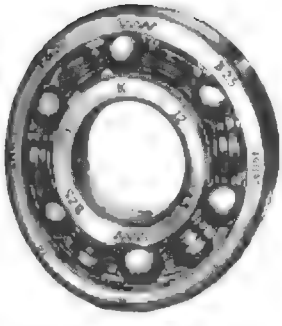
449 Holbrook Avenue **Detroit, U. S. A.**

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The J. S. Bretz Company Announce A New F & S Ball Bearing For 1913—Fitted With Their New Blue Ribbon Retainer

"——the good plan itself, this comes not of its own accord; it is the fruit of genius, which means transcendent capacity of taking trouble first of all."

—Carlyle.



F. & S. Bearing Complete



F. & S. Outer Raceway and Balls



F. & S. Inner Raceway



F. & S. Blue Ribbon Retainer

FOR 1913 Messrs. Fichtel & Sachs, of Schweinfurt, Germany, manufacturers of the well-known F. & S. radial and thrust ball bearings, have recently added a new type of ball separator to their other types, the most prominent of which, of course, has been the die-cast aluminum separator so well-known in the various arts and industries in which it has been employed. The new separator, a one-piece steel separator, will be known as the "Ribbon" type. This separator is formed from a one-piece, patented, unit sheet steel stamping, drawn and formed without joints, welds or rivets in its construction. The separator itself is heavily corrugated and ribbed on one side for added stiffness, and finished in gunmetal blue; is light in weight and frictionless.

Its use permits of normally grooved raceways of deeper cross-section than any other make. Its correct radius lines thus adding enormously to the lateral wall strength of the inner and outer raceways.

The radius of curvature of the raceway on the inner race is made somewhat smaller than that of the outer race, since looking at both races sideways, the outer race curves in a manner concave to the ball and the inner race convex; the outer race, therefore, encloses more of the ball than does the inner race.

The four illustrations show the construction and also show the complete assembled bearing. There are a whole lot of advantages justly claimed for this new form of construction which has been under test and actual use for over a year, and one of the main features of the bearing with the new separator is that it permits of unlimited high speed and vibration, besides which the retainer cannot be affected by heat.

The new retainer permits the use of larger balls, and in many of the sizes, a larger number of balls, which has always been a predominant feature of F. & S. ball bearings of every type on account of their transverse side entrance ball filling slot construction on the inner and outer rings on one side.

The bearings are made in standard ball-bearing sizes, interchangeable with other makes. They do, however, differ from others, in having a higher load carrying capacity and greater endurance, due to the larger number of balls contained in the bearing.

This statement of the quantity of balls used, however, does not hold in all the sizes, since this "Ribbon" type of separator requires the use of an even number of balls, and hence in the design in sizes where an odd number of balls was previously used, it has required a negligible decrease rather than an increase in the number of balls; but as the load capacity of the bearing varies as the square of the ball diameter, and directly with the number of balls, it is obvious that an increase in the diameter of the balls more than compensates for the slight decrease in their number. In many of the sizes, increase in load capacity runs as high as 30 per cent. The "Ribbon" type of separator also permits of a much freer circulation of the lubricant, and lessens the probability of foreign particles being retained in the separator. It is also true that the new type of ball bearing operates even more quietly than does the aluminum type of separator.

A self-aligning type of radial bearing has also been added to the line. This type consists of a standard bearing with a spherical surface on the outer race, and the addition of a washer with a spherical inner surface. This permits of adjustment in case of shaft deflections.

On account of recent large additions to the already great plant, F. & S. are now able to produce special bearings to inch dimensions, or other special constructions, without interfering with their standard production. It may be of interest to note that a recent official accountant's tabulation of outputs developed the fact that over 50 per cent. of the ball bearings produced in the German Empire were manufactured by Fichtel & Sachs.

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'HIS VALVE

scientifically built to overcome ree common valve troubles

Pitting of the Seat

Cast iron—the best known material for a valve seat—as applied on this valve minimizes pitting. The service life is thus increased 200 to 300 per cent.

Warping of the Head

The properly heat treated steels used in the head of the valve will stand the high temperature of the gas engine cylinder without warping.

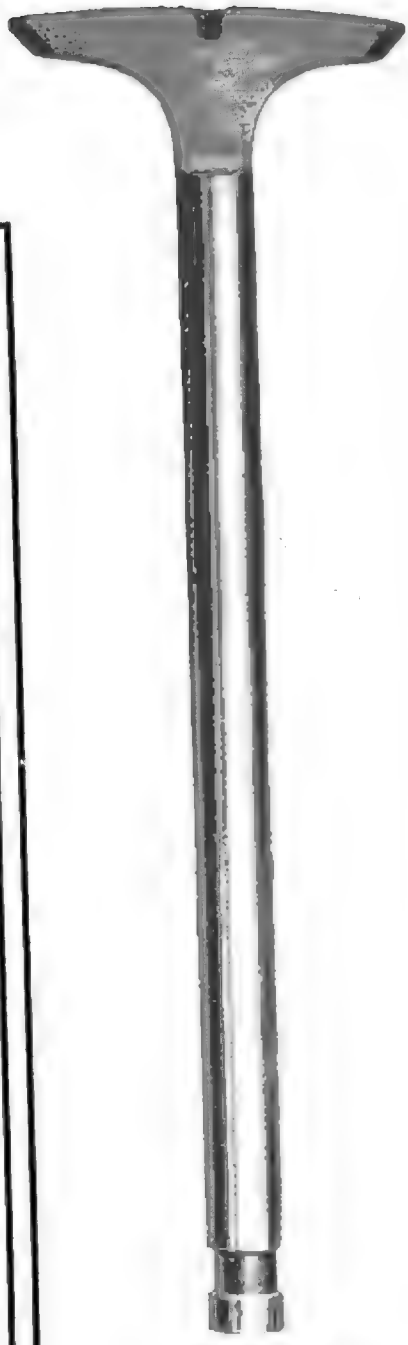
Fatigue and Breakage of the Stem

Low carbon steel is used for the stem because experience proves that the hammering action of the cam shaft will not break it.

It has required years of experience and experimenting to find the materials best fitted for such valves.

It requires expert knowledge of welding processes to unite them in one solid piece.

Considering these things and the service these valves will render they are the least expensive in the long run. The saving of one regrinding will more than pay for the valves.



CROSS SECTION

Cross section of the valve head showing the cast iron seat.

The head is first electrically welded to the stem. The cast iron is then welded to the head by the oxy-acetylene process forming a cast iron alloy around the seat of the valve.

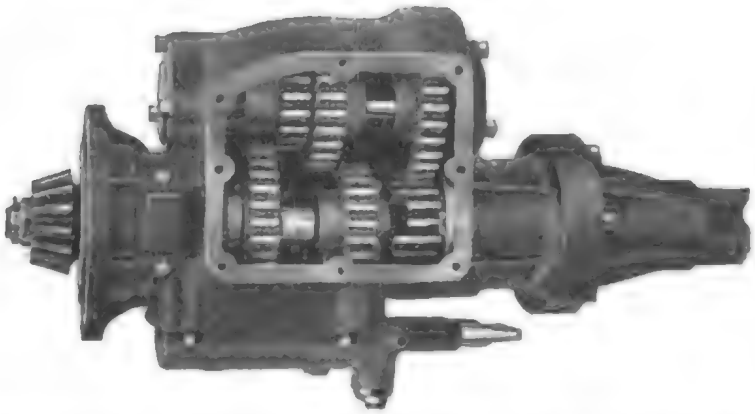
The Electric Welding Products Co.

CLEVELAND, OHIO

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COVERT

Covert Recognized Because Specialized



This year many more leading models show Covert Rear Axle Transmissions and Covert Jackshaft Transmissions, than ever before. There must be merit to warrant this growing popularity.

Fourteen years ago we exhibited the first Rear Axle Transmission. Our confidence in the advantages of this construction, at that time, has been justified by its converts, including many of the leading engineers in this country and abroad. These advantages apply with equal force to the manufacturer, and the man who operates the car.

We maintain a staff of able engineers, who will gladly go over your transmission problems with you.

We specialize on Transmissions designed for direct attachment to rear axle or jackshaft, and practically all the leading manufacturers of those parts carry a complete line especially designed to take Covert Transmissions.

Your 1914 plans are now before you. Let us show you the advantages of Covert construction.

Covert Motor Vehicle Company

Sales Office: Ford Building, Detroit, Mich.

Factory: Lockport, N. Y.

COVERT

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The Largest Automobile Supply House in America

WE WILL EXHIBIT

at the

AUTOMOBILE AND MOTOR BOAT SHOWS

We are now collecting data for our 1913 Annual Catalog, which will contain 256 or more pages and will have a circulation of not less than 100,000 copies throughout the world.

Manufacturers of ACCESSORIES, who are making Parts, Fittings and Sundries for use on Automobiles, Motor Boats, Motorcycles or Aeroplanes, are requested to send us catalogs or circulars and make us a proposition regarding cataloging and handling their material, and, in quoting us, please take into consideration the fact that we have **Fourteen Branch Stores** and quote our prices F. O. B. Each Branch.

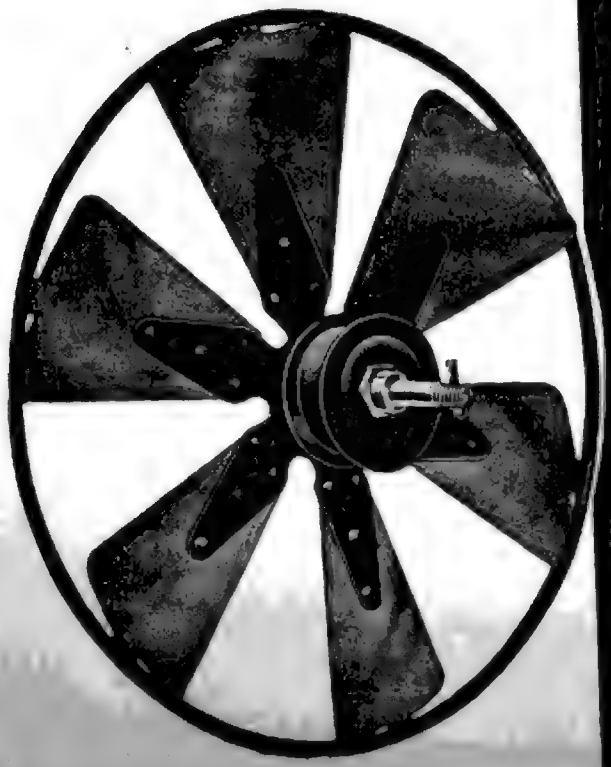
Catalog Mailed to Anyone on Request

CHAS. E. MILLER, Home office **97-99-101-103 Reade St., New York City**

MANUFACTURER, JOBBER, EXPORTER AND IMPORTER

Order from Nearest Branch, Address Chas. E Miller.

NEW YORK CITY—97-103 Reade Street.
NEW YORK CITY—924 Eighth Avenue.
NEW YORK CITY—2782 Broadway.
BROOKLYN, N. Y.—1421 Bedford Avenue.
BUFFALO, N. Y.—824 Main Street.
ALBANY, N. Y.—135 Central Avenue.
CLEVELAND, OHIO—1820 Euclid Avenue.
BOSTON, MASS.—202-204 Columbus Ave.
HARTFORD, CONN.—274 Trumbull Street.
DETROIT, MICH.—227-229 Jefferson Ave.
ATLANTA, GA.—250 Peachtree St.
PHILADELPHIA, PA.—318 North Broad St.
NEW ORLEANS, LA.—601-603 Baronne St.
NEWARK, N. J.—274 Halsey Street.
SPRINGFIELD, MASS.—Bridge and Dwight Sts.



1000 Daily

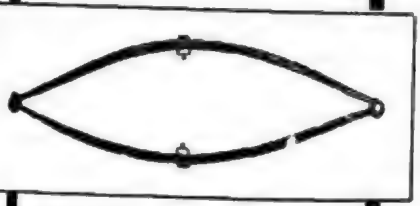
One-Piece Blade Radiator Fans

Protect yourself where deliveries are assured, quality right and a saving made because of an assortment of standard parts from which you may draw.

We Are Fan Specialists

The Sparks-Withington Co.
JACKSON, MICH. and WALKERVILLE, CAN.

Penn Springs



Penn Spring Works

BALDWINSVILLE
NEW YORK

PENN SPRINGS are tested for resiliency and tensile strength far beyond any point that could be reached in every day service. They are guaranteed against fatigue and through the special grades of steel and methods of construction they will give service "plus."

Car manufacturers can make our engineering force part of their organization in the work of producing springs that are true in even load carrying, resilient and engineered to fit the particular car for which they are designed.

Positive recording is insured by the direct drive of the improved shafting of the



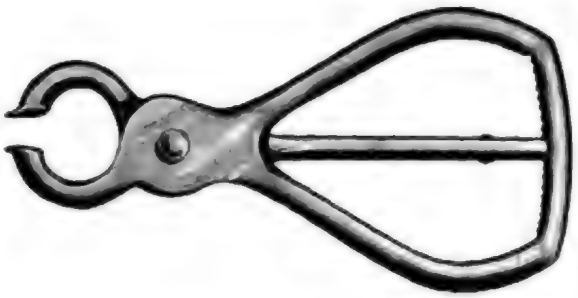
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The links, while practically indestructible, are also interchangeable so that, if perchance one should break, it can be quickly and easily replaced by anyone.

Sold by leading garages and accessory dealers everywhere

Write to-day for catalog and Price List

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Mr. Car Manufacturer

You can guarantee your car mechanically but you do not protect the purchaser on tires.

A few cents judiciously expended for Gilmer Tire Repair Pliers as regular equipment will save the buyer of your car hundreds of dollars.

All manufacturers of motor cars realize that the real item of up-keep is tires, for it is an acknowledged fact that the best set of pneumatic tires may be cut or bruised in the first hundred miles of service, and injured rubber leads straight to the inevitable blow out. Hundreds of good tires are discarded daily before they have given 50 per cent. service.

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Let's get together on your 1913 equipment. A complete Gilmer set with every car you manufacture represents but a few cents extra expenditure per car: may I quote you in quantity?

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51 of 93

Makers of cars exhibiting at the New York Shows had Bosch-Equipped cars on view—14 other makers of ignition divided the balance.

No argument, no proof, no claim is so thoroughly convincing as is the showing of universal selection—the greatest engineers of the industry acknowledge the superiority of Bosch—the extensive adoption of this method of ignition is the zenith of supremacy proof.

For 1913 Be Satisfied Specify Bosch

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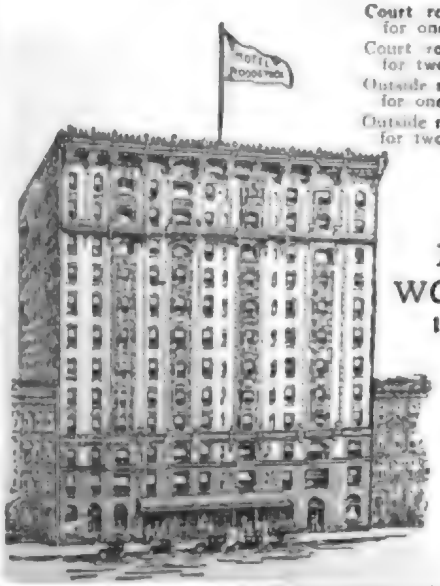
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View from Seat

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Chosen by America's Leading Manufacturers

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We ship over 13,000 Remys monthly.

This is an expression of the confidence of this country's foremost manufacturers in Remy Magnetos and the facilities of the Remy plant in Anderson, Indiana.

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Exchange your old magneto (any make) for a new 1913 Remy; it will cost you practically no more than repairs on your present ignition system.

The Remy Electric Company, Anderson, Indiana

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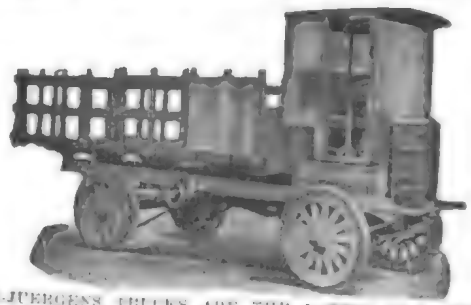
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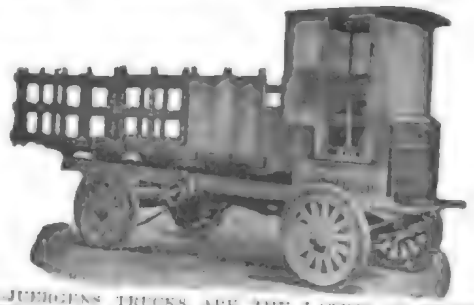
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LAUTH-JUERGENS TRUCKS ARE THE LATEST IN CONSTRUC- tion, most powerful in operation and the motors are guaranteed against defective workmanship and material for the life of the truck. They are practically the highest class Stoeker made. Four cylinder opposed, ball bearing transmission same as our 40-60 H. P. Four speeds forward. Herringbone steel throughout. Low chassis, covered by patents owned by us. Send for 1912 catalog and specifications. Prompt delivery on all models. Large publicity campaign just begun. Our quality will do the rest.
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The One Mechanical, Never Failing Warning Device

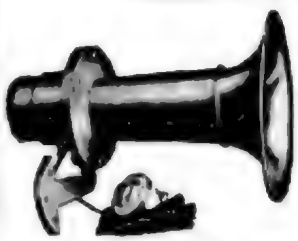
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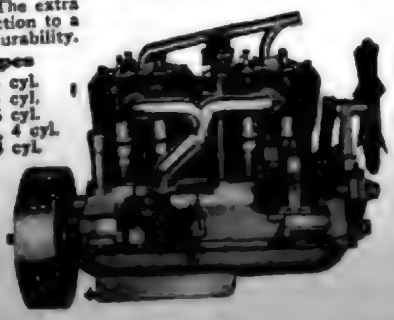
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The crank shaft is of large diameter—a self-contained oiling system supplied by a gear pump through the hollow crank shaft provides perfect oiling. The extra large bearings reduce friction to a minimum and increase durability.

All 4 Cycle—in 5 Types

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INTERLOCK INNER TIRES
Stop Tire Troubles

The one weak point of the automobile is that you cannot depend on the tires. Thousands of motorists have solved their tire problem by discarding inner shoes, reliners, fillers and other makeshifts and equipping their tires with **Interlock Inner Tires.**

Interlocks are complete inner tires (not inner shoes) placed between the outer casing and inner tube to strengthen the casing and protect the tube from punctures. They double the mileage of new tires and add 1,000 to 5,000 miles to old ones—save half your tire expense—and make tires trouble proof.

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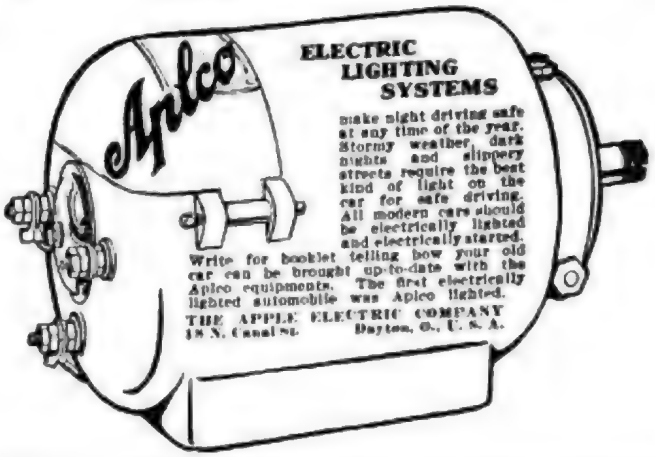
Mighty Michigan "40"

40-Horsepower Touring Car or Roadster, absolutely silent in operation. Oversize tires 35 x 4½—cylinders 4¼ x 5¼ in.—118-in. wheelbase—four-forward-speed transmission—demountable rims—nickel mountings—massive, straight-line body—big, roomy seats—electric lighting by generator—everything. Price $1585, includes full equipment. Two smaller models. Catalog on request.



MICHIGAN MOTOR CAR COMPANY

[130] Kalamazoo, Mich.



Another Victory for Staver

Staver 55 was the only touring car to finish the exacting "Round Lake Michigan" reliability run with a perfect score—repeating its victory in the contest of the preceding year.

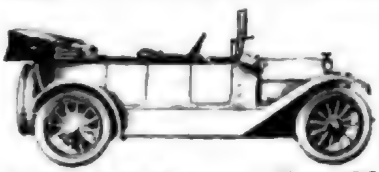
Larger Output—Three Splendid Models

For 1913, we are concentrating on three great models—Staver 55, Staver 45 (our competition crushing forty), and our big Staver Six.

Staver cars are roomy, luxuriously upholstered, up to the minute in equipment. Backed by Staver durability, they are the biggest value on the market.

STAVER CARRIAGE CO., 76th and Wallace Sts., Chicago

Type 35
Series
G and H



Electric
Lighting and
Starting

MERCER

The Champion Light Car

Mercer power and efficiency are well-known qualities. These features are decidedly emphasized in our new series. The various models offer a Mercer for every reasonable need.

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Rupmobile "32" Touring Car, Fully Equipped, $975 F.O.B. Detroit

Long-stroke motor, 3½ x 5½ inches. Enclosed valves. Three bearing crank shaft. Unit power plant. Multiple Disc clutch. Three speeds forward. Sliding gears. Full floating axle. Center control. Zenith carburetor. Bosch magneto. 106-inch wheelbase. 32 x 3½ inch tires. Quick detachable rims. Mohair top with envelope. Jiffy curtains. Windshield. Rear shock absorber. Prest-O-Lite tank. Gas headlights. Oil side and tail lamps. Tools—horn. Trimmings, black and enamel. Standard color, black. Magneto and camshaft driven by silent Coventry chain.

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Chassis and specifications same as Touring Car. Large turtle back dust proof compartment for extra accessories, tires and baggage.

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Chassis same as Touring Car. Enclosed panel body. Two cushioned lazy-back seats. Carrying capacity, 800 lbs. Chassis and body painted black, high-class finish. Two-piece windshield. Prest-O-Lite tank. Gas headlights. Oil side and tail lamps. Quick detachable rims. Tools—horn. Trimmings, black and nickel.

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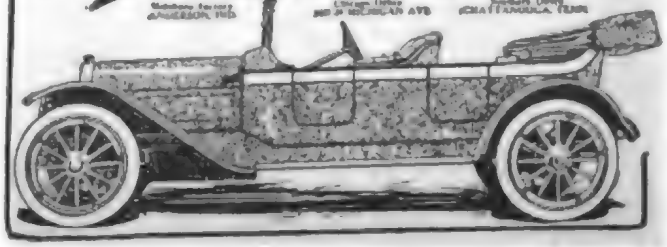


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WASHINGTON PA.

Nyberg SIX $1750

ANNOUNCING 1913 TOURABOUT
Complete Specifications Sent on Request

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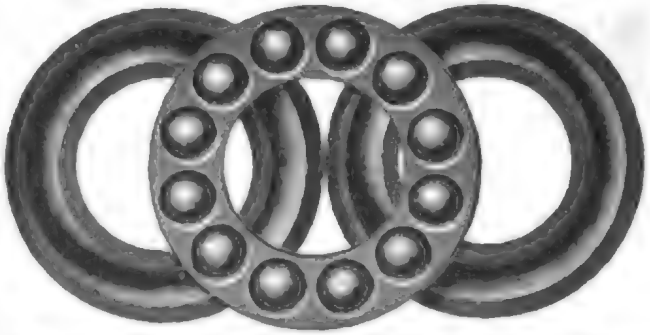
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TOLEDO, OHIO

Manufacturers of Auto Parts,
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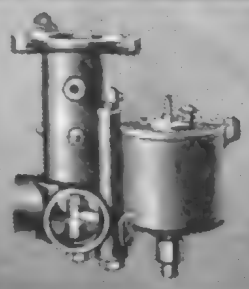
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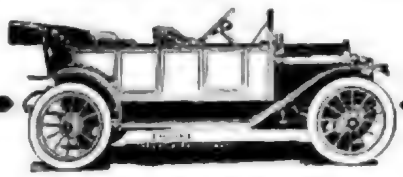
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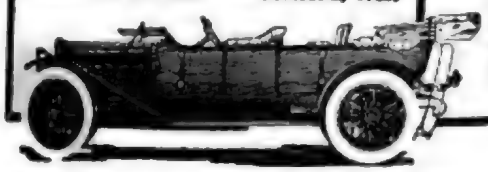
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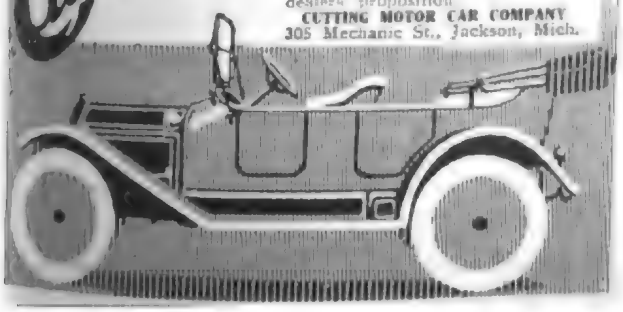
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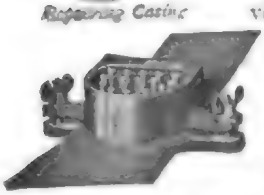
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Patented

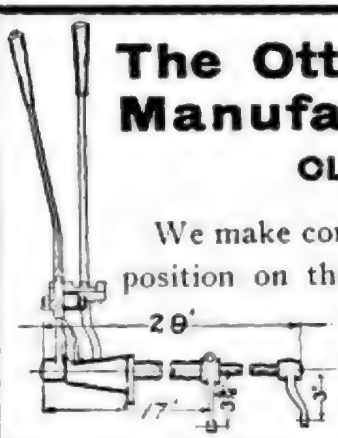
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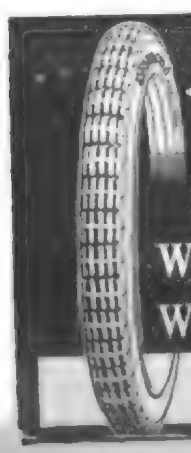
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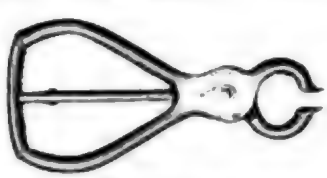
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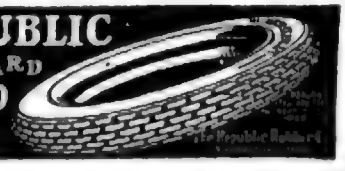
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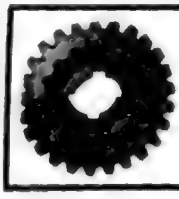
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A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

"FORD Model T Reference Book" gives cause and cure of all the ails of Model T simply and concise. Gives the latest kinks. Full of pointers. Written especially for it. Elaborate cross index enables you to discover any trouble at once. Write for descriptive circular or sent postpaid, $1.00. FORD REFERENCE BOOK CO., 57 West 125th St., New York.

SIMPLEX 90, with touring and racing equipment in A1 condition. Cost $7,500. For sale, $2,000. J. A. FORSYTHE, JR., 350 E. Forsyth St., Jacksonville, Fla.

ALUMINUM vulcanizers for both casings and tubes. $3.50 prepaid to any address. Money back if not satisfactory. TRUSCOTT SUPPLY CO., St. Joseph, Mich.

FOR SALE—Cheap, one American Traveler, color battleship gray; just like new; run a little over 4,305 miles. MICHIGAN AUTO CO., 410 7th St., Calumet, Mich.

FOR SALE OR LEASE—The most modern garage in Southern Colorado, with fine repair shop and storage room for sixteen cars, doing good business and fine prospects for coming year. A snap for someone. Address BOX 208, Monte Vista, Colo.

LOT in Velasco, Texas, for automobile or motor boat; paid $1,000 20 years ago. TOM CHILDRESS, R. F. D. No. 2, Arlington, Texas.

FOR HIRE—White 1½-ton truck by week. CHAS. HONEHEIN, 2027 3rd Ave., New York City.

ADVERTISER has choice free and clear building lot in a high class residence suburb of Newark; would like to exchange for medium priced automobile; give full description. Address EXCHANGE, 1101 World Building.

SITUATION WANTED, with accessory manufacture or supply house, by young, energetic man, thoroughly experienced in the wholesale, retail and mail order supply and tire business. Good salesman and buyer and thoroughly competent as correspondent, advertising and catalog man. Would like to connect with a good, reliable concern. Address BOX 999, care Motor World.

HAVE had 13 years' experience in organizing, handling, selling and advertising campaigns. Would develop your selling force or open up new field. BOX 169, Motor World.

WANTED—Salesman for agencies in every city to install new process in demand, showing over 300% profit to garages, supply dealers, breweries. Entirely new, big seller. This means big money. Experience not essential. H. J. WEBER, South Orange, N. J.

FORTY ACRE FARM, clear, Brown County, Indiana, N. E. ¼ of S. W. ¼—23-8-3—$800. Want late model car for it. LOCK BOX 78, Hector, Minn.

SURPLUS STOCK BOUGHT
Cars, Bodies, Tops, Tires, etc.
Cash transactions. Quick business.
20TH CENTURY CO., 1700 B'way, N. Y. C.

APPLY Boyer's Automatic Refinisher to your automobile today. Tomorrow it will look as though it just came from the factory. Finest thing in the world for dull hoods. Easily applied with cheesecloth. Particulars free. BOYER CHEMICAL LABORATORY CO., State and Michigan Sts., Chicago, Ill.

PEERLESS EXTRA FINE BLACK JAPAN.
Covers solid one coat for enameling lamps, radiators and fenders. No undercoat required. Heat does not affect it. Ask your garage and supply dealer.
The Columbus Varnish Co., Columbus, O.

FOR SALE—Seven passenger Oldsmobile, in fine condition; will sell cheap for cash or trade for small touring car. C. R. AMBUHL, 931 Liberty Ave., Pittsburgh, Pa.

FOR SALE—Garage, fully equipped, within 50 miles of New York City. Two-story brick building, steam heat, 1,000-gal. gas tank, full stock of oils, greases, supplies and accessories. Agency for two standard non-competing cars. Storage for 35 cars. This is a rare chance for a live man. Ill health of owner reason for selling. Address Motor World, Box 241.

PEERLESS LINING DYE.
Dyes the cloth linings of tops and curtains a black, uniform color, covering up water stains and grease spots. Does not wash off. Ask your garage and supply dealer.
The Columbus Varnish Co., Columbus, O.

VICTORIA TOPS AND SEAT COVERS
That's our specialty, but we make a full line as well. Any style and every one the best that high-grade materials and experienced workmen can make. Prompt service assured. We're glad to estimate special work or quote you prices on stock tops. CENTRAL AUTO TOP CO., Indianapolis, Ind.



An ad. like this will cost you $1.35 for each insertion.

These columns offer you an opportunity to appeal to an audience of 8,000 readers whose merchandising taste is being cultivated

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For Sale—Wants—Exchange

15 cents per line of six words, cash with order. — In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

WANTED—A high class draughtsman, having had motorcycle experience. In making application state previous experience and salary expected. THE POPE MFG. CO., Westfield, Mass.

PEERLESS AUTO TOP DRESSING.
A waterproof dressing for leaking mohair and duck tops and curtains. Makes old and faded tops look like new. Ask your garage and supply dealer for it.
The Columbus Varnish Co., Columbus, O.

FOR SALE—1910 Peerless limousine; newly done up and relined; price $2,000. 1730 Land Title Bldg., Philadelphia, Pa.

AUTOMOBILE FOR SALE—1912 Marmon Speedster, Indianapolis Speedway type car. A-1 condition; run 4,000 miles. For particulars apply W. F. BURROUGHS, 66 Midland Ave., Arlington, N. J. Tel. 29 Arlington.

WANTED TO BUY—Five or seven passenger automobile for cash, in good condition; no dealers. 172 Pacific St., Brooklyn, N. Y.

BARGAIN—Two new and never used 34 x 4 Davis Armor, Model B, Tire Protectors; cost $54.00. Will take $32.00. Disposed of car before "Armors" arrived. BOX 231, care Motor World.

AUTOMOBILE CYLINDERS reground, new pistons and rings fitted. Garage air compressors. CAST IRON BRAZING CO., Manchester, N. H.

1913 PACKARD—Will dispose of my new 1913 6-cylinder, 7-passenger touring car at a bargain if taken immediately. Address H. M. WALLIS, JR., Racine, Wis.

PEERLESS LEATHER TOP DRESSING
An oil preparation that softens the leather and pantasote. Makes old tops look like new. Ask your garage and supply dealer for it.
The Columbus Varnish Co., Columbus, O.

OLDSMOBILE: 4-cylinder; 5 passenger; good tires; equipped; good condition; looks good; $450; cost $3,000. FARQUHAR, 103 Mott St., New York.

AUTO LISTS, owners, etc., of any State. S. H. CARROLL, JR., Albany, N. Y.

ARE YOU in need of any additional help in any department of your business? Are you out of employment or looking for a better connection? Have you second-hand apparatus of any kind or do you want to buy second-hand material. Have you a factory site for sale or do you want to buy one? If so, use the Want and For Sale column of the Motor World. Seven words to the line, fifteen cents a line. Advertisements can be inserted over a number when it is desired and identity of the advertiser will be kept confidential

PEERLESS BACK AND CUSHION DRESSING.
Softens the leather and will not crack, wash or rub off. Makes old leather look like new. Dries in twenty minutes. Ask your garage or supply dealer.
The Columbus Varnish Co., Columbus, O.

BROKEN Cylinders and Crankcases—Send them to be made good as new at fraction of replacement cost. Scored cylinder repaired, $12. No new piston and rings required because bore is not enlarged. Where cylinders are worn (not scored from loose wrist pin) reboring is only remedy. We do it expertly. Write for complete information and estimates. WATERBURY WELDING COMPANY, Waterbury, Conn.

WANTED—A first-class man to take the agency for the latest invention on the market, a rubber cover for automobile handles called Steerease; write for full particulars. Address DEPARTMENT E, GOODYEAR RUBBER HOSE AND PACKING CO., 221 Chestnut St., Philadelphia, Pa.

FOR SALE—1908 Winton touring car, 7-passenger, good running order, fully equipped; price $400. Address BOX 230, Motor World.

RURAL Parcels Post Delivery Car—Any party with capital and push interested in placing one on the market, correspond with E. P. COWLS, Sparta, Mich.

PEERLESS EXTRA FINE BLACK BAKING JAPAN.
Bakes either to a high gloss finish, egg-shell gloss or dull finish on lamps, radiators and fenders. Will not crack, chip or peel. Ask your garage and supply dealer.
The Columbus Varnish Co., Columbus, O.

BROKEN CRANKSHAFTS, cylinders, crankcases, flywheels, gear teeth, pistons, perfectly welded and machined ready to replace. Guaranteed and references. Machinery up to 5 tons welded. ATLAS WELDING WORKS, 74-76-78 Irving St., Rahway, N. J.

FOR SALE—One Ford town car body. Fits any Model T Ford chassis. BENNINGTON GARAGE, Bennington, Vt.

AR-GEN-TOR will deposit a beautiful silver plate on your brass trimmings in one minute. Absolutely reliable. Price $1.00. Send for package. Quit polishing brass. FOREST CITY SALES CO., Fremont, Neb.

weekly to the highest degree by our articles on "Wide Awake Merchandising." Look at the cost as shown in the margins.

An ad. like this will cost you 60c. for each insertion.

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Cadillac STANDARD OF THE WORLD

Cadillac STANDARD OF THE WORLD

Four years ago we recorded a prediction

Four years ago we foretold in our advertisements as reproduced in the appended column, that:—

Ultimately the Cadillac Motor Car would find its way into the hands of hundreds of owners who had theretofore paid twice and thrice as much money.

You must be conscious that the prophecy is being fulfilled; that the "hundreds" predicted is being realized in "thousands."

The prediction was not made in a spirit of vainglory.

Nor is its realization recorded now with any special sense of elation.

But the simple fact is interesting, and highly creditable.

Creditable, we mean, to the discernment of the American business man.

It is not easy to resist the glamor of the highest dollar-mark.

It is not easy to believe that equal or greater excellence can be found at a lower price.

But that is precisely what has happened in the case of the Cadillac.

We felt four years ago that it must happen.

We were sure that no manufacturer could have higher ideals; or adhere more rigidly to those ideals.

The basis of a car's worth, of course, is the engineering practice and the factory practice which govern its construction.

That is the first excellence you strive to obtain when you pay the highest price.

And that was precisely the point in which the Cadillac was awarded world's precedence by the Royal Automobile Club of London.

We knew that in practice—close measurement, standardization, alignment, proportion—the Cadillac was not an aspirant but actually a leader.

We knew, in other words, that it was not surpassed; and that it was not even equalled in that respect.

And we knew, too, that that which went into the car could not be better.

We had no thought of emulating cars of higher price.

We were wholly engrossed in making the Cadillac the best of cars.

So, the fact that our prophecy has come true is an incidental, although an important result.

It has happened because we began with the positive conviction that—given a production of adequate size—no higher price than the price of the Cadillac was necessary for the highest type of motor car.

Surely your own Cadillac experience, the experience of every Cadillac owner in your community—and, indeed, of every Cadillac owner you have ever met anywhere in the world—justifies it.

The Cadillac is now the choice of thousands who were once wedded to cars of the highest price.

They have abandoned the recognition of the dollar-mark as the symbol of highest value.

It is one of the most interesting things that have occurred in motor-car history—one of the most significant signs of enlightenment in buying that has occurred in latter-day America.

The Prediction

Reproduced from Cadillac advertisements of December, 1908

Ultimately the Cadillac will find its way into the hands of hundreds of owners who have heretofore paid twice and thrice as much money.

The deep-rooted conviction which these men naturally cherish—that there must be something lacking in the Cadillac to make such a price possible—is one which the Cadillac Company is eager to encounter wherever it can be found.

To meet and defeat that impression by practical demonstration during the ensuing season is of vastly more importance than the mere matter of sales.

The latter problem has been disposed of by a demand from dealers which has exhausted an output of ten thousand cars; and driven the factory to exert its fullest continuous capacity night and day.

Of infinitely greater moment, as affecting the well-being of the Cadillac Company a year from today, and ten years thereafter, is the establishment of the principle that a high-powered car, of the highest grade, can be built to sell at a popular price.

Stripped to the chassis and subjected to the jealous scrutiny of experts in material and in mechanics; matched part against part, down to the last detail, with cars of known integrity sold at the highest market figure, the Cadillac will prove beyond question that such a car can be built at such a price.

But your investigation, proving that the Cadillac Company has made the impossible possible by heroic means and methods, will likewise demonstrate this, that

HIGH-POWERED CARS EQUAL TO THE WORLD'S BEST CAN BE BUILT TO SELL AT A POPULAR PRICE IN ONLY THE ONE FACTORY WHICH IS FITTED BY EXPERIENCE AND EQUIPMENT TO UNDERTAKE THE TREMENDOUS TASK.

STYLES AND PRICES

Standard Touring Car, five pass.			$1975.00
Six passenger car.	$2075.00	Roadster, two pass.	$1975.00
Phaeton, four pass..	1975.00	Coupe, four pass...	2500.00
Torpedo, four pass..	1975.00	Limousine, 7 pass..	3250.00

All prices are F. O. B. Detroit, including top, windshield, demountable rims and full equipment.

Cadillac STANDARD OF THE WORLD

Cadillac Motor Car Co., Detroit, Mich.

Cadillac STANDARD OF THE WORLD

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KLAXONIZED

These 48 cars are Klaxonized:

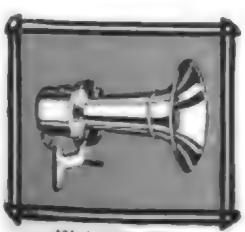
A. E. C.	**F. I. A. T.**	**Packard** (Special)
Aleo	**Flanders**	**Pope Hartford**
Armleder	**Hudson** (Special)	**Pierce-Arrow**
Autocar	**King**	**Pratt**
Babcock Electric Roadster	**Knickerbocker**	**Schneider** (European)
H. H. Babcock	**Knox**	**Simplex**
Bailey	**Lancia** (European)	**Staver**
Benz	**Lozier**	**Stearns**
Borland Electric	**Marmon**	**Sternberg**
Broc Electric	**Matheson**	**Stevens-Duryea**
Charon (European)	**Metallurgique**	**Stoddard-Dayton**
Chicago Electric	**Multiplex**	**Touraine**
Church-Field Electric	**National**	**Guy Vaughn**
Cole (Special)	**Oakland**	**Walker Electric**
Columbia	**Oldsmobile**	**Ward**
Davis	**Orson**	**White**

IN this list of Klaxonized cars, you will note an *almost* complete line-up of the high-grade automobiles.

What does this mean?

On the face it simply shows that all of these cars go forth today equipped with Klaxons. But back of that it means that these manufacturers are determined to have their cars equipped to the highest degree of safety and comfort; and to that end they provide the best accessories obtainable—the *standard* ones.

Deeper still, it means, that in the opinion—*practically unanimous*—of the car manufacturers of this country and Europe, the bulb horn is neither sufficient nor efficient, and that the *one* dependable, adequate, safe, signal is the *standard* Klaxon.



KLAXONET

Lovell-McConnell Mfg Company Newark, N.J. U.S.A.

KLAXON

"The Public Safety Signal"



KLAXON

Studebaker

Seats Six Passengers--Started by Electricity--Lighted by Electricity

The Studebaker "35," for $1,290, is the Biggest Value You Can Offer

A car that has set a high water mark for efficiency, looks, and luxurious appointments.

Compare it with cars that sell for $2,000 or more.

Two passengers in the rear seat, two in folding seats and two in front spells comfort.

A Studebaker "35" sells on sight.

The long rakish body, the sumptuous upholstery and the perfection of detail wins favorable comment.

The electric self starter---which will turn the motor over eighty times a minute for 31 minutes by simply pulling a handle on the steering column---and does it every time---is a strong selling point.

And the high quality, good looking electric lights appeal to the man who wants the last thing in touring comforts.

Then there's the long stroke accessible motor---better than 35 H. P.

The full floating rear axle eliminates any possibility of axle trouble.

Note the extraordinary comfortable springs, semi-elliptic front, three quarters-elliptic rear.

And the complete, up-to-dateness of the equipment.

No other car like it at the price---$1,290.

STUDEBAKER CARS

"20" Delivery Car	$800	"30" Touring Car	$1190	"Six" Touring Car	$1550
"20" Roadster	835	"35" Touring Car	1290	"Six" Roadster	1550
"25" Touring Car	885	"35" Sedan Type	2050	"Six" Limousine	2500
		"35" Coupe	1850		

All prices for cars fully equipped F. O. B. Detroit

THE STUDEBAKER CORPORATION

DETROIT, MICH.

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MOTOR WORLD

A Trade Paper Giving the World's Motor New

Vol. XXXIV
No. 7

New York, February 6, 1913

Ten cents a copy
Two dollars a year

To a man who KNOWS good varnish, this trademark is sufficient praise for any car that has been finished with Berry Brothers Automobile Varnishes and Baking Enamels.

To any man who is NOT a varnish expert, the results on any car finished with Berry Brothers Automobile Varnishes and Baking Enamels are immediate optical proof that the best materials were used.

BERRY BROTHERS'
CELEBRATED
TRADE MARK
BRILLIANT. DURABLE.
UNEXCELLED
VARNISHES
DETR



Every dealer who supplies cars finished with Berry Brothers Automobile Varnishes and Baking Enamels has a tremendous help in making sales — the reputation of Berry Brothers, the favorable first impression of the car, and the permanency of that impression.

BERRY BROTHERS
Established 1858
The World's Largest Varnish Makers
DETROIT, MICH.

Published Weekly by the Motor World Publishing Company, 1600 Broadway, New York

Helps You Meet Competition

Inclusion of the Truffault-Hartford Shock Absorber in a car's regular equipment enables both manufacturer and dealer to meet competition more successfully.

The manufacturer who equips his car with the Truffault-Hartford offers a bigger value for the money than would be possible without this unique device. This shock absorber adds to the value of any automobile because it makes a car comfortable—reduces up-keep cost—insures safety—helps an owner to get the most out of his car. The

Truffault-Hartford SHOCK ABSORBER

is now so generally recognized as absolutely necessary to a car's proper performance that 23 leading manufacturers include it as factory equipment with every car they turn out and the car YOU sell should be equipped with it.

Sold on a guaranteed-to-give-satisfaction basis, the Truffault-Hartford never fails to stand up to its work. Our generous agency terms will appeal to a progressive dealer. Write us today for details.

Hartford Suspension Company

EDW. V. HARTFORD, President

Factory, 164 Bay Street, Jersey City, N. J.

BRANCHES:

NEW YORK—1700 Broadway
NEW YORK—212-214 West 88th St.
JERSEY CITY—141-143 Morgan St.
BOSTON—319-325 Columbus Ave.
CHICAGO—1458 Michigan Ave.
DETROIT—803 Woodward Ave.
KANSAS CITY—1524 Grand Ave.
NEWARK—289 Halsey St.
PHILADELPHIA—1437 Vine St.
INDIANAPOLIS, IND.—448-450 N. Capitol Blvd.



Firestone
NON-SKID TIRES

THE confidence felt by Firestone users explains the widespread choice of Firestone Non-Skid Tires.

Confidence in the secure road grip of "NON-SKID" sharp edges, abrupt angles and deep, vacuum-creating hollows.

Confidence in the ability of these tires to take the car safely over rain-soaked asphalt, or through mud or slush;

Confidence in the builder, who is ***personally*** responsible for every tire—the man with whom quality has been a habit for over twelve years;

Security greater than that of any other tire or mechanical device, without the shortening of tire life and ruining of the road which such devices incur;

Economy of longest tire wear, smallest gasoline consumption, greatest car protection;

Comfort of riding by means of extra thick, unusually resilient tread.

These are the ***extra values*** every Firestone user buys. Specify these Non-Skid Tires for your car.

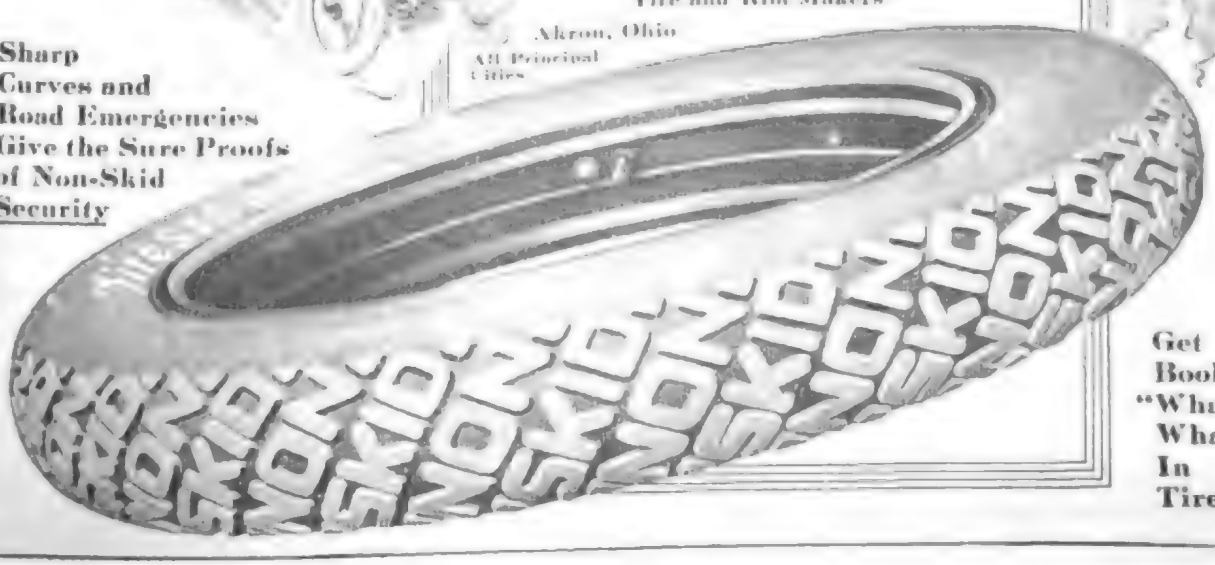
Get Book "What's What In Tires," By H. S. Firestone.

The Firestone Tire and Rubber Company

"America's Largest Exclusive Tire and Rim Makers"

Akron, Ohio

All Principal Cities



Sharp Curves and Road Emergencies Give the Sure Proofs of Non-Skid Security

Get Book "What's What In Tires"

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The Atwater Kent Ignition System



Time was when automobile engineers and the general motoring public thought they must equip their cars with a magneto. Today this idea is fast waning—in fact, it has been discarded by many of the foremost automobile engineers and discriminating motorists who are now demanding a more dependable source of current on their cars.

The increasing use of electric lighting and starting equipment necessitates an ignition system better than the magneto—a system producing a uniformly hot spark at low speeds as well as high—a system giving a hot starting spark with the motor at a standstill—a system that is simple in principle and mechanism as well as in operation, and reasonable in initial and maintenance cost—in brief, a system of ignition that will measure up to the highest requirements of the most modern automobile practice.

Such is the Atwater Kent Ignition System—embodying the best features of both magneto and battery, without the weaknesses of either.

Remember the Atwater Kent System can be easily and quickly installed on any standard make of motor, new or old, without the price of a magneto.

If you have an unsatisfactory magneto, or if your motor is not equipped with a half time shaft, you can use the Atwater Kent System by means of our magneto gear mounting, the cost of which is nominal.

In addition to our standard Type F System, we are marketing a new model —Silent Type K with automatic spark control and insulated primary circuit.



Whether you are interested in motor cars as manufacturer, dealer, owner, or prospective buyer, you should have a copy of our booklet "D." It covers the subject authoritatively and thoroughly and even the most experienced will find it interesting reading.

ATWATER KENT MFG. WORKS

4940 Stenton Ave. Philadelphia, Pa.

DISTRIBUTORS:

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Chicago.....Pellets Magneto Exchange, Motor Car Supply Co.
San Francisco.....Chanslor & Lyon Co., Weinstock-Nichols Co.
Milwaukee.....Julius Andrae & Sons Co.
Omaha.....Omaha Rubber Co., Powell Auto Supply Co.
Chattanooga.....Sanford Bros.
Dallas.....Fisk Co. of Texas
Denver.....Auto Equipment Co
St. Louis.....Missouri Auto Specialty Co
Salina.....Lee Hardware Co
Kansas City.....Kansas City Auto Supply Co.
Hartford.....Post & Lester Co.
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¶ It is well advertised and there is a constantly increasing demand for it.

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¶ And your interests as a dealer are protected, as we refer inquiries and orders from automobile owners to our dealers. Write for Our Proposition.

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Bering Tire & Rubber Co., Houston, Texas
Todd Rubber Co., New Haven, Conn.
Atkinson Tire & Supply Co., Jacksonville, Fla.
C. D. Franke & Co., Charleston, S. C.

MOTOR WORLD

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ZENITH ANSWERS STROMBERG AND FILES COUNTER SUIT

Attacks Ahara and Richards Inventions and Their Purchase—Charges Infringement of Zenith Carburetter Patent.

On Friday, January 31st, the Zenith Carburetter Co. of Detroit, Mich., filed its answer to the suit for infringement of the Ahara and Richards patent brought against it by the Stromberg Motor Devices Co. of Chicago, Ill. The next day, Saturday, February 1st, the Zenith company lodged a countersuit against the Stromberg company, in turn alleging infringement of its patent, No. 907,953, granted to Francois Baverey of Oullins, France, on December 29, 1908.

The Zenith answer is for the most part a general denial of infringement, but among the several specific items it is denied that Stromberg carburetters have been marketed with the word "Patented" stamped thereon; and, further, the Zenith people aver that the Stromberg company only recently purchased the Ahara patent, No. 684,662, of October 15, 1901, and the Richards patent, No. 791,501, of June 6, 1905, "for the sole purpose of harassing these defendants." It is also charged that the Stromberg people "conspired to injure" the Zenith interests by making an infringement of the Zenith carburetter in violation of the patent which is claimed to cover the latter.

The Ahara and Richards inventions are attacked on the grounds of lack of novelty and invention, and the answer cites a long list of prior patents. The earliest is No. 62,856, granted in 1867 to Joshua Kidd, and the second, No. 296,340, dated April 8, 1884, to Hiram S. Maxim; Alexander Winton's patent, No. 582,108, of May 8, 1897, is also among those cited.

In its countersuit against the Stromberg Motor Devices Co., which was filed in the Federal court in Detroit, the Zenith Carburetter Co. alleges that the Baverey patent has been infringed since July 1, 1911, and, of course, asks for an injunction and accounting.

The particular Stromberg carburetter which is claimed to infringe the Zenith patents is the "Model E" Stromberg, the manufacture of which the Zenith people assert was undertaken prior to Stromberg's acquirement of the Ahara and Richards patents, which are claimed to cover all the so-called plain tube carburetters.

Bankruptcy Added to Atlas Troubles.

The Atlas Motor Co., of Springfield, Mass., which was sold under a mortgage foreclosure Saturday, 25th ult., to Charles D. Whitney, manager of the Victor Sporting Goods Co., of the same city, at a time when it was negotiating to be taken into the so-called Orson merger, has become involved in further difficulty through an involuntary petition in bankruptcy which was filed in the Federal court in Boston Wednesday, 5th inst. The petitioners are three small creditors whose claims aggregate $1,147.

St. Paul Tradesmen Seriously Injured.

Frederick L. Buchanan, proprietor of the Motor Truck Co., and E. A. Theim, of the Joerns-Theim Motor Co., of St. Paul, both well known in the northwestern trade circles, were seriously injured on Wednesday, January 29th, when a motor truck which Buchanan was demonstrating to Theim, was struck by a freight train. Buchanan was removed to the Cobb hospital, suffering from a fractured skull and in a critical condition; Theim sustained concussion of the brain but was taken to his home.

Paul Smith to Direct Lozier Sales.

Paul Smith, who until December last was sales manager of the Flanders Motor Co. of Detroit, has been appointed sales manager of the Lozier Motor Co. of that city. He succeeds C. A. Emise, who resigned to become a member of the newly organized Chandler Motor Car Co.

WOULD DISCONTINUE THE NATIONAL SHOWS

Albert L. Pope Inaugurates Movement for That Purpose and Finds Quick Response—Potent Reasons Brought to Bear.

Although he had hoped that it would escape the public prints until the movement had attained definite shape, or had been formally considered, it became generally known this week that Albert L. Pope, president of the Pope Mfg. Co. of Hartford, Conn., has taken the lead in an endeavor to eliminate at least the national shows. He expressed his views in a communication, bearing date January 25th, which was addressed to all automobile manufacturers of moment.

In reply to a Motor World inquiry, Pope yesterday stated that of the responses received at least 90 per cent. are favorable to the discontinuance of the shows.

"I think it is about time we came to our senses," emphatically remarked Pope in discussing the subject.

When asked if free-lance promoters are not likely to take up the work immediately the automobile organizations lay it down, and if manufacturers are not likely to emulate sheep in responding to the promoters' wiles, Pope declared that he has no fears on that score if the remedy he has in view is adopted. He prophesied it would be effective, but at this time declined absolutely to say what it is. He added that the matter probably will be discussed at the March meeting of the executive committee of the National Association of Automobile Manufacturers, and until that time he deems it unwise to discuss the plans which he has in mind.

He admitted, however, that Col. George Pope, for many years chairman of the Board of Trade's show committee, and who also is treasurer of the Pope Mfg. Co., shares his

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opinion that shows have outlived their usefulness and have become an evil which seriously impairs business and disorganizes the affairs of each respective manufacturer.

Exactly how Mr. Pope feels on the subject is expressed in his communication broaching the subject which he addressed to the various car manufacturers. It is as follows:

"I have been giving the matter of automobile shows in general a great deal of consideration lately and have thought it over from every standpoint and wondered in my own mind how long this industry of ours could stand such expense as automobile shows in general entail.

"The past week I have been more impressed than ever at the Madison Square Garden show as to the matter of expense, for the automobile industry in general pays for it. Last year I understand gate receipts paid by the public at Madison Square Garden were only 40 per cent. of the total. It is too early at this writing to say what they will be this year, but in all probability they will be somewhat less. The trade in general paying for and giving away the tickets not only pays the rent and decorations, but a large part of the patronage as well.

"The disorganization of your factory and sales department and business in general during the weeks of the show is a serious matter and I think one that will have to be reckoned with in the near future by the automobile industry. The money in addition that is left with the hotels in New York and other cities is another serious point.

"Now, the situation resolves itself right down to this: Can the automobile industry stand the expense of these shows with all its ramifications?

"As soon as the automobile show is in progress of promotion it is merely a signal for all newspapers and publications of every kind to attempt to get from the automobile manufacturers advertising, and this year it seems to me that it has been worse than ever.

"Several prominent men in other lines of business have commented to me in the last week as to the expense of the automobile show and have not hesitated to make the statement that the business they were in could not stand any such expense. I think we are beginning to be seriously criticized by the public, and I feel that it is a question that ought to be discussed thoroughly from all points of view and if for no other reason it should be deemed wise by a majority to discontinue shows, this is the time to take the matter up, because in the very near future the association will be making leases and arrangements for shows in 1914.

"If you feel as I do, that shows should be discontinued, or at least the matter thoroughly discussed by the manufacturers, will you kindly write a letter to the National Association of Automobile Manufacturers, 7 East 42d street, New York, requesting them to call a meeting of their members for a discussion of this matter in the very near future, so that if it is determined that shows be discontinued during 1914 we may be in a position to notify all those who are now interested to discontinue their preparations so far as we are concerned as manufacturers?"

Cleveland Has a $360,000 Fire.

Damage to the extent of about $360,000 was done in Cleveland, Ohio, Friday night, 31st ult., when a four-story brick building occupied by the Judd Automobile Co. and other companies was destroyed and about 300 cars, most of them the property of private owners, were ruined; the blaze started in the Judd establishment, at 1204 Huron road, and 275 of the 300 cars burned were in this company's section of the building. The Judd company, besides operating a garage, is the Inter-State dealer. The Buick Sales Co. sustained a loss of $25,000, and damage to the amount of $25,000 was done to the property of the Weaver-Twelvetree Co., dealer in Pierce-Arrow, Premier and Flanders cars, which was located at 1216 Huron road. The losses of the Standard Auto Top & Repair Co. and the City Auto Tire Repair Co. were small.

Morgan Files Suit for Priming Device.

Bernard Morgan, "a subject of the King of Great Britain," as he describes himself in his bill of complaint, filed suit Saturday, 1st inst., in the United States District Court for the Southern District of New York against the Auto Supply Co., of 1789 Broadway, New York City, charging infringement of patent No. 982,009, granted January 17, 1911, and which covers a priming cock for internal combustion motors. Morgan, who operates a garage and machine shop in Newport, R. I., in which in a small way he has produced several specialties, found his way into print not long ago when he sent word to his British brethren that he could find employment in America for quite a number of them and suggested how they might dodge the contract labor law.

Establishes Right to Name "Gordon."

If any doubt existed as to the exclusive right of the Vehicle Apron & Hood Co., of Columbus, Ohio, to the name "Gordon" as applied to tire covers, tire trunks and other accessories of that class, it should be removed by the decision of the United States District Court for the Southern District of New York, which last week enjoined the National Auto Supply Co., of New York City, from falsely representing itself as a purveyor of "Gordon" goods and from substituting other goods for "Gordon" goods after soliciting order under the disputed trade name. The complaint stated that the defendant had listed "Gordon" goods in its catalogue and that when orders were sent in substitutes were sent, even though the invoices read "Gordon." The Columbus company stated that because of substitution its business in 1911 fell off $50,000, despite the fact that its advertising was more than tripled.

Legal Punctures in Patented Tube.

Ira F. Trautman, who about two years ago set up in business in Brooklyn, N. Y., at 129 Sixth avenue, and undertook to produce an inner tube of sponge-like character, under a patent he had secured, appears not to have prospered greatly, according to judgments filed against him this week in the New York county clerk's office; for crude rubber which he purchased from A. W. Brunn, a rubber broker, the latter filed judgment for $499.02 against Trautman and the Trautman Air Rubber Tube Co. Another judgment was for $267.65 and was taken by J. C. Tomlinson, Jr., a New York attorney.

Foundryman and Randerson Settle Dispute.

Differences which arose over a contract wherein William J. Cunningham, operator of a brass foundry in New York City, agreed to manufacture a quantity of bumpers for the Randerson Auto Parts Co., of New York City, and which differences led to a suit by Cunningham in the New York City Court, have been settled and the action has been discontinued. Cunningham sued for about $300 when the Randerson company repudiated his contract on the grounds that the work he did was not up to the specified standard.

Syracuse Dealer Arrested on Judgment.

Frank P. Anderson, an automobile dealer in Syracuse, N. Y., is working in a limited territory, not because of any clause in his agency contract, but because Miss Mary H. Walsh, who claimed she paid money for a car she did not get, secured a judgment for $1,546 and a body execution which brought about Anderson's arrest; incarceration would have been his lot had he not been able to secure a bondsman, but as it is he is forbidden to leave Onondaga county until the judgment is satisfied.

Sale of Michigan Magneto Nets $4,600.

The property of the Michigan Magneto Co. of Detroit, which failed three weeks ago with liabilities of $31,050, was sold by the receiver on Thursday last to Louis Duskoff for $4,600. Subsequently a creditors' dividend of 7 per cent. was declared.

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PERMANENT ACCESSORY SHOW A METROPOLITAN VENTURE

Ambitious Venture Scheduled To Be Inaugurated March 1 in Broadway Building—The Projectors and Their Plans.

Just as automobile manufacturers are taking the first steps toward the discontinuance of the national shows, other interests are about to inaugurate in New York City what is designed to be a permanent exhibition, not of automobiles but of automobile wares—that is, accessories of every nature.

These interests will operate under the style Auto Center, Inc., the necessary charter, which places the capital stock at $25,000, having been applied for. The chief officers of the borning corporation are not, however, in any way affiliated with the automobile industry. They are William A. Kelsey, of Meriden, Conn., who is president of both the Kelsey Printing Press Co. and the Morning Record Co., who will be president of the Auto Center, and John Stanley, cashier of the First National Bank in Whitestone, L. I., who will be treasurer.

The man chiefly responsible for the project, however, is John M. Gorham, a New York attorney, who at one time was connected with an automobile renting enterprise. He vigorously resents being styled a promoter, declaring that he is an organizer, and now that his work has been brought to a head he states that he does not know whether he will be connected with it, or, if so, in what capacity.

He is authority for the assertion that the permanent exhibition, or motor mart, or whatever it may be styled, will open for business on March 1st next in the Long Acre building on the northeast corner of Broadway and 42d street, New York City, the entire second floor of which, containing 10,200 square feet, has been acquired for the purpose, the owners of the building apparently being identified with the Auto Center, but to what extent and in what manner Gorham refuses to say. He did say, however, that not less than 45 accessory manufacturers have contracted to display their wares, and as they are given the privilege of sub-leasing a part of their spaces, from information at his command, he estimates that at least 110 different exhibits will be in place when the Center opens for business on March 1st. He will give no names at this time, but says they will be made public next week, when the charter is received from Albany.

According to the prospectus of the Auto Center, a standard booth or counter, six feet square, will cost $75 per month, payable in advance, under lease for from one to five years; or, if desired, any article will be displayed in a booth for $300 per year plus 6 per cent. of the amount of the gross sales, the Auto Center furnishing the salesman and providing the necessary fixtures, etc.

The Auto Center binds itself to expend at least $100 a week for advertising and to provide a changing electric device in a large window and to keep it illuminated until 11 P. M. six nights of each week. Window displays also will be made on an elaborate scale and will be changed regularly.

Portage-Stein Lawsuit Refiled.

The decision of the Court of Appeals of New York State last week that the New York City Court has jurisdiction only in litigation where amounts not greater than $2,000 are involved, has necessitated the withdrawal of several suits from that court and their filing in the Supreme Court for New York county; one which was so handled this week was an action instituted several months ago by the Portage Rubber Co., of Akron, Ohio, against the Stein Tire & Rubber Co., of New York City, on a note for $4,376.33, which amount is more than twice the City Court limit.

Packers and Customer Come to Terms.

The suit which was brought last week in the Supreme Court for New York county by the Colonial Mantel & Refrigerator Co., of New York City, against the Packers Motor Truck Co., of Wheeling, W. Va., proved of short duration, for it was discontinued Saturday, 1st inst. The Colonial company asked $3,043, which it claimed it paid for a Packers truck that was not up to the specifications in the contract of sale and as a preliminary move in the action secured an attachment.

Borrowed Money from the Coal Man.

Money which H. L. Herbert & Co., a metropolitan coal dealer, loaned to the Couple Gear Co., of New York, in 1910 was the cause of a verdict given this week in the New York City Court in favor of the former for $1,777.16; the money was secured by a note of the face value of $1,580, and one cause of dispute over payment was as to whether the endorser, who was John Hanson Kennard, president of the Couple Gear, had been properly notified.

Hay Hangs Out His Own Shingle.

Thomas J. Hay, one of the real veterans of the industry, who for many years was manager of the Ford branch in Chicago, has embarked in business on his own account at 1725 Michigan avenue, in that city. He will handle the Staver line in northern Illinois, eastern Iowa, southern Michigan and all of Indiana.

DAIMLER REVOKES RIGHTS OF ITS AMERICAN LICENSEE

Failure to Pay Royalties Immediate Cause of Action But Friction Preceded It—Mercedes Situation Somewhat Involved.

Strained relations between the Daimler Motoren Gesellschaft, of Untertuerkheim, Germany, and its American licensee, the Daimler Mfg. Co., of New York, which became plainly visible some two months ago, have led to an open rupture. As a result, the Daimler Mfg. Co.'s contract has been cancelled and its rights revoked. The Daimler Import Co., of New York, which held the right to import completed cars, also may find itself involved in the litigation.

The fact that friction existed between the German company and its American representatives became public property two months ago, when the former secured an injunction restraining the Daimler Mfg. Co. from interfering with Mercedes owners; the interference consisted of serving notice on the owners of all such cars which had been purchased abroad that they must "step up to the captain's office" and pay license fees to the holders of the Daimler rights in America.

The immediate cause of the cancellation of the Daimler Mfg. Co., contract, however, was its failure to pay $5,000 on the last day of 1912, that sum being the semi-annual payment required under the agreement which calls for a minimum of $10,000 a year in royalties. Several days after being notified that its American rights had been revoked, the American Daimler interests tendered a check for $5,000, but when the legal representatives of the parent company cabled to Germany concerning the acceptance of the money the answer that came back was not of the sort that pleased the Americans or that promoted good feeling between the one-time friends. The tardily tendered money was not accepted, but that the Daimler Mfg. Co. proposes to put up a fight of some sort is indicated by its announcement, the substance of which is that it believes it still "retains its rights" and will act accordingly.

The contract between the two parties was renewed in 1910 and was to be continued for a period of 10 years. The Daimler Mfg. Co. held the Mercedes rights in this country for very many years, but at no time did it cut a very large figure in business, and since the destruction of its plant by fire, about four years ago, it has ceased to operate as a manufacturing establishment.

The cancellation of the contract automatically cancels the sub-agreement entered

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into by the Daimler Mfg. Co. with the General Vehicle Co. of Long Island City, N. Y., which granted to the latter the right to build Mercedes trucks in this country, but as the relations between the General Vehicle Co. and the German Daimler interests are close and cordial, it is quite probable that the former will become possessed of an even broader license from Germany.

The Daimler Import Co., as stated, retains its license, but has been in the hands of receivers for several months, which implies lask of financial strength, which fact is not very pleasing to the Germans, and it is therefore certain that a change of some sort is contemplated. It is possible that the change may permit the Daimler Import Co. to retain its contract, which was executed in 1910 and covers a term of five years, but it is probable that if such an arrangement is effected new conditions will be imposed.

The Import company also appeared in the current records of the United States District Court for the Southern District of New York this week, when an old suit against it by Leonard H. Dyer, patentee of automobile and transmission devices, was discontinued; this move, however, was "without prejudice," which means that the action may be renewed at any time. The discontinuance is said to have been prompted by the fact that while Dyer held the patents when the suit was started four or five years ago, they are now held by the Enterprize Automobile Co., and if any new action is begun the latter will bring it.

To Make Prof. Bailey's Electric Systems.

For the purpose of manufacturing an electric lighting, starting and ignition system invented by B. F. Bailey, an instructor in electricity in the University of Michigan and the author of several electrical works, the Bailey Electric Co., of Grand Rapids, has been incorporated under the laws of Michigan with a nominal capital of $25,000. Its officers are: President, H. B. Woodcock; vice-president, A. R. Cosgrove; treasurer, R. G. Woodcock; secretary, H. D. Wilson; designer and consulting engineer, B. F. Bailey.

It will manufacture the three-in-one system in one or in separate units, the complete outfit, not including the battery, weighing but 55 pounds. The company also will produce the Bailey small lighting dynamo, which weighs only 15 pounds and which can be applied to any car.

The several productions will be marketed by Wilson & Cosgrove, who are located in the Goldberg building in Detroit.

The Republic Rubber Co. of Youngstown, O., has established a branch in St. Louis at 2018-20 Locust street. It is in charge of George M. Hoffman.

J. D. MAXWELL INCORPORATES SECOND MAXWELL COMPANY

Makes His Challenge to United States Motor Reorganizers Even More Direct—Meanwhile Pays Visit to Indiana.

J. D. Maxwell, who two weeks ago organized the J. D. Maxwell Motor Corporation under the laws of New York and thereby challenged the right of the reorganizers of the United States Motor Co. to use the name Maxwell Motor Co., is not yet ready to disclose his plans. It transpires, however, that in addition to the J. D. Maxwell Motor Corporation he also has organized, under the laws of New York, the Maxwell Motor Co., Inc., which is an even more direct challenge to the United States Motor reorganizers. One of Mr. Maxwell's enterprises will be a car manufacturing company; the other a selling company, but just who are the men associated with him has not been disclosed.

It is known, however, that the lawyer who is directing his legal steps is none other than Herbert L. Satterlee, who is J. Pierpont Morgan's son-in-law and who, oddly enough, was one of the attorneys, if not the chief one, who originally assisted in whipping the United States Motor Co. itself into corporate shape.

Maxwell himself still retains his home in Tarrytown, N. Y., where the original Maxwell-Briscoe factory, now abandoned, is located, but at present he is in Indiana, in either Indianapolis or Newcastle. It is in Newcastle that a branch Maxwell-Briscoe plant is located and of which, although included in their purchase, the United States Motor reorganizers have not been permitted to take possession, having been checked by a restraining order sued out by Indiana creditors.

Changes Among Prominent Tradesmen.

J. F. Lanier has been appointed manager of the Buffalo branch of the Diamond Rubber Co. He succeeds W. Connell Shank.

Frank G. Manthe has been promoted to the management of the Newark (N. J.) branch of the Goodyear Tire & Rubber Co. Previously he was chief clerk of the establishment.

Wm. H. Davis, former advertising manager of the Dayton Motor Car Co., has been added to the staff of the Locomobile Co. of America. He will have charge of its truck advertising.

George J. Bates has been appointed sales manager of the pneumatic tire department of the Firestone Tire & Rubber Co. of Akron, Ohio. For the five previous years, Bates was a department manager in the Diamond Rubber Co.

Henry C. Bailey, at one time superintendent of the Corbin Motor Vehicle Corporation, has been appointed manager of the Hartford Auto Parts Co. of Hartford, Conn. He succeeds David F. Kalish, who resigned to engage in a different line of manufacture.

George H. Connor, assistant sales manager of the Buick branch in Boston for the past five years, has resigned that post to become manager of the Brooklyn (N. Y.) Republic Motor Co., which means that hereafter he will have to do with Chevrolet and Little cars.

C. E. Harding, who for the past 11 years covered the northern part of Ohio and Pennsylvania in the interests of the Goodrich Tire & Rubber Co., has resigned his position and gone over to the Kelly-Springfield Tire Co. He will cover his old territory for the Kelly-Springfield people.

M. L. Railsbach has resigned the sales management of the Jackson-Church-Wilcox Co. of Saginaw, Mich., maker of the Jacox steering gear. He will join Merrill M. Wilcox, former general manager of the company, in a new corporation which the latter is organizing in Saginaw and which it is understood also will manufacture steering gears, among other things.

Castle Finds Another Lamp Account.

Fred E. Castle, former president of the Castle Lamp Co., of Battle Creek, Mich., has joined hands with Charles Munson, sales agent for the Edmunds & Jones Mfg. Co., of Detroit, and together they will constitute the firm Castle & Munson and will continue the E. & J. lamps as the chief account. Rands windshields and several other well-known accessories will be added to their lines.

Keck to Leave New York for Kenosha.

L. J. Keck, who almost since its inception has managed the Badger Brass Mfg. Co.'s Eastern factory in New York, is preparing to return to the main plant in Kenosha, Wis., from which he originally came. He had expected to make the change on February 1st. When he goes to Kenosha, Keck will assume charge of the office affairs of the Badger company.

Firestone "Opens Up" in Salt Lake.

The Firestone Tire & Rubber Co. has taken over the Utah Tire & Rubber Co. in Salt Lake City, which previously handled Firestone tires, and will conduct the business as a factory branch. It will be in charge of M. L. Tarbush, who previously was connected with the Firestone factory in Akron.

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The Week's Incorporations

St. Louis, Mo.—Collier-Reitz Motor Car Co., under Missouri laws; authorized capital, $5,000; to deal in motor cars.

St. Louis, Mo.—Patterson-Abram Automobile Co., under Missouri laws; authorized capital, $2,000; to deal in motor cars.

Salt Lake City, Utah—Alkire-Smith Automobile Co., under Utah laws; authorized capital, $25,000; to deal in motor cars.

Fitchburg, Mass.—Welsh & Suthergreen Co., under Massachusetts laws; authorized capital, $30,000; to deal in motor vehicles.

Somerville, Mass.—Atlantic Motor & Supply Co., under Massachusetts laws; authorized capital, $25,000; to deal in motor cars.

Richfield Springs, N. Y.—Ostrander & Owen Co., under New York laws; authorized capital, $8,000; to deal in motor vehicles.

Rosslyn, Va.—District Automobile Service Co., under Virginia laws; authorized capital, $50,000; to operate a motor delivery.

Connersville, Ind.—Central Car Co., under Indiana laws; authorized capital, $100,000; to manufacture motor cars. Corporators—John W. Burke and others.

El Paso, Tex.—Lowell Auto Truck Sales Co., under Texas laws; authorized capital, $10,000; to deal in motor trucks. Corporators—J. J. Longwell and others.

Los Angeles, Cal.—Renton Motor Car Co., under California laws; authorized capital, $100,000; to deal in motor cars. Corporators—P. A. Renton and others.

Camden, N. J.—United States Tire Filler Co., under New Jersey laws; authorized capital, $25,000; to manufacture tire filler. Corporators—R. B. Patton and others.

Philadelphia, Pa.—Tension Tire Co., under Delaware laws; authorized capital, $100,000; to manufacture motor car tires. Corporators—Robert G. Grigg and others.

Toledo, O.—Shriver Rubber Co., under Ohio laws; authorized capital, $50,000; to manufacture rubber goods. Corporators—L. H. Shriver, A. G. Florian, E. A. Florian.

Cleveland, Ohio—C. H. Tyler Motor Co., under Ohio laws; authorized capital, $10,000; to deal in motor cars. Corporators—C. H. Tyler, John Monson, Charles W. Rush.

San Francisco, Cal.—Circle City Garage Co., under California laws; authorized capital, $10,000; to operate a garage. Corporators—R. E. McCrea, W. J. Fink and others.

Seattle, Wash.—Pacific General Motors Co., under Washington laws; authorized capital, $10,000; to deal in motor cars. Corporators—O. L. Taylor, J. C. Burlock and others.

Toledo, Ohio—General Motor Truck Co., under Ohio laws; authorized capital, $50,000; to operate a motor transfer. Corporators—C. B. Grandy, C. O. Morton, F. M. Dotson.

Alliance, Ohio—Alliance Motor Car Co., under Ohio laws; authorized capital, $50,000; to deal in motor cars. Corporators—C. C. Mummert, Morris W. Geiger, G. K. Pritchard.

New Haven, Conn.—National Garage Co., under Connecticut laws; authorized capital, $50,000; to operate a garage. Corporators—Charles W. Lowe, Gennara De Lucia, C. W. White.

Camden, N. J.—Eclipse Wheel Co., under New Jersey laws; authorized capital, $300,000; to manufacture wheels. Corporators—F. R. Hansell, John A. MacPeak, George H. B. Martin.

Baltimore, Md.—Hall-Seeley Motor Corp., under Delaware laws; authorized capital, $1,000,000; to manufacture motor cars. Corporators—Milan W. Hall, C. Ford Seeley, Leo S. Meyer.

Buffalo, N. Y.—Rub-On Mfg. Co., under New York laws; authorized capital, $5,000; to manufacture motor car devices. Corporators—Otis Bower, W. Alek Faxon, Wm. H. Faxon.

Cleveland, O.—Krankless Starter & Mfg. Co., under Ohio laws; authorized capital, $25,000; to manufacture motor car parts. Corporators—A. G. Freeman, F. A. Sweet, Fred E. Gerber.

Boston, Mass.—Universal Truck Co., of New England, under Massachusetts laws; authorized capital, $25,000; to deal in motor trucks. Corporators—M. Meyers, M. E. Crable, F. L. Hewitt.

East Orange, N. J.—F. C. D. Inner Tube Protector Co., under New Jersey laws; authorized capital, $150,000; to manufacture tire protectors. Corporators—G. S. Field, J. H. Christian, T. Dick.

Boston, Mass.—Goodnow Mfg. Co., under Massachusetts laws; authorized capital, $25,000; to deal in motor car supplies. Corporators—Russell J. Goodnow, Walter A. Ladd, Archibold MacGregor.

Hartford, Conn.—Electric Auto Station, Inc., under Connecticut laws; authorized capital, $35,000; to operate a garage. Corporators—Fred W. Woolley, Charles G. Frisbie, Edward T. Canfield.

Peru, Ind.—Peru Castings & Machinery Co., under Indiana laws; authorized capital, $25,000; to manufacture motor parts. Corporators—Claude E. McCampbell, Robert M. Carter, Isaac H. Barbee.

Anderson, Ind.—Clark-Moody Automobile Co., under Indiana laws; authorized capital, $10,000; to deal in motor cars. Corporators—John D. Clark, Louis W. Moody, Maud B. Clark, Anna M. Moody.

New York, N. Y.—United Garage Co., Inc., under New York laws; authorized capital, $14,000; to operate a garage. Corporators—Knud Mynter, Edwin B. Smith, Samuel Ecker, 169 East 19th street.

Detroit, Mich.—City Auto Rental Co., under Michigan laws; authorized capital, $2,000; to conduct an automobile livery. Corporators—Minnie Tucker, Edgar Guard, William Guard, Henry W. Tucker.

Indianapolis, Ind.—Simplex Vehicle & Gear Co., under Indiana laws; authorized capital, $15,000; to manufacture motor car parts. Corporators—Theodore Sanstrom, Maurice M. Kiefer, Samuel S. Helms.

Yonkers, N. Y.—Ralph W. Hibbard, Inc., under New York laws; authorized capital, $5,000; to operate a garage. Corporators—Ralph B. Hibbard, Louise P. Hibbard, Elliott W. Pitkin, 95 Locust Hill avenue, Yonkers.

New York, N. Y.—Brown Car Corp., under New York laws; authorized capital, $30,000; to deal in motor cars. Corporators—W. P. Farge, 56 Park avenue; H. W. Torney, 65 Park avenue; E. E. Beyer, 454 Riverside Drive.

New York, N. Y.—Safety Auto Control Corp., under New York laws; authorized capital, $7,000; to manufacture motor car devices. Corporators—Howard K. Wood, H. O. Coughlan, Joseph F. Curtain, all of 34 Nassau street.

New York, N. Y.—United Garage Co., under New York laws; authorized capital,

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LOZIER EX-LIEUTENANTS LAUNCH THE CHANDLER SIX

Form $425,000 Company Under Ohio Laws and Promptly Uncover Their Car—Proves an Appealing Model at $1,785.

Having officially severed their relations with the Lozier Motor Co., of Detroit, with which they were so long connected, F. C. Chandler, C. A. Emise, Samuel Regar and the others who have joined with them have lost no time in putting into practice the well-laid plans which it was known they quietly had worked out.

They have organized the Chandler Motor Car Co., and incorporated it under the laws of Ohio with an authorized capital of $425,000. Temporarily the new company will be located at 925 Woodward avenue, in Detroit, but it is probable that it permanently will establish itself in Cleveland. It is certain, at any rate, that it will not become a Detroit industry.

It will manufacture a light "six" listing at $1,785, fully equipped, the first of which already is in being, but deliveries will not be made until July 1st next.

F. C. Chandler, who previously was vice-president and general manager of the Lozier company, is president of the company which bears his name; C. A. Emise, the former Lozier sales manager, is vice-president and sales manager of the Chandler corporation; Samuel Regar will be its treasurer, a position which he filled in the Lozier institution; W. S. M. Mead, former manager of the Lozier branch in New York, is secretary. J. V. Whitbeck, at one time Lozier's assistant chief engineer, who also has had experience in the Olds, Thomas and Franklin establishments, is chief engineer of the new enterprise, and J. R. Hall, who was superintendent of the Lozier service department, is the Chandler company's superintendent and manager of production. All of the men were identified with the Lozier interests for periods ranging from eight to fourteen years, which implies that they not only know the automobile business intimately but know each other well.

The Chandler light "six," as the new car will be styled, is Whitbeck's creation and all who have been permitted to see it have been impressed by its simplicity and clean design. It does not lack individuality, although in general appearance it closely resembles the Lozier light "six." It has the same stream-line body, the same square tube type of radiator, and also employs ft side drive and center control. It has a heelbase of 120 inches, 34 x 4 wheels fitted ith demountable rims, a three-speed selective transmission of special design and of unit construction, multiple disk clutch, 14-inch double expanding and fully enclosed brakes, floating rear axle, three-quarter elliptic rear springs and pressure fed gasolene supply contained in a tank suspended from the rear frame.

The Chandler motor is one of the car's most impressive features. It is of the L-head, pair-cast type and of remarkably clean design, no oil pipes, for instance, being visible. Its cylinder dimensions are 3⅜ x 5 inches, and at 1,000 revolutions it develops 35 horsepower. The cam shaft, pump and magneto are driven by enclosed silent chains instead of gears. The valves also are enclosed.

The motor weighs approximately 637 pounds and the car, all on, scales slightly less than 3,000 pounds. It employs Bosch high tension ignition and a Westinghouse electric starting and lighting system. The equipment includes mohair top and top covers, quick detachable curtains, built-in windshield, speedometer, clock, electric horn, rear tire carrier and jack, pump and tool equipment.

In explaining the remarkably low price of a car of such caliber, Sales Manager Emise states that it was made possible solely because there was absolutely nothing to charge to the account of experimental work; the men knew what they wanted and went straight to it without incurring heavy preliminary expense.

Incidentally, it is not the purpose of the Chandler company to make large physical investment in machinery and buildings. The engine and other parts will be built by specialists in the several fields, but according to specifications and under the supervision of Chandler experts. For the Chandler "six" will be a specially designed and specially built car and not merely an assembled machine.

Briscoe Car to be Built in Detroit.

To facilitate the development of his under $1,000 touring car for the American market, which development is being performed in France, Benjamin Briscoe, former president of the United States Motor Co., has registered a company under the title Briscoe Freres, which indicates that his brother Frank, who preceded him abroad, is also interested in the enterprise

The factory in which the work is being performed, and in which American and French engineers are collaborating, is located in Billancourt, where the Renault factory is situated. It is extremely probable that when the Briscoe model is brought to this country it will be manufactured in Detroit, in which city Benjamin Briscoe first made his mark and to which it is his intention to return.

FIREBALL REKINDLES SPARK IN PREST-O-LITE'S PATENT

Highest Court Permits St. Louis Company to Make Final Test of "Dead" Invention—Will Settle Conflicting Decisions.

Instead of being officially "dead," as was supposed when the United States Circuit Court of Appeals in Chicago so ruled a month ago, the Claude and Hess patent, No. 664,383, under which the Prest-O-Lite Co. operated, is technically possessed of a faint spark of life in that it is to be the subject of further litigation, this time in the United States Supreme Court. The spark was found by the Fireball Gas Tank & Illuminating Co., of St. Louis, which this week was granted permission to appeal from an earlier circuit court decision which held the Claude and Hess patent good. While the outcome is a mere matter of speculation, the Prest-O-Lite Co. is sounding no trumpets of triumph at the prospective appeal, for it had acquiesced to the decision overturning the patent and was preparing to meet competition on other grounds.

The granting of a writ of certiorari is regarded as an indication of a belief on the part of the Supreme Court that the question as to whether the patent expired two years ago at the same time the British patent expired as an important one, and the permission to appeal also is doubtless given in order that one or the other of the two conflicting decisions of the circuit court may be made final. As the matter now stands, a Federal circuit court in Missouri is on record as declaring the patent in force until 1917, while the Chicago circuit court says it died a natural death two years ago, and the latter decision had been generally accepted.

While the Chicago decision was a victory for the Searchlight Gas Co., that strong competitor of the Prest-O-Lite lost its formidableness a few days after its victory, when it went into the hands of a receiver; a complication, also, is that while the Searchlight is permitted to operate under the patent, if able, the Fireball is still under an injunction. The turn which affairs have taken in the highest trtibunal may continue to hold together the Prest-O-Lite and Commercial Acetylene companies, the latter having been the possessor of the patent and the former a licensee, and, with the patent operative, both were complainants in litigation.

The Little Motor Car Co. of Flint, Mich., has established a branch in London. It is located at 89 Great Portland street, West.

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In the RETAIL WORLD

E. W. Harrold has entered the garage trade in Lathrobe, Pa.

Avery & Hurley Co. is the style of a new garage business in St. Cloud, Minn.

Scott & Berkler of Emmetsburg, Ia., have had plans prepared for a new garage.

The Barker Auto Co. has removed from the town of Hartford to Plymouth, Conn.

A garage is being erected in Austin, Minn., for the occupancy of the Nolan Auto Co.

The Toledo (O.) Tire & Repair Co. has changed its name to Toledo Tire & Supply Co.

John Thompson, of Albia, Ia., plans to establish a garage in Moulton, in the same State.

William Schwartz has sold his interest in the Brenham (Tex.) Motor Car Co. to William Spitzler.

William Kingsley is about to open up in Ferbault, Minn., under the style Central Auto Garage.

I. J. Heilbron, an accessory dealer in Pensacola, Fla., is about to open a garage on Chase street.

Forstner Bros., of Madelia, Minn., have purchased a building which they will remodel for garage purposes.

Alvah Beenblossom of Washington, Ia., has purchased an interest in a garage in Grinnell, in the same State.

The Haynes Automobile Co. has established a branch in Sacramento, Cal. It is in charge of George E. Valerius.

O. M. Driscoll has opened salesrooms and a service station in Trenton, N. J., at 24 East Front street; he will stock Hupmobiles.

E. D. Powell has disposed of his interest in a drug store in Audubon, Ia., and has purchased an interest in a garage in Lawrence, Kan.

The Iowa Taxicab Co., of Davenport, Ia., has been sold by Dennis McEnery to Edward Slavin; it is located at 113-15 Commercial alley.

Mark Wentworth and Charles W. Brenn are about to open a garage in Newport, Me. They have purchased Main street property for this purpose.

The Florida Motor Co., of Jacksonville, is about to establish an agency in Pensacola, Fla. The company is State agent for Stearns-Knight cars.

J. M. Lawrence has entered the trade in San Jose, Cal. He has secured salesrooms on South Market street and will handle trucks and pleasure cars.

F. B. Callender, of Wichita, Kan., is about to establish an agency in Hutchinson, in the same State, at 116 South Main street; he will handle the Cadillac.

The Bonde Motor Car Co., of Fargo, N. D., is about to build a garage and salesrooms, 25 x 125 feet; the company handles Warren and Hupmobile cars.

Charles Kloppmeyer has entered the trade in Washington, D. C., and has erected a salesroom at 14th and W streets, Northwest; he has the Hupmobile agency.

M. R. Kauffman, of Long Level, Pa., and Bird Kauffman, of York, in the same State, are preparing to establish a garage business in Wrightsville, another Pennsylvania town.

Andrew Carpenter has entered the trade in Adrian, Mich. He has purchased the Auto Inn, formerly operated by Malcolm Kinney and Edward Shields, and will conduct a garage.

The J. E. Marsh Elevator & Machine Corporation, of Baltimore, Md., is about to engage in automobile repairing; the new branch of its business will be conducted in recently acquired premises at 216 North Holliday street.

Carl Zeust, a former electric car salesman, has established a Rauch & Lang agency in St. Louis, Mo., at Delmar and Clarendon streets; the agency was maintained for a number of years by the Union Electric Co., a power company.

The Horn Automobile Supply Co., of 2121 Farnam street, Omaha, Neb., plans to erect a two-story building near its present location; the company's capital stock was recently increased to $35,000 and the business is to be enlarged.

The Himes Motor Sales Co. has been formed in Toledo, O., with M. R. Himes, a former garageman, as its head; salesrooms have been secured at 919 Jefferson avenue and Reo and Moon cars will be sold in the territory about Toledo.

The Fritchie Electric Auto Sales Co. has opened up in Los Angeles at 1432 West Pico street; Robert H. Reid and Clyde H. Osborne, the latter the secretary of the Fritchie Automobile & Battery Co., of Denver, Col., are in charge.

E. G. Dann, former manager of the Dann-Dodge Co., of Chicago, has withdrawn from that company and has formed the Cutting Motor Co., of which he is president; A. W. Mackey is secretary and treasurer. The new company will distribute Cutting cars in an enlarged territory.

The Arenz-Weihaupt Auto Co. has entered the trade in LaCrosse, Wis. The officers are: J. G. Weihaupt, president and general manager; vice-president, George W. Weihaupt; secretary and treasurer, J. S. Arenz; sales manager, S. Bovee.

Maumee Motor Car Co. is the style under which a new business is about to be opened up in Toledo, O. Edwin M. Stone is the organizer of the company, which will handle Empire and King cars in Northwestern Ohio, Southern Michigan and Eastern Indiana.

F. L. Hoaglin, who has operated the Waupaca (Wis.) Garage for five years, has sold the business to Van A. B. Nelson; the deal carries with it the Ford, Overland and Cadillac agencies. Hoaglin and G. C. Ritchie will manufacture a patented funnel known as the No-Spill.

The W. F. Allen Co., of Milwaukee, Wis., which is temporarily located at 2807 Wells street, is about to remove to a new building at 2713-15 Grand avenue; the new structure is a garage and salesrooms and has a capacity for 100 cars. The company handles the Marathon and McFarlan lines.

John T. Stewart, 2nd, and George E. Toozer, having purchased the business of H. E. Frederickson, of Omaha, Neb., have incorporated at $25,000; the style is Stewart-Toozer Motor Co. Stewart's former Mitchell agency is retained along with the Chalmers agency which was part of the purchase from Frederickson.

The De Luxe Automobile Co., which is a reincorporation of the Warren Automobile Co. in St. Louis, Mo., has located at 3134-36 Locust street; the new company's officers are: President, P. H. Brockman; general manager, Dan W. Iseminger; city salesman, W. Harrison Comford. Warren cars will be handled as heretofore.

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Byers, Lay & Byers, who formerly conducted the Elm Street Garage in Westfield, Mass., and whose place of business was destroyed by fire several weeks ago, have dissolved partnership and will withdraw from the trade; the firm comprised Edwin R. Lay, Arthur F. Byers and George H. Byers, the latter of whom has been empowered to wind up the business.

The retail sales business of the Palmer & Singer Mfg. Co. in New York City and Westchester County, heretofore handled as a factory branch at 1620 Broadway, was taken over February 1 by the Drouet & Page Co. which has located at 1890 Broadway. The concern comprises Henry Drouet, formerly of Chicago, and Frederick Page, of New York City. The Palmer & Singer company will utilize its present Broadway location temporarily for the sale of used cars and the transaction of wholesale business, but eventually will close up its affairs at this address.

Recent Losses by Fire.

Marysville, Ky.—Marysville Garage damaged. Loss, $2,000.

Joliet, Ill.—Charles Stener, garage destroyed. Loss, $3,000.

Ottumwa, Ia.—R. M. Mick, garage destroyed. Loss not given.

Tulsa, Okla.—Tulsa Motor Car Co., garage damaged. Loss, $5,000.

LeRoy, N. Y.—Archie P. McCowan, garage damaged. Loss, $4,500.

Chisholm, Minn.—W. A. Master, garage and contents destroyed. Loss not given.

Sioux City, Ia.—T. G. Northwall, dealer, building and contents destroyed. Loss, $70,000.

Detroit, Mich.—Detroit Auto Dash Co., 517 Beaubien street, plant damaged. Loss, $10,000.

Minneapolis, Minn.—S. Murphy Automobile Co., 3d street, building and contents damaged. Loss, $10,000.

New York, N. Y.—Victor Automobile Garage & Storage Co., 118-22 West 56th street, building destroyed and 100 cars destroyed or damaged. Loss, $100,000.

Chicago, Ill.—Motor Car Supply Co., 1451-55 Michigan avenue, building and stock damaged. Loss, $59,600. Hester Mfg. Co., same address; loss, $34,000. Gardner Engine Co. also sustained damage.

Cleveland, Ohio—Judd Automobile Co., 1206 Huron road, building and contents destroyed. Loss, building, $30,000, 275 cars privately owned, $300,000; Buick Sales Co., loss $30,000; Standard Auto Top & Repair Co., loss not given; Weaver-Twelvetree Co., 1216 Huron road, loss $2,000; City Auto Tire Repair Co., 1200 Huron road, loss $1,000. Total, $363,000.

BUICK DECEIVED BY USED CAR DEALER AND EXPORTER

So Says Court in Helping Unravel Tangle Over Chassis Which Fell Into Used Car Dealer's Hands —Injunction Issued.

Difficulties over a contract which sprung up in the Supreme Court for New York county last month, when the General Motor Export Co. sought to restrain the Rodney K. Haines Co., a used car dealer in New York City, from selling a number of damaged Buick chassis which it had purchased from the exporting house, were placed in a new light last week, when Justice Greenbaum declared that the Buick Motor Co., the manufacturer of the chassis, had been deceived and forbid the Haines company, as a party to the deception, from advertising the sale of the chassis and from offering them as new.

The trouble grew out of the freight car shortage of the summer of 1912, when 14 chassis, shipped from Flint to New York for export, were damaged in transit because it was necessary to ship them on flat cars and late in 1912, to dispose of them, a deal was made whereby, it is stated, Walter J. Connell, a garage and taxicab operator at Flushing, L. I., agreed to take the chassis from the export company, to use them for taxicab work and not to sell them for speculation. Ostensibly, however, to have them fitted with bodies they were turned over to the Haines company, and shortly thereafter the Buick company began to censure its exporting agent for having put the chassis into the hands of a used car dealer, who, it stated, was marketing them to the damage of the Buick company.

Several letters to the export company were necessary before it got around to bring an injunction suit against Haines, and also against Connell, but in disposing of the case the judge classified Connell as a "dummy" in the transaction and dismissed the suit, so far as it was against him; but the court declared the deal a deception on the Flint company and therefore held that the latter was justly entitled to relief. The justice in his opinion said:

"It is clear that both the plaintiff and the defendant Haines company deliberately agreed that the defendant Connell was to be a mere medium or dummy with whom a formal contract for the sale of the 14 Buick chassis in suit was to be made containing the restrictions that they 'are to be put into actual service by himself, and not to be advertised or made the subject of speculation,' and that the Haines company was the real purchaser. This was ostensibly done to enable the plaintiff, as selling agent of the Buick Motor Co., to lead its principal to believe that these chassis were not sold for the purpose of resale. The effect of the transaction was a deception on the Buick Motor Co., in which the defendant participated, and for which he may not now be heard to claim that the actual contract was the one made with Connell and not with it. The plaintiff was the selling agent of the Buick Motor Co., and within the doctrine of Wetmore v. Porter (92 N. Y., 76) the plaintiff may assert the rights of its principal and seek such injunctive relief in its behalf as the facts warrant."

Willys Takes Over Hexter's Interests.

John N. Willys, who already owned a substantial interest in the Hexter Motor Truck Co., which handled Gramm trucks in New York City, has acquired the remaining interest of P. K. Hexter, who has retired from the company. Willys at once assumed the presidency, the other officers being George W. Bennett, vice-president; H. K. Sheridan, treasurer, and Royal Scott, secretary and manager, all of whom are members of the Willys headquarters staff. Hexter, however, will not retire from the truck business, as it is his intention to organize a company for the manufacture of commercial vehicles which probably will bear his own name. The first one will be a 1,500 pound wagon, but he intimates that he has a new type of truck in hand.

Minor Business Troubles.

In the bankruptcy court, in Boston, Mass., Henry T. Beal, Lloyd Makepeace and Robert Walcott have been named as trustees of George G. Reed, a supply dealer; a composition may be offered the creditors.

William G. and Philip S. Palmer, copartners in an automobile business in Hart, Mich., have filed a petition in bankruptcy; preferred claims are given as $946.77 and non-preferred claims as $1,458.27. The assets are about $1,500.

The Uhler Motor Co., of 830 South 5th street, St. Joseph, Mo., has filed a voluntary petition in bankruptcy; the unsecured claims amount to $31,130.68 and the assets to $5,805.80. Eugene Rosenbleet is president and Lewis Siegel secretary.

Judgment Follows Change in Firm.

When the withdrawal of one of the members of the garage firm comprising William R. Bennett and Herbert E. Pearsall, of Rockville Center, N. Y., caused delay in the payment of a tire bill to the United States Tire Co., the latter proceeded to court and obtained judgment, which was filed this week in the New York county clerk's office; it amounts to $201.33.

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DISCONTINUING THE NATIONAL SHOWS.

However great may be outside surprise at the suggestion that the national automobile shows be discontinued, the surprise will not be shared by very many of those who actually have to do with the annual exhibitions. For several years most of the car manufacturers and the producers of parts have viewed the shows in the light of necessary evils. It required only that someone should take the initiative, as has been done by Mr. Albert L. Pope, to turn the under-current of discontent or dissatisfaction into a well defined channel, having for its end the abandonment of the annual displays in New York and Chicago.

Very many of the car manufacturers regularly have come to the shows with nothing to sell, their outputs having been contracted for by dealers far in advance, while the average parts manufacturer has presented himself each year largely because he thought his presence desirable, if not necessary, or because his chief competitor was likely to be among the "also present." In other words, if the shows served him no good purpose, they did him no harm. But the general show-going public interests him not at all, and he has but few transactions even with dealers. To what extent the exhibitions serve the purposes of the accessory manufacturers is largely problematical. There never was a show which was not followed by conflicting reports concerning the volume of business which accrued.

Regardless of such reports, however, and not taking into account the heavy expense which falls on the exhibitors, undoubtedly the point which will weigh most with manufacturers is the almost complete disorganization of their sales operations: that is probably the worst and most widespread effect of the national shows. How complete is the disorganization only those immediately concerned are fully aware, but that it is serious there is no room for doubt. During a period of two months, selling operations are practically at a standstill and the even tenor of the trade is thrown sadly out of joint.

Of late years, there are those who have been at pains to point out that the most beneficial effect of the shows is a stimulation, or suggested stimulation of business, which directly profits the dealer, and that by virtue of the fact the shows are well worth while for the dealer's sake. But whether the stimulation is as potent as alleged is a pretty question. In fact, whether it is wise to resort to artificial stimulation is an even prettier question.

It is not the first time that the discontinuance of the national shows has been broached, and whether the movement undertaken by Mr. Pope will attain that end none can say. The hearty response which has been accorded his suggestion points that way, but many things can occur in the course of a twelvemonth to divert what appears even a strong and well defined current.

Undoubtedly the most serious obstacle to the discontinuance of the shows is the likelihood that promoters without trade affiliations, and without the interest of the trade at heart, will undertake to fill the breach or breaches. If, as Mr. Pope intimates, he is possessed of a means of overcoming that obstacle, the abandonment of the shows will be rendered simple and effective.

If stimulation for the dealer's benefit is believed to be necessary, or is found to be necessary, it is logical that local shows should best and most directly serve that purpose, exactly as they already are serving it in so many cities.

SOLVING THE USED CAR PROBLEM.

The two "solutions" which are published elsewhere in this issue are the last of those to be received in season to be eligible to Motor World's Used Car Contest which was inaugurated in October last. All of the contributions now will be submitted to the three judges who will decide the awards of the four cash prizes which were offered. Their work necessarily will occupy several weeks and their decisions cannot fail to have an important bearing on what, by all odds, is the most serious problem confronting the automobile dealers of this country: and what affects the dealer, affects the manufacturer.

That the inauguration of the contest and the exchange of ideas which has resulted has served to quicken the trade's appreciation of the subject is undoubted. The many opinions and suggestions brought to light proved the contest well worth while.

To say nothing of magnificent cash dividends previously disbursed, the Standard Oil Co. last week declared a stock dividend of $40 per share, which brings the total "melon cuttings" of thirteen months to $59,000,000. Is it any wonder that the "law of supply and demand"—for money—required the 90 per cent. advance in the price of gasolene?

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COURT TO DEFENSE OF MAN WHO CLAIMED HE WAS DUPED

David Harum Truck Sale Undone for Expressman Who Alleges Vehicle Was Falsely Represented—Judge Censures Methods.

Those who have considered themselves duped in horse trades of a David Harum character often have sought relief through the courts, and that there is, in this respect, some similarity between the automobile and the horse worlds seems to be borne out by an action which was this week won in the Supreme Court for New York county by Irving Rafsky, a New York City expressman, who claimed he was deceived when he purchased a truck from Frederick A. Smith, Inc., of 230 West 58th street, the deal being furthered by the Motor Finance Co., the business of which is financing automobile sales; the Smith and the Finance companies were named as defendants by Rafsky in his suit for rescission of the contract and his claim that the truck was not as represented called forth comment from the court to the effect that "the representations made by Smith as to the car were undoubtedly false and untrue, and that the Motor Finance Co. had knowledge that such representations were made and were false there can be no question."

According to the various papers on file, Rafsky went to the Finance company in January, 1912, and made inquiries concerning the financing of his purchase of a truck from the United States Motor Co. for $2,000. He received no assistance, and there likewise fell through a deal whereby he was to purchase two Autocars from the Finance company. However, on February 3, 1912, Rafsky arranged to buy what he claims was represented as a 1910 one-ton Autocar from the Smith company for $1,100, of which he paid $400 cash; the remainder of the deal was handled through the Motor Finance Co., which took a mortgage on the truck and accepted from Rafsky seven notes of $100 each. About two months later trouble arose. Rafsky claimed the truck was defective in construction, was not a 1910 model, would not carry one ton, and was not suited to his purposes. He demanded his money back and asked that the contract be rescinded and, when he could not get satisfaction, he sued. Meantime the truck had been taken by the Motor Finance Co. on its chattel mortgage. Rafsky's relief in the form of the rescission of the contract was granted by Judge Newburger, who, in addition to ruling that both defendants possessed guilty knowledge or intent, said: "The mere fact that the Motor company claims to have paid a valuable consideration for the notes is not sufficient. It must not only show it has acted in good faith, but that it had no knowledge of the fraud from the inception of the transaction."

Another defeat for the Motor Finance Co. was recorded this week when J. Todd was awarded costs of $102.33 and the custody of an automobile which he bought from the Motor Car Exchange and which, when the proprietor of the Exchange left town and left his affairs somewhat tangled, the Finance company claimed and siezed.

Budd to Build Steel Bodies in Detroit.

It is the intention of the Edward G. Budd Mfg. Co., of Philadelphia, Pa., which, as stated in *Motor World* last week, bought the factory building of the bankrupt Grabowsky Power Wagon Co. in Detroit, immediately to enlarge the structure and produce the Budd steel bodies in the Michigan city on a large scale, land for the enlargement also having been acquired. The former Grabowsky factory itself is a modern reinforced four-story concrete building, containing 72,000 square feet of floor space, and includes a modern power plant. The Budd company, which is capitalized at $500,000, will continue to operate its plant in Philadelphia to supply the automobile trade in the East.

Mabo to Enamel by New Process.

John R. Mack, general manager of the Kosmak Electrical Co., maker of the Cubit $3 electric horn, and J. L. Bowen, who has had ripe experience in the enameling business, have formed the Mabo Enameling Works and opened up at 251 Ocean avenue, Jersey City, N. J., where they will do general enameling work for the automobile trade. Bowen is the inventor of an air-drying process which is reputed to be far out of the usual. Mack, who retains his identity with the Kosmak Electrical Co., was induced to join the new enterprise because of the almost remarkable scarcity of such enameling plants in the metropolitan district.

Delayed Truck Delivery Basis of Suit.

Delay on the part of the Atterbury Motor Car Co. in delivering a truck to S. Zimmerman, a Rockaway (L. I.) truckman, in 1909, was the basis of a claim for damages which the latter carried into the Supreme Court for Queens county and which this week resulted in a judgment for him amounting to $1,106.63; he claimed the car was not delivered until three months after the date it had been promised and he thereupon sued for his deposit of $500 and other damages. The judgment was taken by default, which may be reopened if the Atterbury elects to take such action.



February 1-8, Chicago, Ill.—National Association of Automobile Manufacturers' 12th annual show in the Coliseum and 1st Regiment Armory. Pleasure cars only.

February 3-8, Washington, D. C.—Washington Automobile Show Co.'s exhibit in Convention Hall.

February 8-15, St. John, N. B.—First annual show of the New Brunswick Automobile Association in the Drill Hall.

February 8-15, Youngstown, Ohio—Annual show of the Youngstown Automobile Show Co. in the Auditorium and Annex.

February 8-15, Hartford, Conn.—Sixth annual show of the Hartford Automobile Dealers' Association in the State Armory.

February 10-15, Minneapolis, Minn.—Minneapoils Automobile Show Co.'s show in the National Guard Armory.

February 10-15, Chicago, Ill.—National Association of Automobile Manufacturers' 12th annual show in the Coliseum and 1st Regiment Armory. Commercial vehicles only.

February 12-15, Geneva, N. Y.—Annual show in the State Armory, under the auspices of the Ottawa Valley Motor Car Association.

February 15-22, Albany, N. Y.—Annual show of the Albany Automobile Dealers' Association in the State Armory.

February 15-22, Newark, N. J.—New Jersey Exhibition Co.'s Sixth annual exhibit in the First Regiment Armory.

February 16-23, Richmond, Va.—Richmond Automobile Dealers' Shows Co.'s exhibit in the Horse Show building.

February 17-27, Kansas City, Mo.—Kansas City Automobile Dealers' Association's show in Convention Hall. First week pleasure cars; second week commercial vehicles.

February 17-22, Jackson, Mich.—Jackson Automobile Dealers' Association's annual show.

February 18-22, Baltimore, Md.—Baltimore Automobile Dealers' Association's annual show in the Fifth Regiment Armory.

February 19-22, Kalamazoo, Mich.—Kalamazoo Automobile Dealers' Association's annual show.

February 19-22, Davenport, Ia.—Annual show of the Tri-City Automobile Dealers' Association in the Coliseum.

February 22-March 1, Brooklyn, N. Y.—Brooklyn Motor Dealers' Association's annual show in the 23rd Regiment Armory.

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LONG LOOKED FOR GAS PLOW EVOLVED BY AN INDIANAN

Company Organized to Manufacture Funk's Ingenious Invention—Operable by One Man and Adaptable to Many Uses.

During recent years persons who profess to be possessed of the faculty of seeing around corners, metaphorically speaking, and far into the future, have been prophesying that the next really big million-maker will be the one-man gasolene plow or other satisfactory farm tractor of small size—just big enough to do the work of a single horse in ploughing and similar work and operatable by one man—and selling at a price within the means of the average farmer.

The big gasolene tractor is the natural and logical successor of the steam traction engine—and, of course, a great improvement on it—and, perhaps because there is ample precedent, it has readily found its place on the farm. The little tractor, however, has to start at the very beginning, without any ancestors, and possibly this is one of the reasons why it has been so long in coming, notwithstanding the virgin soil—both literal and figurative—that awaits it. All of which is by way of preface to the statement that a small tractor of the kind in question is about to be offered to the farmer—a machine that will do Dobbin's work at the plough and cultivator and will furnish the power for sawing wood, driving farm machinery, churning, and so on, though it will not oust the horse from his place between the shafts of the wagon.

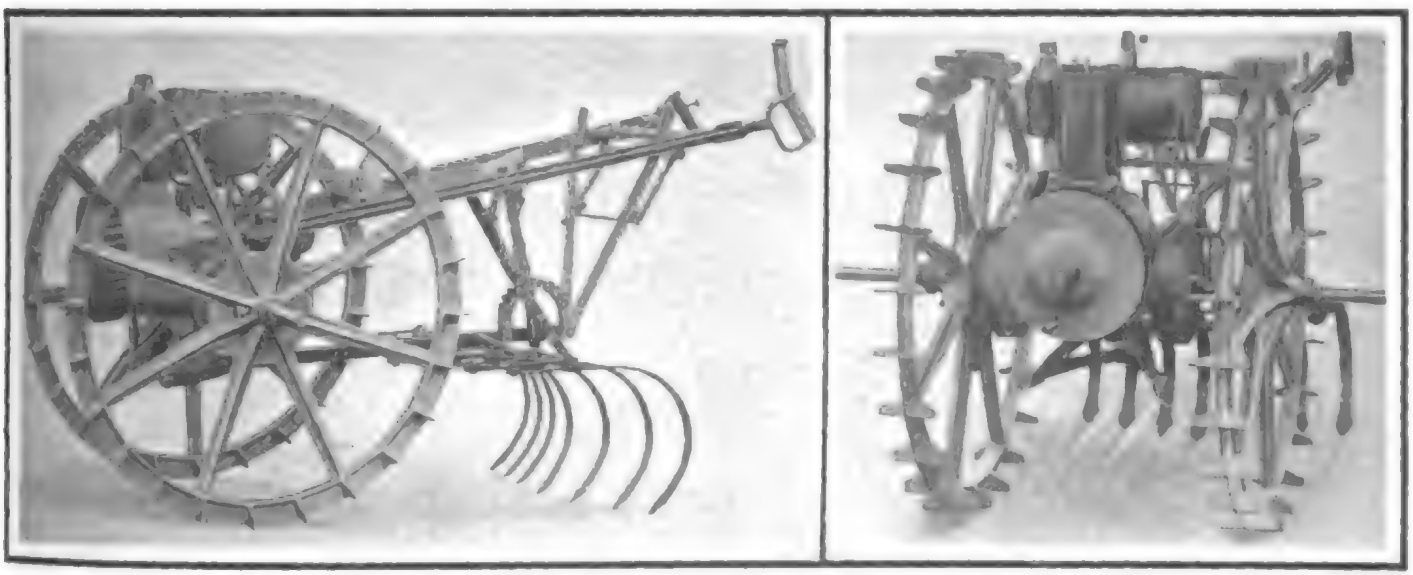
Under the name of the Universal Tractor Co., of Newcastle, Ind., a company has been formed to manufacture the machine, which is the invention of T. B. Funk, of Indianapolis, Ind., an automobile man. A plant has been acquired at Newcastle, and it is anticipated that manufacturing operations will be conducted on a large scale and that machines will be ready for the market within a short time. An excellent idea of the general appearance of the machine is given by the accompanying illustrations.

The tractor is designed not only to do the work of a horse, but to be handled to some extent in the same way as a horse. That is to say, the "driver" walks behind the machine, holding a pair of handles by means of which he controls its direction, and the speed and other levers are brought back within easy reach. There are but two wheels, mounted on a live axle, driven by a 5-horsepower single-cylinder gasolene motor carried at the center of the axle on a casing that is integral with the casing enclosing the driving and differential gears. A pair of brackets attached to the bottom of the casing serves as point of attachment for the implement to be used—cultivator, drill, seeder, etc. The weight is so accurately balanced that the driver, with the long handles provided, has no difficulty in keeping the machine at the proper level. The torque of the motor is opposed to and balanced by the resistance offered by the implement if the resistance offerd by the teeth in the soil increases the torque of the motor automatically increases in the same proportion, maintaining the equilibrium.

The wheels are of steel, of large diameter, and are provided with transverse paddle-like plates to afford a grip in soft ground. The axle shafts carrying and driving the wheels are keywayed and the wheel hubs are splined, so that the wheels can be set for any tread within the limits prescribed by the length of the shafts; the minimum is 23 inches and the maximum 42 inches.

An automatic governor on the motor permits nice control of the speed, which naturally is normally about the rate of a brisk walk. The motor has sufficient power to keep an ordinary cultivator going through heavy, sodden soil, or uneven ground, at the rate of three miles an hour with practically no vibration. A lever is provided to regulate the depth of the teeth or blades in the soil.

By applying suitable pulleys—which, incidentally, form part of the equipment of the little tractor—any machinery requiring not more than 5 horsepower can be driven; the machine will, of course, propel itself to the place where it is to work. The usefulness of the engine does not necessarily end with the day, for it can be utilized even to drive a generator to produce current to electric light the farmer's home.



SIDE AND END VIEWS OF FUNK'S ONE-MAN ONE-CYLINDER COMBINED CULTIVATOR AND PLOW

A. C. A. to Dispose of Laboratory.

Unless something unexpected happens between now and March 1 the Automobile Club of America on that date will abandon the use of its completely equipped testing laboratory at the top of the club building in New York. It has been utilized so rarely that it has been definitely decided that the annual deficit of about $5,000 incident to its maintenance is too heavy to be borne any longer. There is at least a possibility that the plant will be acquired by the Society of Automobile Engineers and removed to Detroit, or else operated in New York on a co-operative plan of some sort. Members of the A. C. A. feel that if the club must lose the laboratory it ought to go to the S. A. E., and many of the engineers are said to be enthusiastically in favor of taking it over. Whether their enthusiasm reaches the intensity necessary remains to be seen.

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GENERAL VIEW OF THE COLISEUM EXHIBITS AND OF THE "STAINED GLASS" ROOF

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CHICAGO'S "CATHEDRALIZED" CARS

Western Metropolis Again Provides a Striking and Bewildering Setting for Its Annual Show—Exhibits Emphasize the Trend Toward "Sixes"—Electrics Present in Strong Force and Disclose the Result of Refining Efforts

If that man Miles who runs these here Chicago shows for the National Association of Automobile Manufacturers does not change his ways, he is likely to "get in bad" with the Society of Professional Automobile Photographers and to be the direct cause of a strike of the Descriptive Writers' Union.

From the photographers' standpoint, it was bad enough when he imported genuine English walnut trees from the vicinity of Evanston, Ill., and upreared an English country estate within the Coliseum building and set the show of automobiles under the spreading branches of the walnut trees; the Writers' Union didn't mind that so much; it is easy to call a tree a tree; but photographing trees in a subdued light isn't exactly as simple as the saying of it, and the unhappiness of the S. P. A. P. dates from about that time.

Decorations That Defied Description.

It was pretty bad, too, the following year when Miles—Samuel A.—staged the show in a Louis XV. setting and fashioned plaster of paris and other stuff into all sorts of mounds and pillars and curlycues and what-you-call-'ems and splashed them all with more colors than ever were found in Joseph's coat—that, as stated, was pretty bad; but last year, when this same Miles, with the assistance of his Chicago artists, created what they called a mosaic temple and then laid back and gave voice to a truly hearty haha when he was asked to describe it and admitted that neither he nor his artists could do it—when he did that sort of thing, the seed of discontent was planted deep in the Descriptive Writers' Union, while the Photographers' Society tore out whole handfuls of hair from the heads of its devoted members in an effort to obtain the proper light to admit of photographing the bewildering display to advantage.

Evolution of the "Cathedral" Idea.

Miles could afford to lie back and enjoy this sort of thing, for, even if he himself could not describe them, his spectacular dressings of the Chicago shows were not only original and daring but eye-pleasing beyond all doubt. The public enjoyed the spectacle, so why reck of the despair of photographers' societies or the anguish of writers' unions? In strict confidence, it is possible to state that Miles did no recking during the twelvemonth that elapsed since the mosaic temple graced the Chicago Coliseum. Instead, he dined his artists on lobster and ice cream and Russian caviar and Welch rarebit and wined them with absinthe. The result was made apparent on Saturday afternoon last, when the Coliseum was thrown open on the 13th in the Milesian line of automobile shows.

It certainly is not a crystal palace, and if the Writers' Union cared to get back at Miles for previous offenses it might say that he has profaned a cathedral by locating automobiles "in its midst." But the Chicago manager is too good a church member to indulge in profanation of the sort and, therefore, what looks like a cathedral is not a cathedral. The Writers' Union can touch lightly and call it a "stained glass show," and almost let it go at that; but the poor old photographers—what they call it cannot be repeated in print; it may sound emphatically artistic, but it doesn't look like it in cold type.



ONE OF THE ORNATE LAMP STANDARDS

Woes of the Men With Cameras.

Finding a name for what-you-call-'ems is hard enough, but when the chaps who operate cameras try to reproduce greens and yellows and blues and purples and every other old color that human mind ever conceived—and try to do it under a dome which is darkened by the very profusion of such hues—oh, say! when those camera chaps try to earn their salt under such conditions, their mouths foam and happy is the one who purchased a return ticket to his home. At best, theirs is a more or less hit-and-miss business, and—take it from the photographers who have snapped the Chicago shows—their misses are as numerous as the sands of the sea and their hits almost as scarce as the hairs on Reilly's head. As witnesses, let the court summon one Nathaniel Lazarnik, one Fed Spooner or one Charleywells, and, if need be, the world-famous John Doe.

Why Mirrors Are Few and Small.

Originally it was the intention to so mix stained glass effects and mirrors that the Chicago show must be styled a crystal palace, and although the National Association of Automobile Manufacturers and the Automobile Board of Trade—the latter of which fathered the New York show—occupy adjoining offices, with a connecting door between them, this Mr. Miles was not even let into the secret of the decorative scheme of the New York function. When he beheld the New York show itself and saw the use made of mirrors, and heard the Board of Trade dub its show—at least, that part of it

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SIDEWISE SLANT OF THE DISPLAY IN THE COLISEUM

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CLOSE VIEW OF THE "UPPERWORKS" SHOWING "TREATMENT" OF GALLERY AND THE "CATHEDRALIZED" PANELS

staged in Madison Square Garden—a crystal palace, this Mr. Miles, he did not exclaim ha! ha!; he said dammit and other things along that line.

When he had ceased to exclaim, he called together his Chicago trusties and made plain that, so far as concerned Chicago, a great and immediate shrinkage of mirrors was imperative. And the Chicago artists proved themselves equal to the task. Here and there on posts in the Coliseum and elsewhere there is a strip of looking glass, but of mirrored expanses there are none, but there are "stained glass" effects aplenty, also a bewildering revelry of colors.

Primitive Man in "Stained Glass."

Likewise there is a near-art gallery of "cathedralized" pictures drawn apparently from the Adam and Eve period, or soon thereafter. At any rate, the people in the pictures all are clothed after Mrs. Eve's own fashion. They look down upon the show, and if one is religiously inclined he may almost see religion in these pictures, even though a centaur that figures in several of the paintings is not known to have figured very largely in religious lore.

Although Chicago this year is housed in three buildings, as always the Coliseum is the "show place." It is there that the decorative hand finds the most room for its deft workmanship.

Decorative Scheme in Detail.

The arched roof itself is concealed by an enormous painting, the very center being a simulation of stained glass in two shades of blue. Adjoining the "stained glass" on either side are huge squares suggesting tapestry, which is half blended into heroic panels with mythological nude figures to which a "stained glass" touch also has been given. From the dome are suspended 100 small stained glass lights. The ends of the building are concealed by drop curtains, one of purely decorative design, the other suggesting an extension of the Coliseum and a stairway leading to it.

The rail of the gallery, on which the accessories are displayed, has been concealed by false work of red and gold and of a new and striking design. Directly below the rail, and where mirrors were to have been, is in many respects the cleverest conceit of the entire decorative theme—a series of landscapes framed in blue and gold and each separately lighted from above.

With all their skill and ingenuity, however, the Chicago decorators have not yet found it possible, artfully or artistically, to conceal the huge steel girders which support the dome and intrude on the gallery. They are there in all their nakedness, slightly softened only by a drapery of bunting. The exhibitors' signs on the gallery are of dark blue with gold lettering and are suspended from gold standards.

Main Floor "Cleaner" Than Usual.

The decorative treatment of the main floor itself is less obtrusive than in other years but none the less effective. There are gilded or bronzed standards of shapes which are reminiscent of last year's indescribable what-you-call-'em designs and that rear themselves high and are topped one by a cluster of five stained glass globes, the other,

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of slightly different design, by three similar globes. The latter standard carries the exhibitors' name, the letters, in gold, standing in relief on a square design of mottled and hammered bronze. At the corners of each separate central exhibit are gilded posts surmounted by potten plants.

Those exhibits on the main floor that are staged under the overhanging balcony have a background of green set in black wood framework. The under side of the gallery is concealed by a tapestry effect, the beams being hidden by a design of dark blue water and water lilies that are not so blue.

Embellishment of the Annex.

The Coliseum Annex, which directly adjoins the main building and is practically a part of it, has no lofty dome and does not lend itself to extreme decoration. The tapestry effect is carried onto the ceiling and the upper half of the wall, the lower half being hidden by the green background and dark framework. Long, narrow mirrors are set in the posts.

On the second floor of the Annex, the only decoration is a series of shields of heroic size pinned to the walls, each shield edged in red, white and blue and showing, in apparent relief, some form of vehicular progress from prehistoric time to the motor car of the present day.

The basement of the Annex, into which comparatively few penetrate, is more chipper than ever before. The green background and dark framework cover the walls, and there are mirrors on the posts, but for once not bunting but a frescoing of flowered design hides the uninviting rafters.

The Wilson building, which was brought into use this year for the first time, is dressed in keeping with the Coliseum Annex which it directly adjoins. The tapestry effect is on the ceiling and the upper wall and the green and black design on the lower hall.

Armory in Green and Gold.

"You're in Pneumonia Alley, even if you dont' know it," is the cheerful cry which greets those who leave the Coliseum display to visit the other half of the Chicago show located in the First Regiment Armory. It is the same old alley, but the man who loudly imparts the cheerful information was a newcomer who was "barking" for a drink dispensary which somehow has found a means of obtaining an opening into the alley. As always, the alley is cold and windy and the barker's suggestion of pneumonia was coupled with the plain intimation that the way to avoid it is by "warming up" in his establishment.

The armory itself suggests only faintly the "stained glass" or cathedralized theme of decoration. The light well is not concealed by "stained glass" or Adam and Eve effects but by the simple green and yellow bunting which has done duty in other years, and from the ceiling is suspended no fanciful or softly glowing lamps, but good old arc lights, and hanging greenery.

The relationship of the Armory and the Coliseum is more strongly apparent in the gilded and imposing lamp standards topped by "stained glass" globes; they are of the same pattern. The lower walls of the Armory also are hidden by the green with black framework, the upper portion being of yellow, which scheme of decoration also is applied to the overlooking gallery.

Bravery of Show and Salesmen.

But whether viewed from the Coliseum, or the Annex, or the Wilson Building, or the Armory, the Chicago show is a brave show and worthy of its many striking predecessors; and some of the men who display their cars amid the splendor of these trappings are brave men.

When one of them was asked to enumerate his models, he laid much stress on what he styled "the 'coop' over there." Wrinkling the brow and following his indicating finger served to make clear that at least in some portions of this great country "coop" is the equivalent of coupe.

REVIEWING THE CARS THAT ARE DISPLAYED UNDER CHICAGO'S "STAINED GLASS" ROOF

Of the 22 brands of cars that were scheduled to make their initial appearance of the year, only one failed to "come to the line," so to speak. The missing one is the Diamond T, and its failure to appear, it is explained, is due to the fact that its producers are concerning themselves more directly with the manufacture of commercial vehicles. As was to be expected, in view of the revelations of the New York show and the unmistakable trend of the trade, much of the newness apparent in the 10 gasolene cars that make up half the list of "those not shown in New York" is of the kind that best can be spelled with the letters S I X E S. Of those 10 lines, no less than five contain new "sixes," and as two of the other five always have been "sixes" and nothing else, it may be appreciated that the Chicago show is just a little bit more a show of "sixes" than was the New York show, for with very few exceptions all of the six-cylinder cars that appeared in New York appear also in Chicago.

As a matter of cold fact, very nearly all the cars of either variety—"four" or "six"—that appeared in New York appear also in Chicago, and either by design or chance they occupy very nearly the same spaces in the Coliseum and the Annex and the basement that they occupied at the last Chicago show.

Directly in the center of the Coliseum, the Peerless stand is rendered more attractive by the presence of the striking double limousine finished inside in rich brown and gold and set off with yellow dome lights, that served to draw the eyes of those who visited the New York show. Also there is a white Peerless chassis that was not exhibited in New York and, though one of the principal reasons for its presence is to make plain the Gray & Davis electric lighting and engine starting system with which all Peerless cars are equipped, it also illustrates the many individualities of Peerless construction that serve to distinguish the line.

Familiar Names in Central Spaces.

Almost in the center of the Coliseum, and occupying the very same location as last year, are the Stoddard-Daytons, than which none excites more curiosity than the big six-cylinder Knight engine mounted in a luxurious appearing touring car finished in somber tones. And, of course, no show would be complete without the Stearns-Knight cars, and this exhibit, too, has been transplanted in toto. Among the other exhibits that "moved West" with scarcely a change there is the Packard, which is complete even to the inclusion of the "cabette"; the White, with its big double limousine and a new four-cylinder touring car finished in a delicate shade of green; the Premier, which is none the less attractive by reason of the absence of the "Killarney coleen cabriolet"; the Pierce-Arrow, with its impressive-appearing arched door limousines; the underslung Americans, including the new "six" that scored a "hit" on the occasion of its unexpected appearance at the New York show; Columbia-Knights, including a new one all finished in a peculiar shade of blue; the sleek-looking Fiats; the Speedwell, with its six-cylinder Mead engine; the Stevens-Duryea line, with its curved cowls suggestive of more than ordinarily careful thought in "blending"; the Knox and the Oakland cars, with their pointed radiators; the Hupmobiles, including the eye-catching "square" coupe with its dome ventilator in the roof; the Overland and all the other well-knowns are there, and not a few of the exhibits have been "livened up" by the addition of cars of brighter hue or different form.

At the Locomobile stand, for instance, there is both the double limousine finished

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in red and gold and the other finished in gray and silver that were shown in New York and, in addition, there is another car scarcely less pleasing in appearance. It is a touring car finished in gray with a broad band of pink at the top of the body line and wheels trimmed with the same shade of pink. Almost next to it, and flanking the "pin-wheeled" car that proved such an able demonstration of the air-cooling principle at the New York show, there is a yellow and black Franklin touring car, the coloring of which is well set off by the slanting hood and the straight-line body. A little

Where bright colors fail to hold attention, there are the moving exhibits—the silently starting engines, and some that do not start quite so silently, the "working" engines and the chassis that "run" under the gentle persuasion of electric motors. Also there is a lecturer, or, rather, two lecturers, who discourse the whys and the wherefores of Rambler cars to a crowd that does not even stop wondering after the most careful explanations. The "internal economy" of the Hudson—the crankshaft with the camshaft right back through the gearset to the rear axle—is polished and working as smoothly as it was in New York; the Reo engine is started with the aid of its "self-starter," as the talkative salesman calls it, as much as it ever was; Cartercar wheels whirl in the Annex when the silently rotating disks of its friction transmission are brought together; the Chalmers "factory exhibit" is there complete, even to the "factory man" in overalls and a jumper; and over in the Armory, Great Western parts are shown on a revolving table that revolves so fast that no one can keep pace with a single part long enough to examine it carefully.

offer. Among all the "sixes" that make their initial appearance, there is only one real surprise, and that the Colby. Every one knew, for instance, or ought to have known, that there would be new Staver, Midland, Crow and McIntyre "sixes," for the information was conveyed in Motor World's great Before Shows Issue, which appeared three weeks before the New York show opened its doors. Consequently, there is nothing new in the mere knowledge that these new "sixes" really have appeared, though there is not a little that is new in the cars themselves.



ONE OF THE ARMORY AISLES IN WHICH ELECTRIC CARS HOLD FULL SWAY

further along, a clever gray Garford roadster blinks a baleful single "eye," the rays of which glint on the polished side of still another Garford not seen by New York eyes—a brown creation upholstered in cloth instead of in leather. Color is a great deal more rampant than it was at the New York show, and wherever the eye may light it is nearly sure to encounter "something lighter and something brighter"—here a yellow-sanded brown Pope-Hartford, there a cream-colored Kissel roadster, a red Cole "six," a still brighter red Glide roadster, a dark green and gold Winton roadster, and almost any number of others, including the gold and white Krit that appeared in New York and the one altogether inappropriately white White.

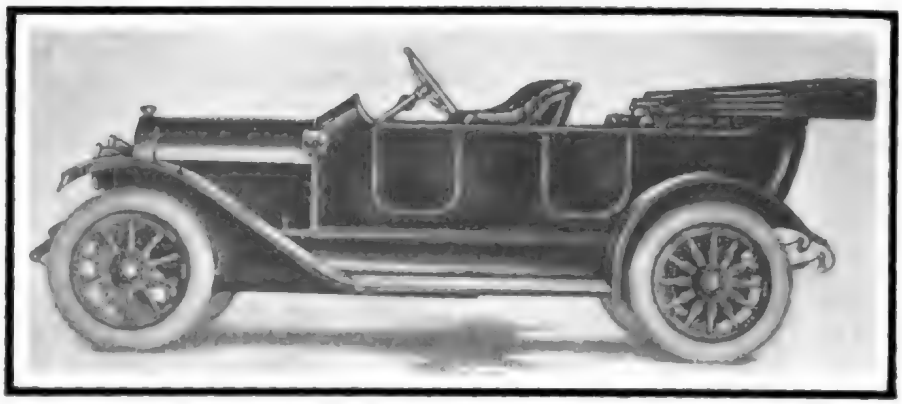
Surprise in the "Sixes" That Appear.

But to get back to what is new in the show—what is new to those who already have seen what the New York show had to

In the new Colby "six," which, by the way, lists at $2,500 and is completely equipped at the price, there is apparent a studied attempt to produce an harmonious whole in which no single fixture or feature obtrudes itself too suggestively. The lines of the body are well blended and the manner in which the windshield is attached to the deep skuttle dash is only one little indication of the careful manner in which the plans have been laid down. The windshield is made an integral part of the cowl; there is no filler board and there are no rods, struts or straps to obstruct the vision of the driver or the passage of his body. As for the essentials of the car, they reflect no less careful thought in selection. The motor forms the principal portion of a three-point

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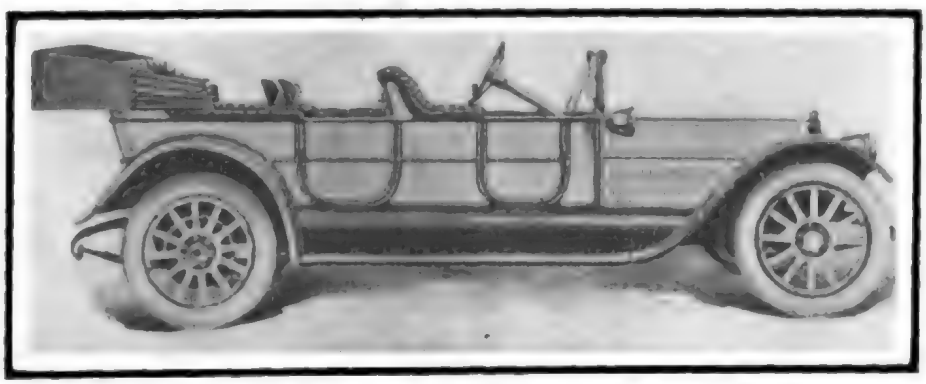
supported unit power plant, which, as should be the case, includes also the electric lighting and engine starting equipment; bore and stroke are 4⅛ x 5¼, respectively. For the rest of the car, suffice it to say that such standard products as Timken axles and Gemmer steering gear and other equally well-known parts enter into its make-up; the wheelbase is 135 inches.



SIDE VIEW OF NEWEST COLBY FOUR-CYLINDER MODEL.

New "Fours" That Swell the Ranks.

Carrying the same construction to its logical conclusion, which means through the rest of the line, two brand new "fours" which also make their initial appearance, make up in a measure for the absence of the underslung Colby, which appeared first at the last Chicago show. Of these two, the smaller is essentially a duplicate of the "six" with two cylinders left off and a Thurber rotary air starter in the place of the electric starter; the larger has a 4½ x 5½ motor and all have their steering gears at the right side with the gear shift and emergency brake levers placed in the center of the footboard.



AUSTIN MODEL "77" WHICH HAS LONGEST STROKE MOTOR

Increasing Popularity of Block Casting.

Apparently, the popularity of block casting for "sixes" grows apace, for of the four other new "sixes" both the Staver and the McIntyre have block-cast motors, while the McFarlan, which is not new, though it is almost new because it has a new motor, appears for the first time with all of its six cylinders in a single compact casting. Thus is rigidity obtained, efficient cooling ensured and a multitude of disadvantages inherent in singly cast cylinders overcome; not the least of which is the difficulty of obtaining and maintaining perfect alignment under possible frame weaving and generally bad road conditions. Another feature of construction which is common to all three motors is that in each the intake and exhaust valves are located on opposite sides of the cylinders, thus lending greater emphasis to the accomplishment of a method of construction which not so very long ago was viewed as practically impossible.

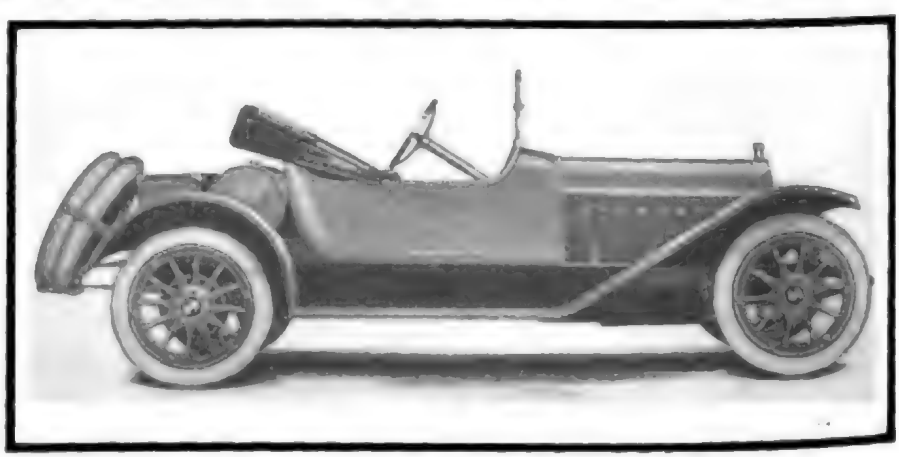
Comparing these three motors as regards their cylinder dimensions reveals that the Staver measures 4 x 6, leaving plenty of room for the development of the 70 horsepower at which it is rated; the McFarlan dimensions are the same, and the McIntyre motor measures 3½ x 4½, thus more properly being in the "little six" class; it is rated at 40 horsepower. Except that these three motors are all "sixes," they have very little else in common; each has its own individualities.

Thus, for instance, the Staver motor is an exceptionally clean appearing casting with the manifolds integral and the carburetter carried at the end of a very short intake pipe of liberal dimensions. Another of its peculiarities is the manner in which the lighting generator, which is a Berdon instrument, is driven. Instead of being driven from a straight-through shaft, as is the usual manner, or by chain, it is driven by internal gearing cut on the inside periphery, if such it may be termed, of the pulley from which the cooling fan is driven; the arrangement is shown by the accompanying sketch.

Variety in Generator Mountings.

In the McFarlan motor, on the other hand, the lighting generator, which forms part of a Vesta system, is mounted nearer to the flywheel and is driven from the pump and magneto shaft in the orthodox manner. This motor also is noticeably "clean" in appearance and, despite its equipment of lighting generator and a four-cylinder air compressor, there is plenty of room to get at the valves and to make necessary adjustments. The method of driving the air pump, by the way, has been changed slightly, and that handy device now is driven from the timing gear train by means of a short shaft and a positive clutch instead of through gearing. The pump serves also to supply compressed air for the starter, which consists essentially of a rotary distributing valve which admits the air to the cylinders in the proper firing order until they take up their own cycle of operations.

First glance at the McIntyre power plant reveals a rugged-appearing motor set ex-



MIDLAND "SIX" ROADSTER WHICH SELLS FOR $2,385

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ceptionally low in the frame—so low, in fact, as to suggest that in obtaining the stability which the construction permits road clearance must have been sacrificed. But such is not the case; in fact, the road clearance is even greater than it is in the avearge car, the lower extremity of the flywheel, which is the lowest point, being nearly a foot from the road surface. Despite this fact, however, the center of gravity of the car is low, the bulk of the weight being practically in the same plane as, or lower than, the center of the wheels. That the motor itself is distinguished by the latest engineering practice is revealed by the fact that the camshafts are driven by "silent" chain. The lighting and starting equipment is from the shops of the Westinghouse company.

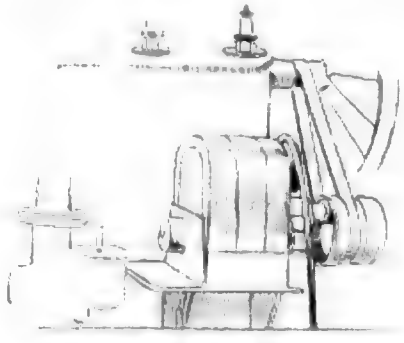
Short Center Control Levers Increasing.

To get a little further back and examine the cars that mount these motors, all three have well proportioned bodies in which deep skuttles are prominent. In the McIntyre, the skuttle is so deep that it has been made to do duty in carrying the gasolene tank, which is filled from the outside in approved fashion through a large opening. Incidentally, and also reflecting modern practice, the windshield is not an accessory either in appearance or fact. It is supplied with the car and is cleverly built in place and supported by short struts forward to the dash proper. The upholstery is deep and the seats wide and no hindrance to the entrance and exit of the driver is offered by the single short control lever placed in the center of the footboard; the car is driven from the right side.

The same short levers placed in the center of the footboard also are a feature of the Staver "six," only there are two of them—one for the gear shift and one for the emergency brake—as against the one used in the McIntyre. Also, as becomes the larger motor, the Staver car is larger all over—it is a much heavier and roomier car, as might be expected from its higher price. One of its little "kinks" that ought to relieve fatigue while at the same time improving appearance is the manner in which the upholstery is carried clear along the tops of the doors to form an effctual "buffer" for thoughtlessly wielded elbows.

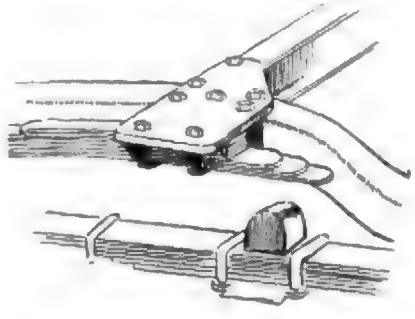
Radius Rod Elimination Continues.

As for the other cars in the Staver line, they reflect in an unmistakable manner the general tendency toward the elimination of as many parts as possible, the particular parts that have been eliminated being the radius rods, which feature is held in common by a great many other cars in which simplicity has been made a fetish. The springs take the place of the radius rods in all the Stavers; they are firmly shackled at the forward end to permit of rigidity of drive. Another noteworthy feature of the rear springs, which are of the three-quarter elliptic variety, is the manner in which a few of the top leaves have been extended past the spring bracket to act as a stop for the rubber buffer mounted on the axle. The idea is not new, of course, though it is new for the Stavers. By way of supplying the generally prevalent demand, both the "six"



STAVER DYNAMO DRIVE

and the smaller of the two "fours" have their steering wheels placed at the left side for the first time. Both of these models are equipped with Esterline electric lighting and starting equipment, and on the larger "four," which is rated at 55 horsepower, the option is given of either air or electric starting apparatus.



STAVER SPRING AND BUMPER

The McFarlans, of course, always have been equipped with air starters, though, as already has been mentioned, the method of driving the air pump has been much improved, the net result of the new arrangement being greater quiet and a more positive drive. Also, there has been added a Vesta electric lighting system and the rest of the equipment has been increased simultaneously with a change from semi-floating to full-floating rear axles and from an under-the-seat gasolene tank to one located in proximity to the rear axle, from which the fuel is fed under pressure to the carburetter. All of these improvements are features of the one new model that has been added—the one that mounts a 4 x 6 motor—and apply also to the older cars.

Both of the other new "sixes" that make their initial appearance, or, rather, all three of them—the Midland and the two Crows—also have T-head motors, though they differ in that the Midland cylinders are cast in threes, or, as the salesman says, in "trays," and the Crow engines have their cylinders in pairs. The dimensions differ, of course, the Midland motor measuring 4 x 5 and the two Crows measuring 3½ x 5 and 4⅛ x 5¼, respectively, a "little six" and a "big six."

Enlargement of Brakes a Feature.

From the side, and barring the homogeneousness of the whole car, if such it may be termed, the most conspicuous feature of the new Midland is its exceptionally large brakes; two sets are provided, of course, internal expanding and external contracting, and the drums are no less than 16 inches in diameter and 2¼ inches wide: they are lined with Raybestos. Naturally, the body is a straight-line creation with a deep cowl, affording the maximum of protection to the driver without unduly obstructing the forward compartment. The specifications of the car include a multiple disk clutch, three-speed selectively operated gearset with the control levers in the center of the footboard and the steering wheel at the left, and full-floating rear axle; the wheelbase is 135½ inches.

Price Revision Despite More Equipment.

Featuring the same type of integral windshield that is conspicuous on even more Western cars than it was on the products from more Easterly factories that were exhibited in New York, the Midland "four," which has as one of its distinguishing marks an unusual type of three-point motor suspension—it is common to the "six" as well—has suffered several important changes since last it was exhibited, and not the least important of them is the fact that the price has been revised and now is $1,685 instead of $2,100. And this despite the fact that the equipment has been materially increased and now includes a Gray & Davis electric lighting and engine starting system. Bodies also have been revised, the single example of Midland four-cylinder construction revealing an uncommonly "clean-looking" body with an overhanging skuttle formed integral with the front body panels. The car is larger throughout than it has been in the past, the wheelbase having been increased from 115 to 122 inches, and the control has been shifted from the right side to the left side, with the levers in the center. Reflecting the liberality of the manufacturers in the matter of equipment, either leather upholstery or "Moto-Kloth" upholstery may be had at the option of the purchaser, the car on exhibit revealing that

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the latter is an uncommonly soft material, like whipcord, which does not suggest either by appearance or feel that it is thoroughly waterproof and wear-resisting to a degree not even surpassed by leather.

Crow Adopts Center Control.

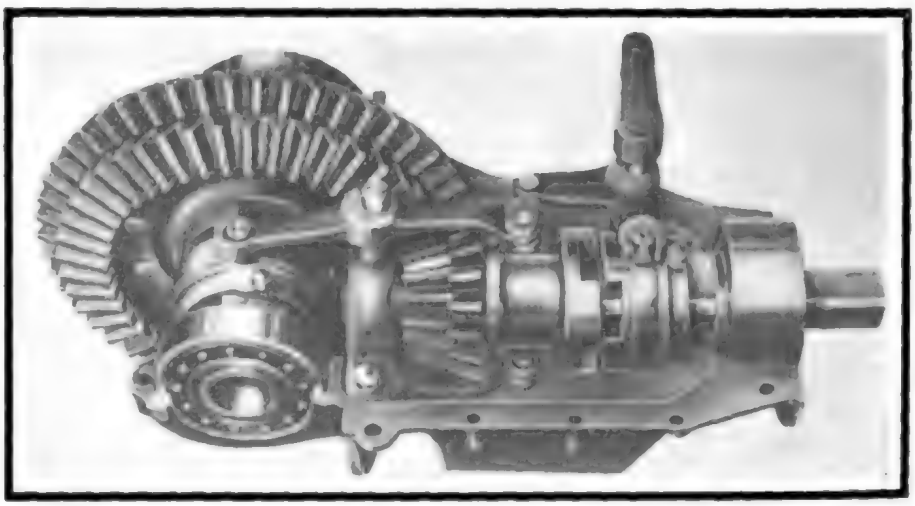
Leather upholstery only is used in the Crows, and though the method of control employed is like that employed in the Midland in that the levers are placed in the center of the footboard, the steering wheel is at the right instead of the left and the gear shifting arrangement is distinctive by reason of the fact that no lateral movement of the lever is necessary. The gate change, instead of being horizontal, is vertical, a simple forward and back movement sufficing to engage any of the three forward speeds or reverse—selectively, of course. Though the arrangement is not new and has been used on Crow cars for some time, this is the first time the levers have been placed in the center of the footboard, and, as a matter of fact, that is practically the only alteration in construction that has been made during the past twelvemonth by the Crow manufacturers.

Naturally, the two "sixes" are the center of attraction, for they are new all the way through, though there is nothing radical in their make-up. The smaller of the two has its motor hung very low in the frame, thus permitting low center of gravity and a practically straight-line drive when the car carries its full complement of passengers, and both are equipped with electric lighting and engine starting systems. The larger car is a roomy seven-passenger touring model and the smaller one is only slightly less roomy, though it provides accommodations for only five passengers; wheelbases are 122 inches for the smaller and 137 inches for the other. In common with all the other cars in the Crow line, the new "sixes" are finished throughout in nickel plate and fully equipped.

Two-Speed Differential in Austin.

Of the other "sixes" unrevealed by the New York show, there is only one—the Austin—and it is the same car that appeared last year and the year before that, except that a few purely minor improvements have been made qpite as a matter of course. Thus, for instance, the air compressor for tire inflating and to operate the starting gear now is located on the gearset instead of on the engine base, the valves have been enclosed and substantial bearings have been added at the forward ends of the camshafts. Otherwise it is the same Austin it always has been, with its valve pockets cast catacornered in order to provide room for the throw of a crankshaft which reveals one of the longest stroke motors in the show—seven inches—and its familiar tan and white body.

Nevertheless, the Austin exhibit, despite its familiar features, still harbors one of the few real novelties of the show, apparent in a brand new two-speed differential mechanism with which all Austins eventually will be equipped. For the present, however, it will be supplied only on demand, and at a slight additional cost. In its material aspects, the Austin two-speed axle, as it is styled, is much like the Evans and the Lancia and one or two others that have appeared within the past year or two and in which there are two bevel gears and two bevel pinions, thus permitting two rear ratios on final drive. It differs, however, in the method of engaging the gears, the arrangement being made plain by the accompanying illustration.



AUSTIN TWO-SPEED AXLE SHOWING CLUTCHING MECHANISM

Eight Forward Speeds Possible.

For the lower gear ratio, the outer bevel wheel ring, which is positively connected to the driving axles—through the differential mechanism, of course—and is meshed with its pinion, is driven by connecting the pinion to the drive shaft through a positive dog clutch. The other bevel gear, which is enmeshed with the other pinion, which, in turn, is positively connected to the driving shaft, then rotates idly. For high gear ratio, the remaining bevel gear ring is connected to the driving axles through the intermediary of a dog clutch, the arrangement of the shifting lever being such that a push engages high gear and a pull engages low speed, or vice versa, depending upon the method of "hook-up." Consequently, combining the two-speed rear axle with the orthodox type of three- or four-speed gearset results in the realization of either six or eight forward speeds and two speeds reverse.

Of the three four-cylinder cars that make their first appearance of the year—the Glide, the Pratt and the Great Western—it is difficult to determine which attracts the most, the Glide for its simple and substantial construction, the Pratt for its new 50-horsepower model or the Great Western for the big slice cut off its price, in spite of a whole lot of real improvement. The three have very little in common except that they are all completely equipped. The Pratt is new throughout, and though it contains all the previous Pratt features it also incorporates a number of departures from former construction, and both the Glide and the Great Western have been improved in a number of ways that have altered their constructions and their appearances not a little.

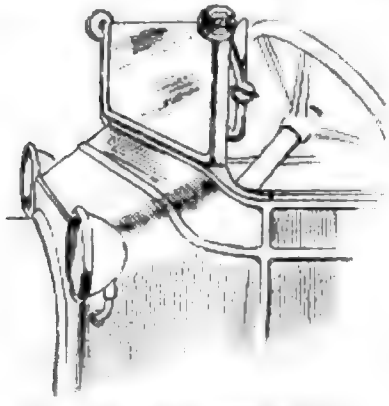
Both of the latter two, for instance, have longer wheelbases than they have had in the past—both have been "stretched out" four inches. Also, both of them have more powerful motors. The adoption of an L-head motor for the Great Western, and its support at three points on the main frame mark significant changes from previous construction in which an overhead valve motor mounted on a sub-frame was used. In order to compensate for the measure of power claimed to have been lost by the change in the location of the valves, the stroke has been increased from five inches to 5½ inches, the bore remaining the same at 4½ inches. In the Glide the increase in power is represented by an increase in cylinder dimensions from 4¼ x 5 to 4⅛ x 5¼, thus placing the motor more properly in the long stroke class; it is rated at 38-42 horsepower and the Great Western, of course, is a "40," as it always has been.

Glide and Great Western Changes.

Another important change in the Great Western is the adoption of a full-floating rear axle in place of the semi-floating axle that has done duty in the past. The Glide rear axle always has been floating, and there has been no change in it, though a

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new type of pressed steel housing has been adopted by way of increasing the factor of safety and permitting a greater degree of accessibility. Incidentally, to both the Glide

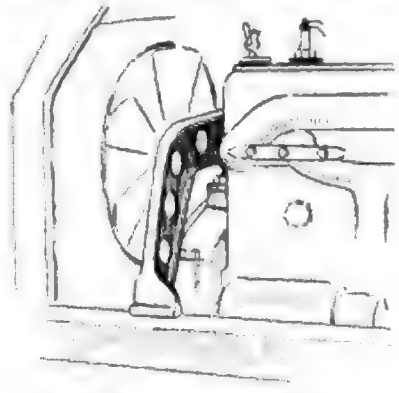


COLBY INTEGRAL WINDSHIELD

and the Great Western there has been added complete electric lighting equipment, Ward Leonard apparatus finding a place on the former and the Remy system being used on the latter. At slight additional cost, an electric starter is added to the Great Western, and the Glide already is equipped with an acetylene starter, chosen because of its simplicity.

Regarding body styles, there is not much that can be said, for neither departs radically from the standard and accepted practice. In both, the upholstery is deep and the seats are wide—particularly wide in the case of the Great Western. The Glide is steered and controlled from the left side, the levers being in the center for the first time, and as heretofore the Great Western has its steering wheel at the right. In the Glide there is a clever interpretation of the integral windshield idea so prevalent elsewhere. The shield is mounted directly on the cowl, to which it is shaped, without the use of a filler board, the glass itself being cut away to fit the curve of the dash; it is bound around with nickel plated metal, of course. The struts are very short and lead back to the dash in a manner that leaves the doors perfectly clear. There are two chassis in the Glide line, the "38-42" and a "45," which remains substantially the same, and as usual there is only one in the Great Western line.

The Pratt "50" is a new car throughout and, as becomes a new car, it is equipped with Gray & Davis electric lighting and engine starting apparatus. In adopting three-point support for the power plant which carries its dry plate multiple disk clutch and three-speed selective gearset in a unit, a slightly different method than is usual has been employed. In the older Pratt cars, the third point of support is in the rear, but in the new one it is at the front. The forward pivot is cradled in a bearing on a transverse webbed arm bearing at either

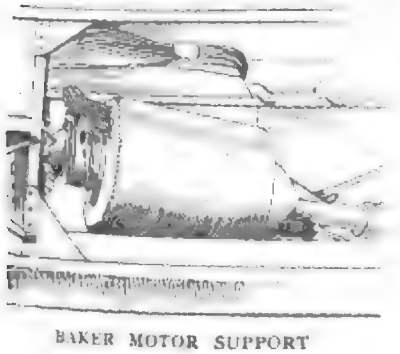


PRATT MOTOR SUSPENSION

side on the main frame, the arrangement being best made plain with the aid of the accompanying sketch. The bore and stroke of the motor are 4½ x 5¾ inches. Eleven-inch upholstery and plenty of room help to make the bodies comfortable, and everywhere the construction is orthodox, even to the placing of the steering gear at the right side with the gear shift and emergency brake levers inside the body.

PROGRESS REVEALED BY A STUDY OF THE ELECTRIC CARS

In the realm of the electrics, by far the most important development of the year, as revealed by the 11 brands of cars on view, is the widespread adoption of the direct shaft drive without the use of intermediate gears or chains. There is also apparent a tendency toward the use of larger, slower running motors to take the place of the small high-speed machines that have been

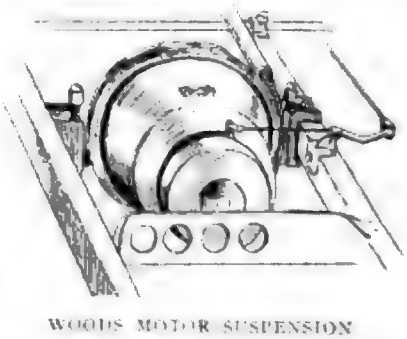


BAKER MOTOR SUPPORT

used in the past. Of all the 11 makes of electrics on view, no less than five of them—namely, Century, Ohio, Baker, Woods, and Broc—exhibit more or less radical changes in the method of supporting the motor and of driving; two others, the Borland and the Waverley, have slightly larger and slower running motors than they have had in the past, and the other three that are familiar to show goers, and those who are not show goers, alike, the Argo, the Rauch & Lang and the Detroit, remain substantially the same as far as their motors and the method of suspension is concerned, though each gives evidence of careful refinement. The Chicago electric, of course, is a brand new product that appears for the first time, and it, too, reflects the present tendency, for it is driven by a shaft without gearing other than that used in the differential.

Despite the preponderance of the direct shaft drive, however, no less than eight of the 11 makes exhibited being so constructed—counting the Waverley, which is shaft driven by a transverse shaft through herringbone gears, it is nine—no two of the cars are exactly alike, and altogether there is a great deal of variety in the method of supporting the motors and in transmitting the drive.

Examining first the five brands of cars in which the most conspicuous alterations in motor support and drive have been made—the Century, Ohio, Woods, Broc, and Baker—the Century motor has been moved further forward, though the method of drive remains the same, bringing it squarely in the center of the chassis instead of nearer to the rear axle, where it always has been. The arrangement, of course, permits a better distribution of weight, which has been further helped by splitting the batteries more nearly in halves. The Century, by the way, is one of the two cars on view in which the frame is supported beneath the axles. Also, since platform springs were eliminated by Woods engineers, the Century is the only one which retains them. Another new feature of the Century is the use of an improved type of Westinghouse



WOODS MOTOR SUSPENSION

controller in which a separate and distinct upward movement of the lever is necessary to reverse the car, thus obviating the possibility of inadvertently overloading the motor by reversing it with the car going forward.

Both the Ohio and the Baker motor suspensions are radical departures from anything that has come from either factory in

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the past. In the Ohio, the motor, which is of the slow-speed type, is bolted directly to a torsion tube, thus making of these two parts a rigid unit with the rear axle. The torsion tube is spread out fan-wise at its forward end to form a substantial yoke which attaches to the motor frame at the top and the bottom, a center universal bearing—not a universal joint, for there are none in the whole construction—being placed on the cross frame member and carrying the weight of the motor. Thus the construction is rigid, it ensures positive alignment of the parts under all conditions, and at the same time permits a degree of flexibility to offset possible frame weaving.

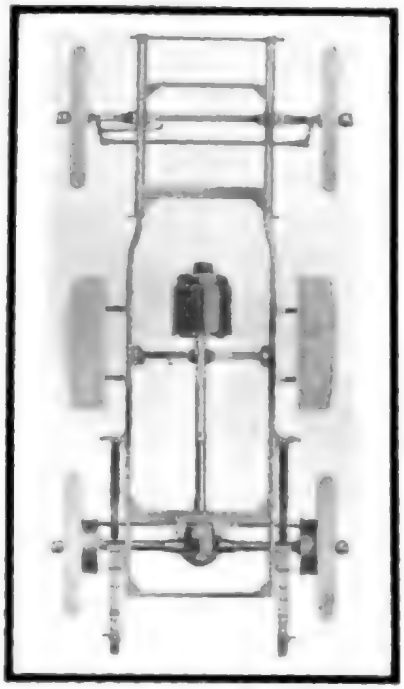
Another important alteration, or, rather, addition, is embraced in the adoption of a new magnetic brake which operates to slow the speed of the motor and thus the car. It is actuated by means of a small button mounted on the small circular knob which controls the magnetic switches for altering the car speed. Incidentally, the Ohio model brought out last year, in which double control sets were provided has proven so popular in the interim that several new models, all with complete duplicate control mechanisms, have been developed.

Variety Apparent in Motor Mountings.

Though the Baker is shaft driven, the method of mounting the motor is quite different from that employed in the Ohio. The motor is direct connected to the propeller shaft in much the same way, and also is direct connected, so to speak, to the torsion tube, but the method of hanging the forward end of the motor is entirely different. Instead of being carried at the end of the propeller shaft and at the opposite side of the cross frame member which supports it, the shaft is shorter and the motor is hung to the cross frame member by means of a large ball and socket joint leather covered to exclude dust and dirt. Strut rods from the rear axle to small extensions at the motor end of the torsion tube effectually prevent any alteration in the proper relationship of the rear axle and the motor with its propeller shaft. Instead of being located at the forward end, as it is in the smaller Baker electrics, the first speed reduction by Renold "silent" chain is contained in a unit housing with the rear axle.

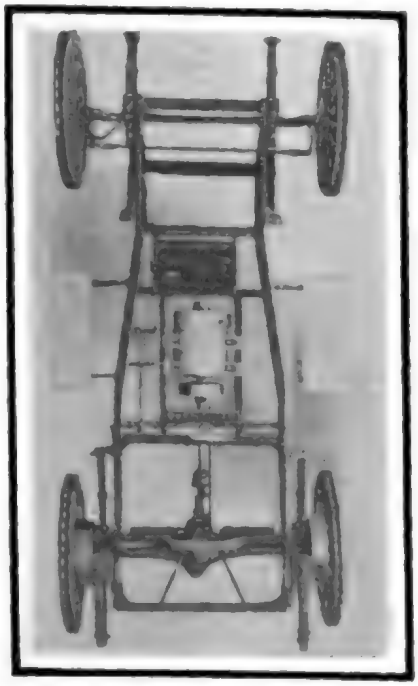
Forward Drive Cars Increase in Number.

Regarding Baker bodies, there is much that is new, though none attracts more attention than the coupe which is styled type VA. It is one of the few real coupes in which all the passengers face forward, which fact is made possible by the use of front seats which swivel. The car is longer and roomier than was its immediate predecessor and is distinctive by reason of its back, which suggests the limousine rather than the coupe; either lever or wheel steer is optional, and the top is so designed and constructed that water never is shed down



OHIO ELECTRIC CHASSIS

the sides of the car. The broughams, too, also exhibit the characteristic "limousine back" and incorporate a number of new features calculated to increase comfort.



CHICAGO ELECTRIC CHASSIS

Though the suspension of the Woods motor has been altered considerably, that change is not the most conspicuous one that has been made. The most significant change to be found in the elimination of the platform front springs that have served to distinguish Woods cars in the years gone by and the substitution of ⅞ elliptic members in their place. In altering the motor suspension, the engineers have swivelled the motor at the top and the bottom as well as the sides, thus permitting a greater degree of flexibility than was possible in the past, the arrangement being shown by the accompanying sketch. Simultaneously, the brakes have been equalized and made more powerful, a deeper drop has been put in the frame, the wiring has been enclosed in circular loom, the controller has been placed on the body instead of on the chassis, and the steering mechanism has been placed above and behind the axle, the better to protect it.

Drive Chains Eliminated by Many.

The Broc is another brand in which the method of transmitting power from the motor to the rear axle has been thoroughly revised, and in the revision the "silent" chain reduction that has been used in the past has "gone by the board," so to speak. In its place, there is a set of double reduction spur and bevel gears enclosed in the rear axle housing and the motor is direct connected to the forward end of the propeller shaft. Thus, though the chain reduction has been eliminated, the new arrangement permits the retention of the high speed light motor which always has been a feature of Broc cars. The cars themselves are quite a little bit larger than their predecessors—the four-passenger car, for instance, now accommodates five persons with ease—and to "fit in" with the lengthened wheelbases the wheels have been increased in size. Which, of course, is as good as saying that better stability and better riding qualities have been obtained by the change. Either wheel or lever steering is optional, as it always has been, and a new model in which all the passengers face forward has been added to the line. The Broc controller, in which forward movement starts the car and a pull back applies the brakes, is retained as a matter of course, though the arrangement has been improved by the addition of a locking device in the form of a small plunger, which effectually prevents the use of the car without the knowledge of the owner—provided he, only, has the key to the Yale lock.

Tendency Toward Larger Motors.

Of the other five electrics, not including the Chicago, which is new throughout, both the Borland and the Waverley have motors that are slightly larger than those that have been used in the past—the Borland is more than 10 per cent. larger and operates at a correspondingly lower speed. In the Waverley both the motor and the axles have been made heavier the better to withstand

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the strain of unwitting abuse and also to increase the general efficiency of the vehicles. Batteries of greater capacity are used in both, quite as a matter of course. About the only other change that has been made in the Waverley is embraced in the addition of a set of emergency brakes on rear wheel drums and the adoption of a new type of semi-irreversible steering gear, which is calculated to minimize the amount of road shock transmitted to the driver.

In the Borland, a ball thrust joint has been placed in the torsion tube and a well-studied attempt to reduce the annoyance of incipient rattles is apparent in the use of "anti-rattlers," or small coil springs, in all the brake parts. Incidentally, an adjustment for taking up wear in the "silent" chain reduction has been provided, as has an outside adjustment for the rear wheel brakes. At the same time, an interlock between the brake pedal and the controller has been added, the effect of which is to throw off the current automatically immediately the brake is applied, and to prevent the effective use of the controller until the brake has been released. The wheelbase of the standard chassis has been increased from 93 to 96 inches, and no less than six new models, ranging form a coupe to a full-sized limousine with outside seats for the driver and a "flunkey," have been added.

Improvement in Seating Arrangements.

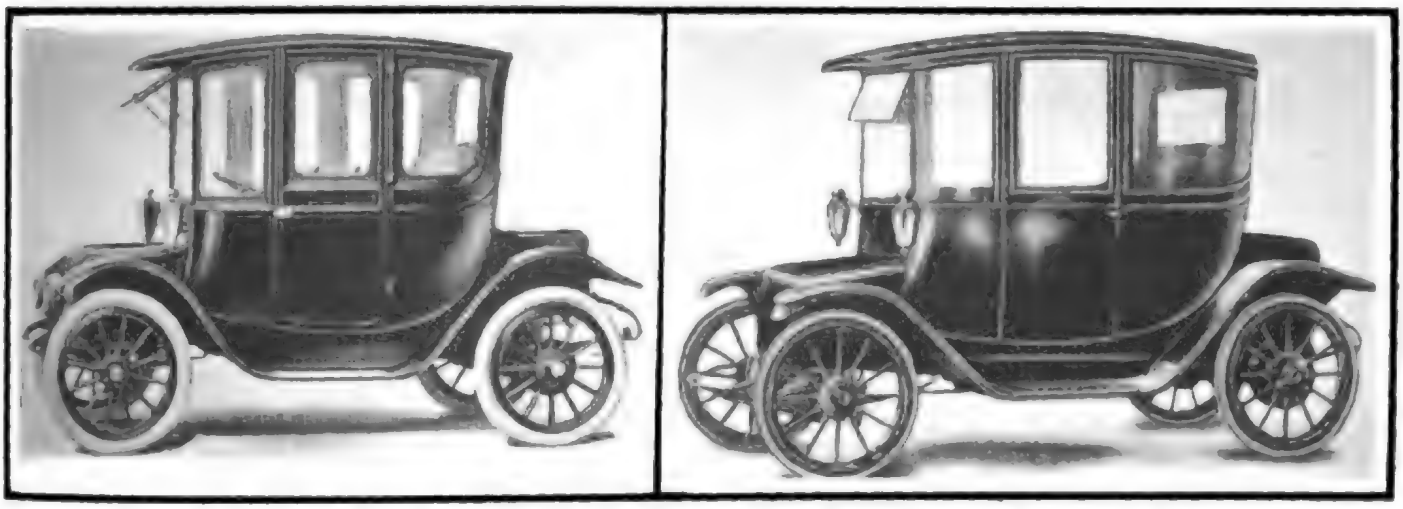
In body styles, the only real novelty that the show reveals is a Waverley bro——, no, it is not a brougham, it is a limousine, or, rather, a "limousine four," as it is styled, and the arrangement of the seats is most decidedly unusual. To crib a military term, the three main seats are arranged "in echelon," which is to say, the center seat is slightly further back than the others. Thus, there is plenty room for three seats in only a little bit more space than would be required for only two seats in the ordinary arrangement—and no one interferes with any one else.

Of the other three electrics, the Detroit, the Rauch & Lang and the Argo, none is marked by radical changes in mechanical construction, though each has minor refinements in chassis and in body work. Among the new bodies the Detroit cars loom large as truly distinctive creations; they are among the few really "clear vision" vehicles exhibited, for the driver is afforded a clear vision not only ahead of him but to the rear as well. Detroit electrics, by the way, always have been shaft driven cars—chainless shaft driven cars, to be explicit, for the power is transmitted from the motor to the rear axle through the intermediary of nothing more complicated than a perfectly plain and straight propeller shaft, the shaft is enclosed in a torque tube rigidly connected at the forward end to the motor casing and at the rear end to the rear axle housing. There is a single universal joint between the motor shaft and the propeller shaft to allow for slight disalignment.

"Clear Vision" Idea Is Paramount.

In making use of the words "clear vision," Detroit engineers evidently have designed bodies and seating arrangements so that there can be no quibble about the "fit" of the expression. Which is to say, there is nothing in front of the driver to obstruct his vision any more than there is anything beside him or behind him to prevent a clear vision of the road; doors and window sashes have been so placed that they do not come in the line of vision, and by replacing the rear opaque body corners with curved glass windows, which, incidentally, materially enhance the appearance of the bodies, the driver is afforded a view to the rear also, without the necessity for straining to peer through a small center window.

All of which is made plain in all of the vehicles on view, one finished in a lavish manner in blue silk whipcord and another in gold silk whipcord, appealing particularly to the weaker sex, which, to use a slangy expression, always is "strong" for the luxurious and the beautiful. It is one of the individualities of all the cars in the Detroit line that the driver's seat, instead of being tucked away in a corner, is placed very nearly in the center of the body, where there is little likelihood of the driver being mistaken for a "paid hand" and where he is in a position to be prominent socially—at least, while in the car.



TWO OF THE NEWER TYPE FORWARD DRIVE ELECTRIC BROUGHAMS—BROC AND WOODS



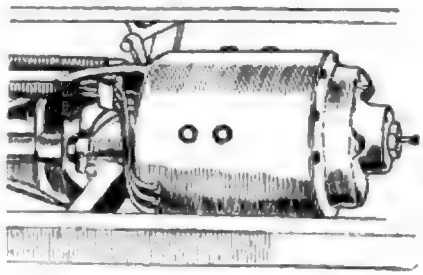
WAVERLEY SEATS "IN ECHELON"

Shaft Drive Popularity Increasing.

The Argo electric is another in which mechanical alterations are few and far between, though a number of body improvements, evident in several new models brought out within the past year, have been made. In its essential elements, the chassis remains the same, practically the only alteration being an increase in the size of the brake drums, which now measure 16 inches in diameter. The motor support and the method of drive remain the same, the motor being carried in a cradle on large combined tubular radius and torsion rods which unite in a hardened steel ball of large

diameter which, in turn, is supported by a spherical aluminum bronze socket. Drive is direct by shaft to the rear axle, where a double reduction spur and bevel gear is contained within the axle housing. Similarly, the method of control remains the same, a pedal serving to apply the power and also the brakes. In one of the new models exhibited for the first time, the driver's seat, placed forward, is a stationary chair, the other front seat being arranged to swivel so that the passenger may face in any direction, including forward. The rear seat is large and deeply upholstered, with plenty of leg-room between it and the front ones.

The most noticeable change in the Rauch & Lang electrics, paradoxically enough, scarcely is noticeable at all; the brakes have been made a little larger, the wheelbase of the standard chassis has been increased some 2½ inches, and the chassis has been lowered slightly to provide greater stability and to facilitate entrance and exit. On all of the models there has been added a separate rain-vision windshield outside of the regulation front glass panel, the effect of which is to prevent collections of rain on the inside glass obstructing the vision of the driver and his passengers, for, quite as a matter of course, all passengers face forward in the newer models. Two of the new features which have been added include an arrangement whereby the signal bell is caused to ring if any attempt is made to apply the power while the brakes are set, and an interconnection between the swiveling driver's seat and the control mechanism which automatically shuts off the power the instant the seat is turned in any direction other than facing forward. As heretofore, all batteries are accessible from the outside, thus obviating the possibility of acid damage to the upholstery and permitting the car to be locked while garaged and undergoing repairs.



OHIO MOTOR SUPPORT

Strictly speaking, there is only one really new electric in the show, and that one is the Chicago, which only a short time ago was put upon the market by the Chicago Electric Motor Car Co., of the Illinois city for which it is named, and which makes its first formal appearance. Taking their cue from those eminent gasolene car engineers who achieved an undoubted hit with the development of the arched door, Chicago electric engineers have adopted the idea as their own, thus marking the entry in the electric ranks of a style which heretofore has been used exclusively by the makers of spirit propelled cars. Briefly, the arched door is the most conspicuous point of difference between the Chicago electric bodies and any others.

Mechanically, the car is standard throughout, though there are several individualities that give evidence of careful thought. The motor, for instance, is solidly hung on the main frame by means of four extending arms and drives to the rear axle through the intermediary of a straight propeller shaft in which a pair of universal joints permit of the necessary flexibility. The brake, instead of being placed ahead of the motor, which is usual, is placed behind it and direct on the propeller shaft, eliminating the necessity for transmitting braking strains through the armature shaft. By way of reducing upkeep expense to the minimum, the chassis and the spring suspension have been designed primarily to permit of the use of cushion tires exclusively. Another distinctive feature is the use of a magnetic "blow-out" located over the controller fingers, the object of which is to prevent the arcing which nominally takes place and results in burned contacts and poor transmission of the current. As a coupe the car lists at $2,800, equipped with 40 cells of 11-plate Exide battery, and as a five-passenger limousine, at $3,100.

Summary of Cars which Constitute Part I of Chicago Show

* Denotes not displayed in New York.

Abbott Motor Co., Detroit, Mich.—Two four-cylinder Abbott-Detroit touring cars and one limousine; one chassis.

American Locomotive Co., Providence, R. I.—One six-cylinder Alco touring car; one chassis.

American Motors Co., Indianapolis, Ind.—Three American cars; one each four-cylinder roadster and touring; one six-cylinder touring; one four-cylinder chassis.

Anderson Electric Car Co., Detroit, Mich.—Four Detroit electric broughams.*

Argo Electric Vehicle Co., Saginaw, Mich.—Three Argo electric cars; one roadster and two broughams; one chassis.*

Auburn Automobile Co., Auburn, Ind.—Three Auburn cars; two four-cylinder touring and one six-cylinder touring; one six-cylinder chassis.

Austin Automobile Co., Grand Rapids, Mich.—One Austin six-cylinder touring car; one chassis.*

Baker Motor Vehicle Co., Cleveland, Ohio—Four Baker electric broughams; one chassis.*

Bartholomew Co., Peoria, Ill.—Two four-cylinder Glide cars: one each touring and roadster; one chassis.*

Bergdoll Motor Co., Louis J., Philadelphia, Pa.—Two four-cylinder Bergdoll touring cars; one chassis.

Borland-Grannis Co., Chicago, Ill.—Three Borland-Grannis electric cars: one roadster and two coupes; one chassis.*

Broc Electric Vehicle Co., Cleveland, O.—Three Broc electric broughams.*

Buffalo Electric Vehicle Co., Buffalo, N. Y.—Three Buffalo electric cars: one each coupe, roadster and brougham.

Buick Motor Co., Flint, Mich.—Four four-cylinder Buick cars: three touring cars and one roadster; one chassis.

Cadillac Motor Car Co., Detroit, Mich.—Four four-cylinder Cadillac cars: two touring and one each coupe and roadster; one chassis.

Cartercar Co., Pontiac, Mich.—Four four-cylinder Cartercars: one each double limousine, coupe, touring and roadster; one chassis.

Case, T. M. Co., J. I., Racine, Wis.—Four four-cylinder Case cars: two touring and one each roadster and coupe; one chassis.

Century Electric Car Co., Detroit, Mich.—One Century electric coupe.*

Chalmers Motor Co., Detroit, Mich.—Five Chalmers cars: two six-cylinder touring, two four-cylinder touring, one four-cylinder roadster.

Chicago Electric Motor Car Co., Chicago, Ill.—Two Chicago electric broughams; one chassis.*

Church-Field Motor Co., Sibley, Mich.—Two Church-Field electric cars: one each coupe and roadster.

Cole Motor Car Co., Indianapolis, Ind.—Four Cole cars: two four-cylinder touring and one roadster; one six-cylinder touring car; one six-cylinder chassis.

Colby Motor Co., Mason City, Ia.—Two four-cylinder Colby touring cars; one six-cylinder chassis.*

Columbia Motor Car Co., Hartford, Conn.—Three four-cylinder Columbia-Knight cars: two touring cars and one limousine.

Columbus Buggy Co., Columbus, O.—One Firestone-Columbus roadster.

Crow Motor Car Co., Elkhart, Ind.—Three Crow-Elkhart cars; two six-cylinder touring cars and one four-cylinder touring car.*

Cutting Motor Car Co., Jackson, Mich.—Two Cutting cars: one each touring and roadster; one chassis.

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Davis Carriage Co., Geo. W., Richmond, Ind.—Three four-cylinder Davis touring cars.

Dayton Motor Car Co., Dayton, Ohio—Three Stoddard-Dayton cars: one six-cylinder Knight engine touring car and two four-cylinder poppet valve engine touring cars.

Edwards Motor Car Co., New York City, N. Y.—One Edwards-Knight four-cylinder touring car; one chassis.

Elkhart Carriage & Harness Mfg. Co., Elkhart, Ind.—One four-cylinder Pratt touring car; one chassis.*

touring cars and one six-cylinder touring car; one four-cylinder chassis.

Henderson Motor Car Co., Indianapolis, Ind.—Two four-cylinder Henderson cars: one each touring car and roadster.

Herreshoff Motor Car Co., Detroit, Mich.—Two Herreshoff cars: one each four- and six-cylinder touring cars.

Hudson Motor Car Co., Detroit, Mich.—Three Hudson cars: two four-cylinder touring cars, one six-cylinder touring car; one six-cylinder chassis.

Hupp Motor Car Co., Detroit, Mich.—Four four-cylinder Hupmobiles: two touring each touring, roadster and double limousine; one chassis.

Kissel Motor Car Co., Hartford, Wis.—Five four-cylinder Kissel cars: three touring and one each limousine and roadster; one six-cylinder chassis.

Knox Automobile Co., Springfield, Mass.—Three Knox cars: two six-cylinder touring cars and one six-cylinder double limousine.

Krit Motor Car Co., Detroit, Mich.—Two four-cylinder Krit cars: one roadster and one touring.

Locomobile Co. of America, Bridgeport,



PACKARD EXHIBIT IN COLISEUM WITH A GLIMPSE OF THE PREMIER DISPLAY "JUST BEYOND"

F. I. A. T., Poughkeepsie, N. Y.—Two six-cylinder Fiat touring cars; one six-cylinder chassis.

Flanders Motor Co., Detroit, Mich.—Two six-cylinder Flanders touring cars.

Franklin Mfg. Co., H. H., Syracuse, N. Y.—Four six-cylinder air-cooled Franklin cars: three touring cars and one roadster.

Garford Co., Elyria, Ohio—Three six-cylinder Garford cars: one each touring, limousine and roadster; one chassis.

Great Western Automobile Co., Peru, Ind.—Three four-cylinder Great Western cars: two touring cars and one sedan.*

Haynes Automobile Co., Kokomo, Ind.—Three Haynes cars: two four-cylinder cars and one each coupe and roadster; one chassis.

Ideal Motor Car Co., Indianapolis, Ind.—One Stutz four-cylinder roadster; one six-cylinder chassis.

Imperial Automobile Co., Jackson, Mich.—One four-cylinder Imperial touring car.

Inter-State Automobile Co., Muncie, Ind.—Two Inter-State cars: one each four- and six-cylinder touring cars; one six-cylinder chassis

Jackson Automobile Co., Jackson, Mich.—Four Jackson cars: two four-cylinder touring cars, one four-cylinder roadster and one six-cylinder touring car.

Jeffery Co., Thomas B., Kenosha, Wis.—Three four-cylinder Rambler cars: one

Conn.—Three six-cylinder Locomobiles: one each limousine, double limousine and touring car; one chassis.

Lozier Motor Co., Detroit, Mich.—Four six-cylinder Lozier cars: three touring cars and one limousine.

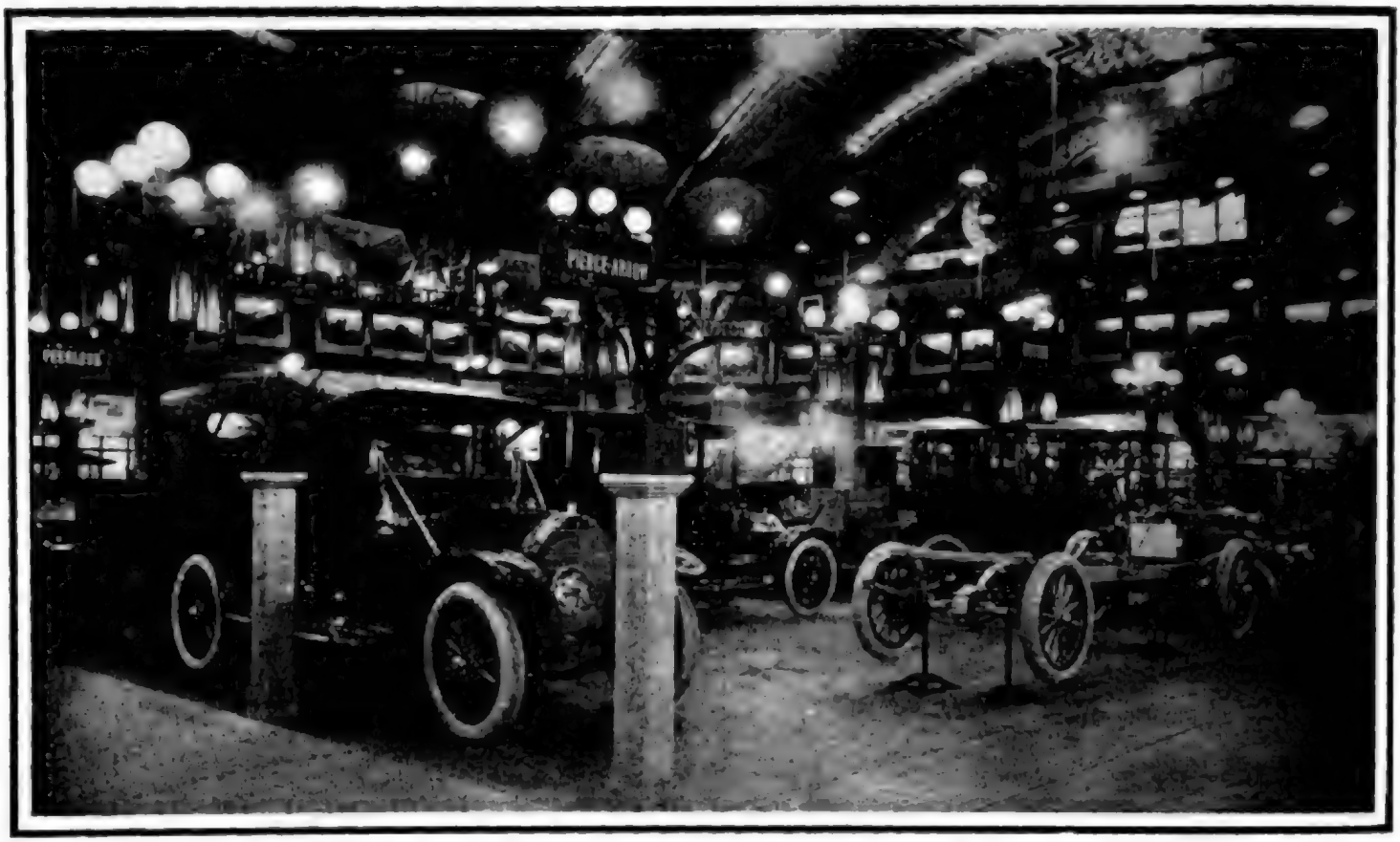
Marathon Motor Works, Nashville, Tenn.—Three four-cylinder Marathon cars; two touring cars and one roadster.

Matheson Automobile Co., Wilkes-Barre, Pa.—One Matheson six-cylinder touring car; one chassis.

Maxwell-Briscoe Motor Co., Tarrytown, N. Y.—Two four-cylinder Maxwell touring cars.

McFarlan Motor Car Co., Connersville, Ind.

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PIERCE-ARROW DISPLAY WHICH OCCUPIES A CENTRAL SPACE IN THE COLISEUM



GLIMPSE OF A COLISEUM AISLE WITH THE STUDEBAKER EXHIBIT IN FOREGROUND

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—One six-cylinder McFarlan car; one six-cylinder chassis.*

McIntyre Co., W. H., Auburn, Ind.—One six-cylinder McIntyre touring car.*

Mercer Automobile Co., Trenton, N. J.—Four four-cylinder Mercer cars: two each touring and roadster; one chassis.

Metz Co., Waltham, Mass.—Two four-cylinder Metz roadsters; one chassis.

Michigan Motor Car Co., Kalamazoo, Mich.—One four-cylinder Michigan touring car and chassis.

Midland Motor Car Co., Moline, Ill.—Two Midland cars: one each four- and six-cylinder touring cars.*

Mitchell-Lewis Motor Co., Racine, Wis.—Three Mitchell cars: one each six-cylinder roadster and touring, one four-cylinder touring; one six-cylinder chassis.

Moline Automobile Co., East Moline, Ill.—Two four-cylinder Moline cars: one each touring and roadster.

Moon Motor Car Co., St. Louis, Mo.—Three four-cylinder Moon touring cars; one chassis.

Motor Car Mfg. Co., Indianapolis, Ind.—Two four-cylinder Pathfinder cars: one each touring and roadster; one chassis.

National Motor Vehicle Co., Indianapolis, Ind.—Four four-cylinder National cars: two touring and one each limousine and roadster; one chassis.

Nordyke & Marmon Co., Indianapolis, Ind.—Two Marmon cars: one each four- and six-cylinder touring; one six-cylinder chassis.

Norwalk Motor Car Co., Martinsburg, Va.—Two six-cylinder Norwalk touring cars.

Ohio Electric Car Co., Toledo, Ohio—Three Ohio electric broughams; one chassis.*

Oakland Motor Car Co., Pontiac, Mich.—Four Oakland cars: two four-cylinder touring cars and one coupe and one six-cylinder touring car.

Olds Motor Works, Lansing, Mich.—Four Oldsmobiles: two each four- and six-cylinder touring cars.

Packard Motor Car Co., Detroit, Mich.—Four six-cylinder Packard cars: two touring and one each limousine and cabette.

Paige-Detroit Motor Car Co., Detroit, Mich.—Five four-cylinder Paige-Detroit cars: two each coupe and touring and one roadster.

Peerless Motor Car Co., Cleveland, Ohio—Three six-cylinder Peerless cars: one each limousine, double limousine and touring; one chassis.

Pierce-Arrow Motor Car Co., Buffalo, N. Y.—Three six-cylinder Pierce-Arrow cars: two limousines and one touring car; one chassis.

Pope Mfg. Co., Hartford, Conn.—Five Pope-Hartford cars: one each four-cylinder roadster, coupe and touring and one each six-cylinder touring and limousine.

Premier Motor Mfg. Co., Indianapolis, Ind.—Four six-cylinder Premier cars: two touring and one each roadster and landaulet.

Pullman Motor Car Co., York, Pa.—Four Pullman cars: two four-cylinder touring, one four-cylinder roadster and one six-cylinder touring.

Rauch & Lang Carriage Co., Cleveland, O.—Four Rauch & Lang electric broughams.*

CENSUS OF THE SHOW

Total Exhibitors		270
Exhibitors of Cars	93	
Exhibitors of Accessories	177	
GASOLENE CARS		
Four Cylinders	134	
Four Cylinders (sleeve valve)	6	
Six Cylinders	81	
Six Cylinders (sleeve valve)	2	
Six Cylinders (rotary valve)	1	
Total Gasolene Pleasure Cars		224
Touring Cars	153	
Roadsters	36	
Limousines	13	
Double Limousines	7	
Coupes*	13	
Landaulets	2	
		224
CHASSIS		
Four Cylinders	23	
Six Cylinders	20	
Electric	7	
		50
ELECTRIC CARS		
Coupes	8	
Runabouts	4	
Broughams	30	
		42
Grand Total Cars and Chassis		316

* Includes Sedans.

R. C. H. Corp., Detroit, Mich.—Three four-cylinder R. C. H. cars: one each roadster, touring and coupe; one Hupp-Yeats electric coupe.

Regal Motor Car Co., Detroit, Mich.—Three Regal cars: two touring cars and one coupe; one chassis.

Reo Motor Car Co., Lansing, Mich.—Three four-cylinder Reo cars: one each touring limousine and roadster; one chassis.

Speedwell Motor Car Co., Dayton, Ohio—Two six-cylinder Speedwell touring cars; one six-cylinder Mead engine chassis.

Selden Motor Vehicle Co., Rochester, N. Y.—One four-cylinder Selden touring car; one chassis.

Standard Electric Car Co., Jackson, Mich.—Two Standard Electrique coupes; one chassis.

Staver Carriage Co., Chicago, Ill.—Three Staver cars: two four-cylinder touring and one six-cylinder touring; one four-cylinder chassis.*

Stearns Co., F. B., Cleveland, Ohio—Three Stearns-Knight cars: one six-cylinder touring and one each four-cylinder touring and landaulet; one six-cylinder chassis.

Stevens-Duryea Co., Chicopee Falls, Mass.—Three six-cylinder Stevens-Duryea cars: one limousine and two touring; one chassis.

Studebaker Corp., Detroit, Mich.—Four Studebaker cars: Two four-cylinder touring and one sedan; one six-cylinder touring; one four-cylinder chassis.

Velie Motor Vehicle Co., East Moline, Ill.—Five four-cylinder Velie cars: Four touring cars and one roadster.

Waverley Co., Indianapolis, Ind.—Four Waverley electric broughams.*

Westcott Motor Car Co., Richmond, Ind.—Three Westcott cars: one each six-cylinder roadster and touring, one four-cylinder touring.

White Co., Cleveland, Ohio—Four White cars: two six-cylinder touring; one six-cylinder double limousine; one four-cylinder touring.

Willys-Overland Co., Toledo, Ohio—Four four-cylinder Overland cars: three touring cars and one roadster; one chassis.

Winton Motor Carriage Co., Cleveland, O.—Four six-cylinder Winton cars: two touring cars and one each roadster and double limousine.

Woods Motor Vehicle Co., Chicago, Ill.—Three Woods electric broughams; one chassis.*

Truck Guarantees in Book Form.

As a matter of convenience, the N. A. A. M. has arranged to have its recently adopted standard motor truck warranty lithographed and bound in board covers, after the manner of bank check books, with stubs to be filled in with truck numbers, dates, and so on. The name of the company issuing the guarantee will be lithographed at the head of the form. With a view to encouraging the use of the standard warranty, which limits the guarantee period to 90 days, truck manufacturers who are not members of the N. A. A. M. will be supplied with the books of forms. The price charged will be only sufficient to cover the cost of production and will be lower than an individual company could obtain for similar work. The form measures 12½ inches long, including the stub, and 7¼ inches wide, and is lithographed in banknote green on heavy, durable paper.

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MANY NEW ACCESSORIES CROP OUT IN CHICAGO

Despite the Shortened List, Fair Assortment of Wares Not Previously Displayed Come to Surface as Usual—Warner Gearset-Starter Appears Though Other Heralded Devices Do Not—The Several Other Novelties Disclosed

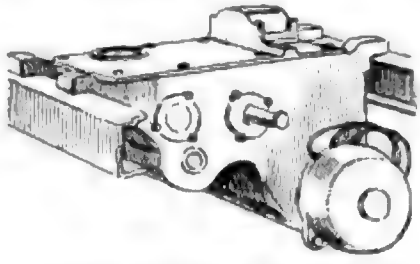
In the realm of motor starters, but little that is new and nothing that is startling turned up. The heralded combined lighting and starting systems of the Vesta Accumulator Co. did not put in an appearance, which is true also of the devices of the Briggs Magneto Co. and the Gould Storage Battery Co.

Warner Applies Starter to Gearset.

The promised starter of the Warner Mfg. Co., Toledo, Ohio, is in evidence, however, but, contrary to expectations, instead of being a motor starter, it is in reality a gearset incorporating the means of attachment of the starting unit of any of the well-known makes of electric starters now on the market. In its simplest aspect, the Warner device consists of a separate gear case formed as an integral part of the gearset case and in which are housed reduction gears and a ball clutch through which power to spin the motor is transmitted to the driving shaft. The starting motor, too, is adequately protected from the ingress of dirt or contact with articles calculated to work harm by a housing on the lower part of the gearset housing. The function of the ball clutch is to provide a flexible drive and, at the same time, to prevent injury to the starting motor in case of a backfire.

Rotary Air Motor in Thurber Starter.

The Thurber starter, made by the Thurber Rotary Starter Co., Detroit, Mich., is of the compressed air type, wherein air is compressed by a four-cylinder Kellogg pump driven from the motor and stored in a pressed steel tank against future use in starting the motor; the latter is accomplished through the intermediary of a rotary air motor which attaches directly to the motor crankshaft in place of the orthodox starting crank. The motor comprises a cylindrical body mounted eccentric with a casing in which it is free to rotate under the influence of air pressure exerted on a series of three vanes which radiate from it. The vanes are made slidable and are pressed against the walls of the casing by helical springs so that they always follow the contour of the cylinder walls and do not permit the leakage of the air. The air is admitted under a pressure of 200 pounds to the square inch at one end of the crescent-shaped chamber which is formed between the casing walls and the wall of the cylindrical rotor, and the pressure on the vane causes the rotor to revolve and bring the second and third vanes successively into play; exhaust is accomplished through a second port positioned at the other end of the crescent-shaped chamber. Naturally the rotor is attached to the crankshaft and causes rotation of the latter; an automatic clutch disengages the motor from the

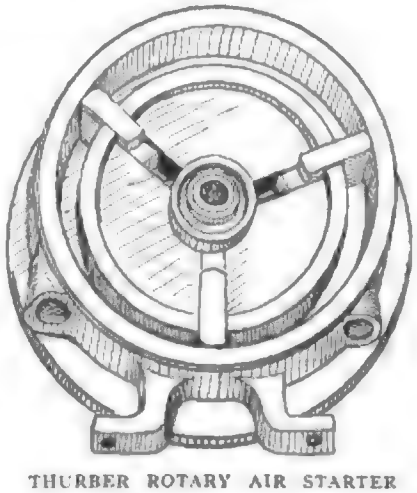


WARNER GEARSET AND STARTER

crankshaft when the engine takes up its cycle of operation.

Little Six in Continental Line.

At the exhibit of the well-known Continental Motor Mfg. Co. of Detroit a brand new "little six" cropped up. It is a Continental motor through and through, which leaves but little to be said. It is of the L-head type with enclosed valve mechanism, pump circulation of the cooling medium and force feed lubrication; bore and stroke are



THURBER ROTARY AIR STARTER

3¼ and 5¼ inches, and it is rated nominally at 34 horsepower, although at 1,500 revolutions a minute, 48 horsepower is developed. The motor is designed for three-point suspension and use in connection with a unit power plant assembly and, by way of increasing the scope of application, it can be supplied for any reasonable drop from the supporting arms to the center of the crankshaft. The crank case is so designed as to permit the use of any make of engine starter or magneto, and it may also be stated that the motor is adaptable for use on cars on which either left or right control obtains. Where the transmission also is supplied, the use of a three- or four-speed gearset is optional with the purchaser.

Steering Gear With Double Bearing.

Besides a full line of Buda motors, which they exhibited as a matter of course, Brandenburg & Co., Chicago, displayed for the first time a line of Universal steering gears, made in Racine, Wis., by the Universal Mfg. Co. Features of the gears are the long, triple-thread worm made of vanadium steel, case hardened; bearings are ground and the worm is pressed on the shaft over two flattened Woodruff nickel steel heat-treated keys, eliminating all chance of its working loose. Provision is made for taking up all play which is likely to develop in the worm by an eccentric bushing fitted to the bearing in the malleable iron worm housing. The worm wheel is treated in the same manner as the worm and is ground to a fit with the worm. Both the eccentric bearing and the plain bearing in the housing are made of hard bronze and accurately fitted. Frictional controls, with levers of malleable iron and gears die cast, are fitted.

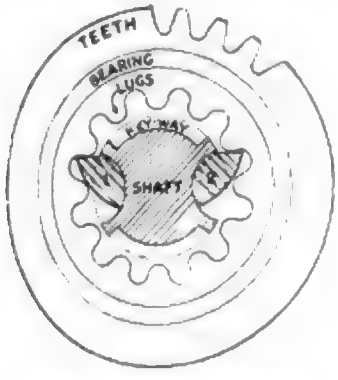
Wire Wheel With Wood Felloe Band.

Of the very many wire wheels which have made their appearance at the present shows probably none is more interesting than the one exhibited at the booth of T. J. Lindsay, Indianapolis, Ind. However unheard of, the Lindsay wheel is by no means a new product, for Lindsay made his first wire wheel way back in 1902, as is attested by one of the original wheels which is on exhibition.

The Lindsay wheel is novel, not in the mode of attachment to the axle, that is not over-far removed from the orthodox, nor in the mode of lacing, for the spokes correspond with the radii of the wheel, but in the construction of the rim itself. The rim comprises, first, a steel felloe band into which the spoke heads are countersunk; over this is placed a wood rim which, in turn, supports the steel band for the reception of the demountable rim. The construction, it is claimed, has many advantages in the way of eliminating moisture and cushioning the shocks.

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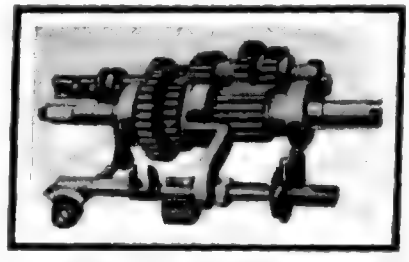
Of the several new things which came to the surface, none is newer or more radical than the Campbell gearset, exhibited by the Economy Equipping Co., of Chicago. The device is of the "gears-always-in-mesh" type and is innovative in that the use of dog clutches splined to the shaft is eliminated, their function being performed by "tilting keys"; the keys lie flush with the periphery of the shaft when the gears are not in driving engagement, but which can be so tilted as to contact with teeth cut internally on the gear wheel, causing rotation of the wheel in unison with the shaft at the proper time. The tilting of the keys is accomplished by means of a pair of helical springs after the keys have been shifted along the key seats and into position to engage the proper gear; the shifting is accomplished by means of a slotted collar and a yoke engaging with the change gear lever. The design permits of the entire mechanism being made very compact, and by virtue of the fact that the keys enter engagement with the internal lugs or teeth gradually, damage to either gearset, clutch or other part of the mechanism of the car is eliminated even when the gears are shifted without disengaging the clutch. By way of eliminating noise, one sliding gear is provided so that the lay shaft is caused to idle when high speed—direct drive—is in use.



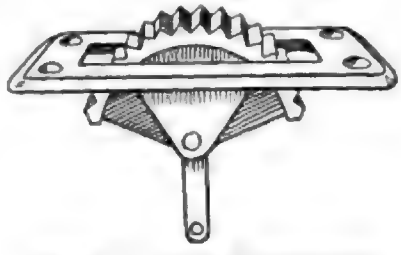
CAMPBELL TILTING KEYS

Another New Constant Mesh Gearset.

Also new in the transmission line is the three-speed selectively operated gearset produced by the Cotta Gear Mfg. Co., Rockford, Ill., itself a newcomer in the gearset manufacturing field and, just as the name of the new concern resembles the title of the older Rockford gearset maker—Cotta Transmission Co.—so does the product of the newcomer bear the earmarks of the older maker's product. In both instances the products are of the constant meshed gear type with power transmitted through the intermediary of dog clutches, which eliminates strain on the gear teeth and at the same time facilitates gear shifting. With the newer company's product springs have been eliminated from the assembly and double row ball bearings carry either end of both the driving and the lay shafts instead of the single row bearings which obtain in the Transmision Co.'s product; the latter, however, is provided with roller bearings on which the idler gears are mounted and which renders the product distinctive. Naturally, the newer product is put out for use in connection with either shaft or chain drive vehicles and also in unit power plant form, and is arranged so as to be adaptable for either right- or left-hand or center control.


CAMPBELL ALL-IN-MESH GEARSET

Just a glimpse is to be had of the exterior of the long-promised new carburetter of the Imperial Brass Mfg. Co., Chicago; it is mounted on a board, but all information concerning its "inner works" was politely refused, although the device has been in the course of development for some two years. Other new devices in the Imperial line, however, are not concealed under bushel baskets and but little search reveals the Imperial Wixon accelerator, which is designed to eliminate all possibility of accident in case the foot throttle should be inadvertently stepped on. It comprises simply a section of a toothed wheel, of which but a slight portion protrudes through a slot in the plate which serves for a bearing.


IMPERIAL WIXON ACCELERATOR

One new anti-skid device and a new mud hook are on view, made by the Perfection Non-Skid Climber Co., Edon, Ohio, and the Perkins-Campbell Co., Cincinnati, Ohio, respectively. The Non-Skid climber comprises a series of malleable iron pieces which stretch across the periphery of the tire in the same manner as the cross-chain members in an ordinary non-skid chain. The iron members are supported in position by side chains, to which they are attached by means of loops of heavy iron wire. Attachment and detachment are by means of a loose link in the outside chain; the device is made for both single and dual pneumatic tire equipment. The Perkins-Campbell mud hook comprises a malleable iron casing with a base piece formed to fit the curve of the tire, from which projects a short, corrugated baffle plate, which affords the gripping means. The device is strapped to the wheel by means of straps which pass through slots provided in the base; it is made in two sizes, to fit 4½-inch and 6-inch tires.

Exhibited for the first time, although it has been on the market for several months, is the Wotton automatic rectifier, made in Cleveland by the Electric Products Co. As its designation implies, the device is used in connection with the charging of electric vehicle batteries and, so used, eliminates the human factor from the operation, since the device, once started, consummates the charging operation without further attention.


PERFECTION CLIMBERS

In its simplest aspect, the device comprises an automatic cutout which serves to disconnect the battery from the charging circuit when the charging is complete, a regulator by means of which the charging rate can be varied within wide limits so as to permit of slow "soaking" or a very rapid charging, and an automatic regulator which cuts down the charging current as the battery approaches the charged state—a charging condition which is necessary when lead plate batteries are being dealt with. As for the rectifier itself—for the device is for use on alternating current—that is nothing more nor less than a mercury arc rectifier of compact design. Indeed, compactness is the keynote of the whole design, for the device, which is intended primarily for private garage use, measures but 18 by 20 inches and stands five feet high. Starting involves only the insertion of the charging plug and the throwing of a switch.

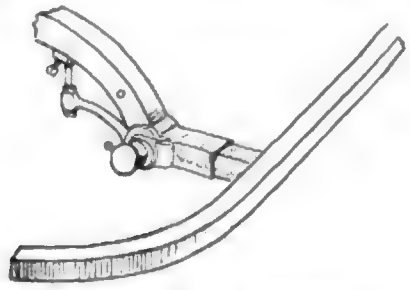
Variety in Bumper Styles.

In the realm of bumpers, two are exhibited which may be classed as new or un-

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usual, one by the L. P. Halladay Co., Streator, Ill., and the other by the Wm. E. Pratt Mfg. Co., of Chicago. The Halladay device comprises a very heavy bar of channel cross section—steel, of course. Attachment is by means of clamps drilled for the reception of the spring shackle bolts and a bolted-on clamp which attaches to the lower flange of the frame side member; this latter clamp is made adjustable by means of a set screw so that the bumper bar can be raised or lowered at will, the clamps pivoting around the shackle bolt. The springs are helical, of square cross section, and are enclosed in rectangular telescoping tubes to the elimination of moisture and dirt calculated to work a negative effect.

Radically different is the Pratt bumper, which comprises a round ba rsupported by two single-leaf "S" springs, the lower ends



NEW HALLADAY BUMPER

of which attach to the front ends of the frame members by means of screw clamps Obviously no shock, no matter how heavy, could possibly injure the bumper, for the spring simply would double up, so to speak, only to straighten out again when the depressing object was removed. Attachment involves the use of a monkey wrench only as a matter of but a few moments. The device is made either in malleable iron or in brass.

Bearings That Are Adjustable.

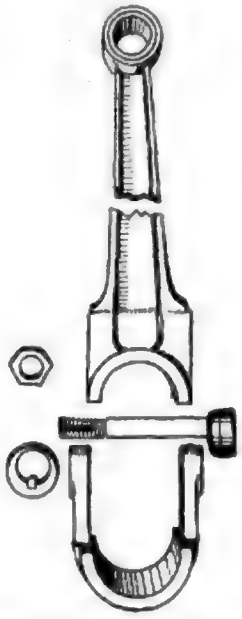
The U. S. Ball Bearing Mfg. Co., Oak Park, Ill., has on view a complete line of both single and double row ball bearings embracing the use of a new type of separator, permitting of the use of a sufficient number of balls to utilize 95 per cent. of the available ball space. The race ways as well as the retainers are made of Krefeld street, high in both carbon and chromium, and Hoffman balls are supplied.

Also new in the bearing line is the adjustable bearing of the Chicago Drop Forge & Foundry Co., which embraces the use of two brasses bolted together with a single bolt which passes through eccentric bushes. Turning the bushes accounts for all wear, and when the bolt is again tightened it locks both bushes and brasses, preserving the newer relation. The use of shims thus is eliminated.

A new combination comprising a lifting jack, a turntable, a tire rest and a transporting truck appeared in the Weaver Auto-Twin jack shown by the Weaver Mfg. Co., Springfield, Ill. The jack—in reality a pair of jacks operated together by the turning of a handle—is mounted on a three-cornered truck mounted on castors. Positioning the jack under the axle and turning the handle until the wheels are clear of the floor permits of the car being turned in a very short radius. The jack is made of the best of materials throughout.

Tool That Loosens Frozen Tires.

Another interesting contrivance which came to light is the Morris tire tool, shown by the Wm. E. Pratt Mfg. Co. In its simplest aspect the device is formed of a hook



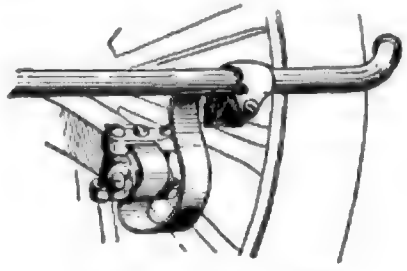
CHICAGO ADJUSTABLE BEARING

intended to clasp the wheel rim, a guide clamp and a lever adjustable with relation to the hook—that is, the hook is provided with a series of indentures, into any one of which the pin which forms the lever fulcrum can be placed so that the compass of the device includes all of the more common sizes of tires. In use, the tool is adjusted with the hook gripping the rim, and the lever operating on the tire bead; the guide piece eliminates slipping. It is claimed that the tool will quickly loosen tires, although frozen to the rim, and do so without injury to either the rim or to the tire. The device is made of malleable iron and is black enameled.

A suit case or package carrier of very simple design adds to the newness of the L. P. Halladay Co.'s display. The device comprises two upright arms, one of which is slidable on a horizontal arm cast integral with the other. Straps connect the tops of the two arms and provision is made by means of a screw clamp for fastening the carrier to the running board. The cases are placed between the arms of a pair of the brackets which are fastened to the board of the car and strapped firmly in place.

The Scarborough Co., an Indianapolis concern, is showing the Auto-Compact tent, which is designed to attach to the top of the car, the shape being preserved by guy ropes fastened to pegs driven in the ground. The tent is designed with a view toward rapid erection, and it is claimed that it is waterproof and by virtue of the canvas flooring that is provided, proof against the entrance of vermin. Folded, the tent complete measures but 7 by 20 inches.

Among the other unlisted exhibits was Herroline, which the maker, the Improved Gasolene & Oil Co., of Chicago, claims is nothing more than gasolene, but gasolene



PRATT SPRING BUMPER

which has, by virtue of exhaustive chemical treatment, acquired virtues with which the ordinary gasolene is not blessed. Added to the ordinary fuel in the proportion of three ounces to five gallons, it is claimed that the Herroline will increase the "going qualities" of the gasolene fully 50 per cent. without working negatively on the motor mechanism; besides which it is claimed the addition of Herroline to the gasolene eliminates danger in handling the fuel, since it renders the combination considerably less volitile than the untreated fuel, and at the same time it tends to reduce carbon deposit.

Wafers for Slipping Brakes.

Displayed along with other Rex products—polishes, soaps and leather dressing—the Armiger Chemical Co., a Chicago concern has a new product, anti-slip brake wafers. The wafers are composed of a hard belt dressing and when rubbed on the braking surface cause the brakes to grip despite their condition due to the presence of oil, grease or water. Naturally, the dressing is applicable to fan belts also, to cure similar evils.

In the leather goods line, a new driving gauntlet is exhibited by the Morrison-Ricker Co., maker of Grinnell gloves. By virtue of a special stitching across the

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palm, a series of serrations or corrugations is produced which it is claimed go far toward eliminating slipping of the wheel under the grasp.

The Perkins-Campbell Co., Cincinnati, Ohio, has on view a leather spark plug case for the accommodation of six plugs, which is sufficiently solid for the protection of the plugs from injury and yet sufficiently flexible to preclude all chance of cracking. Naturally, leather that is absolutely waterproof enters into the construction. Straps for all purposes and a complete line of leather covers for magnetos also are included in the exhibit.

THE 177 ACCESSORY DEALERS AND WHAT THEY DISPLAY

* Denotes not shown in New York; † denotes will remain second week.

A. S. K. Co., Cincinnati, Ohio—Polishes.*

Ajax-Grieb Rubber Co., New York City—Ajax tires.†

American Ball Bearing Co., Cleveland, Ohio—American axles and worm gearing.†

American Bronze Co., Berwyn, Pa.—Non-Gran bearing metal.†

Armiger Chemical Co., Chicago, Ill.—Polishes.*

Arnold, N. B., Brooklyn, N. Y.—Slikup cleaning specialties.

Auto Parts Co., Chicago, Ill.—Parts.*†

Auto Parts Mfg. Co., Muncie, Ind.—B-T-K gearsets, clutches, steering gears and levers.

Automatic Motor and Engineering Co., Chicago, Ill.—Church pneumatic system.*†

Automobile Supply Mfg. Co., Brooklyn, N. Y.—Newtone, Electra and Rubes horns.

Badger Brass Mfg. Co., Kenosha, Wis.—Solar lamps.†

Baldwin Chain & Mfg. Co., Worcester, Mass.—Baldwin chains.†

Baldwin Steel Co., New York City—Baldwin steels.†

Barco Brass & Joint Co., Chicago, Ill.—Exhaust horns, cut-out valves, pedals.*

Batavia Rubber Co., Batavia, N. Y.—Batavia tires.

Berg Auto Trunk & Specialty Co., New York City—Berg trunks and carriers.

Blackledge Mfg. Co., John W., Chicago, Ill.—Velvet auxiliary springs.

Bower Roller Bearing Co., Detroit, Mich.—Bower roller bearings.†

Bowser & Co., S. F., Fort Wayne, Ind.—Fuel pump and storage systems.†

Brandenburg & Co., Chicago, Ill.—Buda motors and Universal steering gears.*

Breakstone, S., Chicago, Ill.—Watch Dog lever locks and Hopewell tire cases.*

Briggs Magneto Co., Elkhart, Ind.—Briggs magnetos, lighting and starting systems.†

Brown Co., Syracuse, N. Y.—B'Co. pumps and specialties.

Brown-Lipe Gear Co., Syracuse, N. Y.—Brown-Lipe gears and gearsets.†

Byrne, Kingston & Co., Kokomo, Ind.—Kingston carburetters.†

B. & L. Auto Lamp Co., New York City—B. & L. lamps and fittings.

Champion Ignition Co., Flint, Mich.—A-C spark plugs.†

Chicago Drop Forge & Foundry Co., Chicago, Ill.—Drop forgings.†

Coes Wrench Co., Worcester, Mass.—Wrenches.

Connecticut Telephone & Electric Co., Meriden, Conn.—Connecticut shock absorbers, magnetos and ignition devices.

Continental Motor Mfg. Co., Muskegon, Mich.—Continental motors.*†

Cook's Sons, Adam, New York City—Albany grease and lubricating oils.

Cotta Gear Co., Rockford, Ill.—Cotta transmissions.*

Cotta Transmission Co., Rockford, Ill.—Gearsets.†

Cowles & Co., C., New Haven, Conn.—Lamps, heaters and body fittings.

Cramp & Sons Ship & Engine Bldg. Co., Wm., Philadelphia, Pa.—Parsons's white brass and bronze bearing metals, bearings and worm gears.†

Dayton Rubber Mfg. Co., Dayton, Ohio—Dayton airless tires.

Daniels, Smalley, Detroit, Mich.—New Era tires, tubes, springs and Mitchell metal parts and Sly accessories.

Dean Electric Co., Elyria, Ohio—Tuto and Rexo signals, Dynalux electric lighting systems, Otho and Elyria-Dean electric lighting and starting systems, Elyria-Dean speedometers, Hi-Fre-Co ignition systems.

Detroit, Lubricator Co., Detroit, Mich.—Lubricators.*

Detroit Electrical Appliance Co., Detroit, Mich.—Deaco electric lighting systems.

Diamond Chain & Mfg. Co., Indianapolis, Ind.—Diamond chains.†

Diamond Rubber Co., Akron, Ohio—Diamond tires.†

Dixon Crucible Co., Jos., Jersey City, N. J.—Graphite lubricants.†

Doehler Die Casting Co., Brooklyn, N. Y.—Die cast parts.

Double Fabric Tire, Co., Auburn, Ind.—Tires and inner tubes.

Dykes Co., John L., Chicago, Ill.—Tire protectors.

E-C Sales Co., Chicago, Ill.—Axles, demountable wheels, tire holders, etc.*

Eavenson Sons, Inc., J., Camden, N. J.—Jesco soaps and polishes.

Economy Equipping Co., Chicago, Ill.—Campbell gearsets.*†

Edelmann & Co., E., Chicago, Ill.—Tire gauges, valves, etc.

Edison Storage Battery Co., West Orange, N. J.—Edison batteries.*†

Electric Auto Lite Co., Toledo, Ohio—Auto-Liter lighting and starting systems.

Electric Products Co., Chicago, Ill.—Wotton automatic rectifiers.*

Empire Tire Co., Trenton, N. J.—Empire tires.†

Edmunds & Jones Mfg. Co., Detroit, Mich.—Lamps.†

Endurance Tire & Rubber Co., New York City—Endurance red inner tubes.

Electric Storage Battery Co., Philadelphia, Pa.—Exide storage batteries.†

Esterline Co., Lafayette, Ind.—Berdon electric lighting and starting system.†

Federal Rubber Mfg. Co., Milwaukee, Wis.—Federal tires.

Findeisen & Kropf Mfg. Co., Chicago, Ill.—Rayfield carburetters.†

Firestone Tire & Rubber Co., Akron, Ohio—Firestone tires.†

Fisk Rubber Co., Chicopee Falls, Mass.—Fisk tires.†

Gabriel Horn Mfg. Co., Cleveland, Ohio—Gabriel horns and rebound snubbers.†

Garage Equipment Mfg. Co., Milwaukee, Wis.—Hercules and Simplex pumpers and tire holders. Electrabola lamps and Gemco specialties.†

Gemmer Mfg. Co. ,Detroit, Mich.—Gemmer steering gears.†

Gibney Rubber Co., J. L., Philadelphia, Pa.—Tires and vulcanizers.†

Globe Machine & Stamping Co., Cleveland, Ohio—Steel tool boxes, metal hampers, fenders and sheet metal parts.†

Goodrich Co., B. F., Akron, Ohio—Goodrich tires.†

Goodyear Tire & Rubber Co., Akron, Ohio—Goodyear tires.†

Gould Storage Battery Co., New York City—Gould batteries and Duplex lighting and ignition systems.†

Grant-Lees Mch. Co., Cleveland, Ohio—Gearsets.

Gray & Davis, Amesbury, Mass.—Lamps and electric starting and lighting systems.†

Ham Mfg. Co., C. T., Rochester, N. Y.—Lamps.*

Halladay Co., L. P., Streator, Ill.—Bumpers, levers, pedals, tire carriers, license brackets, etc.

Harrow Spring Co., Kalamazoo, Mich.—Springs.*

Harris Oil Co., A. W., Providence, R. I.—Lubricants.†

Hartford Suspension Co., Jersey City, N. J.—Truffault-Hartford shock absorbers, Hartford electric starting and lighting systems and jacks and bumpers.†

Havoline Oil Co., New York City—Havoline lubricants.†

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Hayes Mfg. Co., Detroit, Mich.—Metal bodies, tool boxes, running boards and sheet metal parts.

Hess Spring & Axle Co., Carthage, Ohio—Springs and axles.†

Heinze Electric Co., Lowell, Mass.—Magnetos and coils.†

Hoffecker Co., Boston, Mass.—Hoffecker Steady Hand speedometers.

Homo Co. of America, Philadelphia, Pa.—Homo carburetters.†

Hyatt Roller Bearing Co., Newark, N. J.—Hyatt flexible spiral steel roller bearings.†

Ignition Starter Co., Detroit, Mich.—Disco acetylene and electric starting and lighting systems.†

Illinois Tire Filler Co., Chicago, Ill.—Tire filler.*

Imperial Brass Mfg. Co., Chicago, Ill.—Carburetters and brass parts.*†

Improved Gasolene & Oil Co., Chicago, Ill.—Herroline gasolene improver.*

International Acheson Graphite Co., Niagara Falls, N. Y.—Oildag and Gredag lubricants.

International Metal Polish Co., New York City—Blue ribbon polishes.

J-M Shock Absorber Co., Philadelphia, Pa.—J-M shock absorbers.

Kelly-Springfield Tire Co., New York City—Kelly-Springfield tires.

Kent Mfg. Works, Atwater, Philadelphia, Pa.—Unisparker ignition systems and Monoplex horns.†

Kellogg Mfg. Co., Rochester, N. Y.—Hand and power pumps and air engine starters.

Kokomo Electric Co., Kokomo, Ind.—Kingston magnetos, coils and timers.†

K-W Ignition Co., Cleveland, Ohio—K-W magnetos and coils.

Leather Tire Goods Co., Niagara Falls, N. Y.—Woodworth tire treads, Kant Skid tire bands, repair boots, etc.

Lee Tire & Rubber Co., Conshohocken, Pa.—Lee and Leland tires and Waymaker exhaust horns.

Lefever Arms Co., Syracuse, N. Y.—Gearsets.†

Lindsay, T. J., Indianapolis, Ind.—Rear axles and wire wheels.*

Link Belt Co., Philadelphia, Pa.—Silent chains.†

Longdin-Brugger Co., Fond du Lac, Wis.—Tops.*

Lovell-McConnell Mfg. Co., Newark, N. J.—Klaxon horns, Conover safeguards.

Lycoming Foundry & Mch. Co., Williamsport, Pa.—Lycoming-Mead motors.

Marathon Tire & Rubber Co., Cuyahoga Falls, Ohio—Marathon tires.

Marburg Bros., Inc., New York City—Mea magnetos, S. R. O. bearings.†

Mayo Mfg. Co., Chicago, Ill.—Pumps and gauges.

McCord Mfg. Co., Detroit, Mich.—Radiators, lubricators, fans and McKim gaskets.†

McCue Co., Buffalo, N. Y.—McCue axles and wire wheels.

Metal Stamping Co., Long Island City, N. Y.—Stampings.

FOUR UNUSUAL ACCESSORIES



PERKINS-CAMPBELL MUD HOOK

HALLADAY SUIT CASE CARRIER

AUTO-TWIN LIFTING JACK

MORRIS TIRE TOOL

Michelin Tire Co., Milltown, N. J.—Michelin tires.*

Model Gas Engine Works, Peru, Ind.—Model motors.†

Morrison-Ricker Mfg. Co., Grinnell, Ia.—Grinnell gloves.*

Mossberg, Frank, Attleboro, Mass.—Wrenches.

Motsinger Devices Mfg. Co., Pendleton, Ind.—Motsinger autosparkers and carburetters.†

Motometer Co., New York City—Motometer temperature indicators.

Motz Tire & Rubber Co., Akron, Ohio—Motz cushion tires.†

Muncie Gear Works, Muncie, Ind.—Gears, wheels and gearsets.†

National Coil Co., Lansing, Mich.—Spark coils.†

National Motor Supply Co., Cleveland, Ohio—National pumps and vulcanizers.

National Rubber Co., St. Louis, Mo.—Tire preservative and Kantleak fillers.

National Tube Co., Pittsburg, Pa.—Seamless steel tubing.†

New Jersey Car Spring & Rubber Co., Jersey City, N. J.—Carspring tires.

New Miller Carburetter Co., Indianapolis, Ind.—New Miller carburetters.†

New York & New Jersey Lubricants Co., New York City—Columbia lubricants.

New York Coil Co., New York City—Rhodes Union Spark systems and other ignition devices.

North East Electric Co., Rochester, N. Y.—North East electric lighting and starting systems.†

Northway Motor & Mfg. Co., Detroit, Mich.—Northway motors.†

Oliver Mfg. Co., Chicago, Ill.—Oliver and Sampson jacks.*†

Pantasote Co., New York City—Pantasote top and seat coverings.†

Peacock Co., Clarence H., New York City—Ames shock absorbers.

Pennsylvania Rubber Co., Jeannette, Pa.—Pennsylvania tires.†

Perkins-Campbell Co., Cincinnati, Ohio—Straps and license brackets, magneto covers and spark plug cases.*

Perfection Spring Co., Cleveland, Ohio—Krupp steel springs.†

Perfection Non-Skid Climber Co., Edon, Ohio—Anti-skid devices.*

Pittsfield Coil Co., Pittsfield, Mass.—Pittsfield magnetos, coils, etc.*†

Piel Co., G., Long Island City, N. Y.—Long horns and G-P muffler cut-outs.

Pratt Mfg. Co., Wm. E., Chicago, Ill.—Jackson bumpers and other parts.*†

Racine Mfg. Co., Racine, Wis.—Bodies.*

Racine Rubber Co., Racine, Wis.—Racine tires.*

Randall-Faichney Co., Boston, Mass.—Jericho and Jubilee exhaust horns, muffler cut-outs, B'Line grease guns, Jericho gas regulators, and other accessories.

Remy Electric Co., Anderson, Ind.—Remy magnetos, lighting and starting systems.†

Republic Rubber Co., Youngstown, Ohio—Republic tires.†

Rhineland Machine Works Co., New York City—Rhineland bearings.†

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Rich Tool Co., Chicago, Ill.—Tools and Tungsten valves.

Ross Gear & Tool Co., Lafayette, Ind.—Steering gears, differentials and other Tools.†

Royal Equipment Co., Bridgeport, Conn.—Duplex and Raymond brakes, Raybestos brake linings, Gyrex mixers.†

Rutenber Motor Co., Marion, Ind.—Rutenber motors.*†

Sager Co., J. H., Rochester, N. Y.—Sager bumpers and supplementary springs.

Scarborough Co., Indianapoils, Ind.—Tents.*

Spicer Mfg. Co., Plainfield, N. J.—Spicer universal joints.†

Splitdorf Electrical Co., Newark, N. J.—Splitdorf magnetos, coils, plugs and other ignition devices, also electric lighting system.†

Standard Roller Bearing Co., Philadelphia, Pa.—Standard ball and roller bearings.†

Standard Welding Co., Cleveland, Ohio—Stanweld rims, electrically welded tubing and parts.†

Standard Thermometer Co., Boston, Mass.—Standard speedometers and Abell tire pumps.



SETTEE THAT SERVED A DOUBLE PURPOSE IN THE STANDARD WELDING CO.'S BOOTH—FORMED WHOLLY OF STANDARD WELDING PRODUCTS

Sarco Engineering Co., New York City—Coventry chains.†

Schoen-Jackson Co., Media, Pa.—Feps carburetters and flexible metal hose.

Schrader's Sons, Inc., A., New York City—Universal Tire valves and pressure gauges.†

Seamless Rubber Co., New Haven, Conn.—Seamless tires and inner tubes.

Shaler Co., C. A., Waupun, Wis.—Shaler vulcanizers.

Sheldon Axle Co., Wilkes-Barre, Pa.—Axles and springs.†

Simms Magneto Co., New York City—Simms magnetos and S. U. carburetters.

S. K. F. Ball Bearing Co., New York City—S. K. F. ball bearings.

Smith Co., A. O., Milwaukee, Wis.—Parts.†

Sparks-Withington Co., Jackson, Mich.—Fans and Sparton horns.

Stewart & Clark Mfg. Co., Chicago, Ill.—Stewart speedometers.†

Stromberg Motor Devices Co., Chicago, Ill.—Stromberg carburetters.†

Swinehart Tire & Rubber Co., Akron, Ohio—Swinehart tires.†

Texas Co., New York City—Lubricants.†

Thermoid Rubber Co., Trenton, N. J.—Thermoid tires.

Thurber Rotary Starter Co., Detroit, Mich.—Engine starters.*

Timken-Detroit Axle Co., Detroit, Mich.—Timken hollow cast steel wheels and bevel and worm axles.†

Timken Roller Bearing Co., Canton, Ohio—Timken taper roller bearings.†

Tingley & Co., C. O., Rahway, N. J.—Vulcanizing outfits.

Tobey, Wm. L., Boston, Mass.—Q. D. rim removers and glare removers.

U. S. Ball Bearing Mfg. Co., Oak Park, Ill.—U. S. Ball Bearings.*

United States Light & Heating Co., New York City—U. S. L. starting and lighting systems and storage batteries.†

United States Tire Co., New York City—United States tires.

Universal Tire Protector Co., Angola, Ind.—Tire protectors.*

Vacuum Oil Co., New York City—Mobiloils and greases.†

Vail-Osgood Rubber Products Co., Chicago, Ill.—Scientific inner tubes.*

Valentine & Co., New York City—Varnishes.

Vanguard Mfg. Co., Joliet, Ill.—Windshields.*

Veeder Mfg. Co., Hartford, Conn.—Veeder tachometers, odometers and die cast parts.†

Vesta Accumulator Co., Chicago, Ill.—Vesta storage batteries and lighting systems.†

Voorhees Rubber Mfg. Co., Jersey City, N. J.—Brown Scientific inner tubes.

V-Ray Co., Chicago, Ill.—V-Ray plugs.

Wallman Mfg. Co., Milwaukee, Wis.—Oil tanks and storage systems.*†

Walpole Rubber Co., Boston, Mass.—Walpole tires.

Waukesha Motor Co., Waukesha, Wis.—Waukesha motors.*†

Warner Gear Co., Muncie, Ind.—Gears and parts and Gardner engine starters.†

Warner Mfg. Co., Toledo, Ohio—Gearsets and engine starters.†

Warner Instrument Co., Beloit, Wis.—Warner autometers.†

Wasson Piston Ring Co., Hoboken, N. J.—Wasson piston rings.

Weaver Mfg. Co., Springfield, Ill.—Auto-Twin jacks.*

Weed Chain Tire Grip Co., New York City—Weed chains.†

Weston-Mott Co., Flint, Mich.—Axles and parts.†

Westinghouse Electric & Mfg. Co., Pittsburg, Pa.—Motors, starting and lighting outfits, vulcanizers, horns, etc.†

Wheeler & Schebler, Indianapolis, Ind.—Schebler carburetters.†

Whitney Mfg. Co., Hartford, Conn.—Whitney chains.†

Willard Storage Battery Co., Cleveland, Ohio—LBA storage batteries.†

Williams Co., J. H., Brooklyn, N. Y.—Drop forgings and wrenches.†

Wolverine Lubricants Co., New York City—Wolverine lubricants.

Bergdoll Opens Boston Branch.

The Bergdoll Motor Car Co. of Philadelphia, Pa., has opened a branch in Boston at 171 Huntington avenue. It is in charge of Clifton C. Edwards, who has been identified with the New England trade for nearly ten years.

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MONTREAL'S SECOND SHOW INCLUDES COMMERCIAL CARS

Drill Hall Overcrowded With the Exhibits of Forty-three Dealers—Accessory Exhibits Numerous.

Automobile shows "take" well in Montreal—that is, if the fact that two have been staged—independently, of course—in the Drill Hall within the short course of a month can be taken as a criterion. The last one, which was under the auspices of R. M. Jaffray, closed its doors on Saturday evening last, February 1st, having held sway for a full week. In contradistinction to the first show, which under the auspices of the Automobile Club of Canada occupied the building from January 4th to 11th, trucks also were exhibited at the second show. In all, there were 43 exhibitors of either vehicles or products which have to do with them.

The exhibitors were: Automobile Francaises, Albion Motor Car Co., Ltd., Arlington Bicycle Works, Brantford Motor Truck Co., J. B. Baillargeon, Baker Motor Vehicle Co., Bellerive Garage & Auto Co., A. Beaudry, J. C. Collette, Canadian Automatic Transfer Co., Canadian Motor & Supplies Co., Canadian Pneumatic Tool Co., J. P. Mitchell Co., Ltd., Canadian Fairbanks-Morse Co., Ltd., Chapman Double Ball Bearing Co., Ltd., Canadian Tire Filler Co., Canadian Tire Filler Co., De Vaux Motor Co., Drednot Motor Works Co., Ltd., Franco-American Automobile Co., Frigon & Baker, Gareau Motor Car Co., International Harvester Co., Paul Lair, Victor Levesque, La Cie de Laiterie St. Laurient, E. Major, Maratime Motor Car Co., Ltd., Motors Transport, Ltd., Nicole, Nicolson & Co., Norwalk Motor Car Co., Wm. J. O'Leary, Arthur Pelletier, R. E. T. Pringle, Pope-Hartford Motor Co., Paige Motor Car Sales Co., P. A. D. Robert, Royal Automobile Co., Fred E. Ritchie, E. Rivet, Republic Motor Car Co., Rosseau Bros., Ltd., Stockwell Motor Co., Solomon & Spielman, Universal Electric Economy Co., Weed Chain Tire Grip Co.

Thirty-five Dealers Display at Scranton.

Thirty-five dealers who displayed 39 different makes of automobiles in the evergreen and vari-colored bunting bedecked drill hall of the Scranton Armory comprised the third annual show of the Scranton Automobile Board of Trade, which held forth in the Pennsylvania city until Saturday last, February 1st; the doors opened on the exhibit Monday evening, January 27th. As is the case with many of the smaller shows, accessory dealers were not over-abundant, but motorcycle dealers were very much in evidence. The cars exhibited were:

Hudson, Studebaker, Cadillac, Maxwell, Hupmobile, Ford, Standard Electricque, Locomobile, Stevens-Duryea, Overland, Chase, Rambler, Stanley, Jackson, Mack truck, Franklin, Winton, Buick, Alco, Krit, Apperson, Haynes, Bowman, Kitsee, Pierce-Arrow, Autocar, Palmer-Singer, Little, Abbott-Detroit, Pope-Hartford, Marion, Cole, Chalmers, Packard, Oakland, White, Paige-Detroit, Michigan and Mercer.

Three Buildings for Rochester's Show.

Three buildings—all situated in Exposition Park and inter-connected—were necessary to house Rochester's fifth annual show, which closed its doors Saturday evening last, February 1st, having been in full swing since the evening of the Monday preceding. And despite the number and the size of the buildings there was scarcely floor space enough properly to care for the 112 exhibitors, 40 of whom displayed vehicles of one make or another, there being 60 different makes on the floor, and the other 72, accessories. As has been the case in other years, the show was under the management of the Rochester Automobile Dealers' Association.

Decorations were simple but effective, gold and blue being the colors which predominated in the draperies. Festoons of electric lights, the supports entwined with vari-colored streamers and studded with pennants, added greatly to the general effect.

Now, a "Jumping Contest" for Cyclecars.

Not satisfied with ordinary contests, foreign motorists—if the term may be applied to those who drive that peculiar type of vehicle styled "cyclecar"—have arranged a jumping contest to take place in the near future. The diminutive cars will be raced at a hump-backed bridge in an effort to better the record of a Frenchman who is credited with having jumped no less than 32 feet astride a motorcycle. Just what the contest will prove has not as yet, been explained.

Would Force Garages to Keep Records.

In an effort to prevent "joy riding" and to assist the recovery of stolen cars, Assemblyman Salus has introduced a bill into the New Jersey legislature which seeks to require garage owners to keep a record of the arrival and departure of all cars which enter their establishments, the records to be open for public inspection at all times. If enacted, violation of the law will be attended by a fine of $50.

TAFT STARTS CEREMONIES AT WASHINGTON SHOW

Presses the Button Which Throws Light Upon the 28 Cars Shown by 17 Dealers—Decorative Scheme Is Simple.

If an auspicious opening can bring success to an automobile show, then the exhibit which is holding the boards in Washington certainly should be successful, for it was opened by President Taft himself. Owing to a previous engagement, the President could not actually be present, but from the White House promptly at 8 o'clock Monday evening last, 3d inst., he sent the flash which caused the massive American flag to unfurl from the lofty ceiling of the Convention Hall and which at the same time set aglow the more than 1,500 electric lights which play no little part in the decorative scheme. The exhibition is staged by the Washington Automobile Dealers' Association.

In the matter of decorations, ivory, white, gold and green form the color scheme, and ceiling and walls are garbed in bunting and streamers so tinted. Booths are marked off with corner posts bearing electroliers and entwined with smilax and poinsettia; gold rope connects posts. The exhibits of the 17 motor car dealers who are showing embrace 28 different makes of both pleasure and commercial cars; accessories are shown by a dozen dealers.

The exhibitors are: Knox Motor Co., Knox and Winton; White Automobile Co., White and Universal and G. M. C. trucks; A. Loffler Co., Speedwell, Regal, Commerce, Lippard-Stewart truck; John H. Earle Co., Oakland; Norwalk Motor Car Co., Norwalk; Miller Co., Stutz; G. R. Cowie Co., Cole; Locomobile Co. of America, Locomobile; Emerson & Orme, Apperson and Detroit electric; Michigan Motor Co., Michigan; Henderson-Rowe Auto Co., Chevrolet, Little and Pullman; Potomac Motor Car Co., Marmon, and Woods electric; Matheson Motor Co., Premier and Henderson; Washington Auto Service Co., Hupmobile; Berryman & Williams, Pathfinder; Frederick Newburgh, Moon; Congressional Garage, Wilcox trucks.

English Humor Applied to Lamps.

In the production of powerful head lamps—or can it be powerful humor?—American makers have nothing on their British cousins. "Two H. P. lamps" is the way one British car manufacturer lists an "extra" in his catalog. But the H. P. stands neither for high pressure, nor hocus pocus, nor just plain horsepower; it stands for high power!

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THE TRUCKS THAT WILL BE "CATHEDRALIZED"

Chicago's Show of Commercial Vehicles Promises to Accentuate Standardization Revealed in New York—Score of Trucks Reserved for Display in West—Increase in the Light Weight Ranks.

All that the motor truck people of New York are wishing the motor truck people of Chicago is that the automobile show, Part II—which, being interpreted, means the commercial vehicle show—may be no less satisfactory than the recent week-long function that divided itself up between Good Old Madison Square Garden and the—well, young and more majestic Grand Central Palace. And behind the wish is the lurking suspicion that there's not likely to be anything the matter with the Chicago truck show, thank you, if for no other reason than that about all of the big Eastern exhibits will be there, bag and baggage, as well as a score that did not deign to cast their shadows on the soil of the Skyscraper City.

Business That Follows Pleasure.

Of course, this is in line with Chicago's propensity for doing things on a large scale. Incidentally, it would be highly unorthodox to permit the present occasion to slip into the shadows of the past without making some reference to the aforesaid propensity; so be it chronicled that, though there were no swattable insects on New York's truck show, the city of strenuous zephyrs will make a better showing by five exhibits, for while there were 64 in New York there will be 69 in Chicago, including the 20 that did not come out of the West to New York.

On Monday, February 10, when all the pleasure exhibits have been cleared away, and the "working classes" have settled solidly into their places, the various and multifarious doors of the Coliseum, the Coliseum Annex, the Wilson Building—which is about as big as the Annex and is made practically part of it, for the time being, by means of a covered passage—and the First Regiment Armory will be thrown open—no one ever heard of doors being opened in any way except by being "thrown"—and will keep on opening and closing more or less continuously until the following Saturday.

Chicago's Score of "Exclusives."

Of the 20 exhibitors who were not at the New York show, the majority will display machines that partake of the general tendency toward standardization, while the exceptions are for the most part familiar types that have "made good" on the road. The Diamond T people, whose line embraces machines ranging in capacity from 1½ to 5 tons, have brought out their smallest machine with a worm drive. The advantages accruing from the application of power to all four wheels are strongly and practically urged by the Four-Wheel Drive company, whose machines have been put through that test of tests—the army maneuvers—and emerged covered with mud and glory. A new offering made by an old consern is the Urban electric, built by the Kentucky Wagon Co., along the most approved lines and ready, notwithstanding its newness, to roll right into service with the best of them. Just what will be the features of the Buffalo electric exhibit is a matter that has not yet been elucidated, and it remains for the opening of the show to make the revelation—a condition of affairs that adds interest by arousing curiosity and expectation. Still another electric, and one that is built along unusual lines, is the Walker, the internal driving system of which is by no means unfamiliar and is not changed in any material respect.

TRUCKS TO BE EXHIBITED IN CHICAGO, FEBRUARY 10-15

Not Exhibited in New York.

Adams	Mogul
Avery	Mercury
Buffalo Elec	Natco
Clark	Old Reliable
Commerce	Poyer
Diamond T	Reliance
Four Wheel Drive	United States
Harder	Urban
Ideal	Walker Electric
Little Giant	Ware

Exhibited in New York.

Alco	Lippard-Stewart
Autocar	Locomobile
Baker	Lansden Elec
Bessemer	Mack
Blair	Mais
Brown	Modern
Chase	Packard
Dart	Peerless
Federal	Pierce-Arrow
Flint	Pope-Hartford
Garford	Reo
G. M. C.	Sanford
General Vehicle	Saurer
Gramm	Schacht
B. A. Gramm	Selden
Hewitt	Service
Hupp	Smith-Milwaukee
Indiana	Speedwell
I. H. C.	Standard
Kelly-Springfield	Sternberg
Kissel	Stewart
Knox	Studebaker
Koehler	Universal
Krebs	Velie
Lauth-Juergens	Waverley Elec
	White

Little Fellows and Big Ones.

The Chicago "exclusives" include a number of makers who confine their attention to machines of the smaller types, from two tons capacity downward. The Adams, the Clark, the Ideal, the Natco—all are machines of popular sizes, built along more or less standard lines, each, however, with individual features and details that go far in helping a prospective purchaser to make up his mind. Among the light machines that are more or less different in general design from conventional types are the Commerce, which has friction drive, and the Little Giant and Mercury, which possess the simplicity that goes with the employment of a horizontal motor with two opposed cylinders. Among the big ones, ranging up to five and six tons, are the Avery, Harder, Old Reliable, Reliance, U. S., and Mogul—the latter, however, the only one of the "exclusives" to pass the five-ton mark and build a six-ton truck. The Poyer and Ware complete the list of a score of machines that for the most part are more or less familiar.

"Queer Things" Conspicuously Absent.

With the practical transplantation of the New York show to Chicago, it goes without saying that the main characteristics of the two exhibitions will be alike. The strides that have been made in the elimination of undesirable and impracticable methods of construction and the adoption of features that have survived the trials of time and service—in other words, standardization of design—will be as evident in one place as the other, and the absence of the queer things for which the Chicago show used to be more or less famous—which wasn't the fault of anyone except those who concocted the freaks— will be regretted by no one except perhaps some who look in out of idle curiosity, and they don't count much at an exhibition of commercial vehicles.

Summary of Trucks To Be Exhibited.

Adams Bros., Findlay, Ohio. Adams. Gasolene, 1 and 1½ tons; prices, $2,100 and $2,300.*

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American Locomotive Co., New York. Alco. Gasolene, 2 to 6½ tons; prices, $2,950 to $5,200.

Autocar Co., Ardmore, Pa. Autocar. Gasolene, 3,000 pounds; price, $2,150.

Avery Co., Peoria, Ill. Avery. Gasolene, 2, 3 and 5 tons; prices, $2,700 to $4,500.*††

Baker Motor Vehicle Co., Cleveland, Ohio. Baker. Electric, 500 pounds to 4 tons; prices, $1,800 to $3,500.††

Bessemer Motor Truck Co., Grove City, Pa. Bessemer. Gasolene, 1,000 to 3,000 pounds; prices, $1,200 to $2,700.††

Blair Mfg. Co., Newark, N. J. Blair. Gasolene, 1½ to 3½ tons; prices, $3,000 to $3,750.†

Bowling Green Motor Car Co., Bowling Green, Ohio. Modern. Gasolene, 1,000 to 2,000 pounds; prices, $1,200 to $1,600.†

Brown Commercial Car Co., Peru, Ind. Brown. Gasolene, 500 pounds; price, $1,650.††

Buffalo Electric Vehicle Co., Buffalo, N. Y. Buffalo. Electric.*

Chase Motor Truck Co., Syracuse, N. Y. Chase. Gasolene, 500 pounds to 2 tons; prices, $500 to $2,200.†

Clark Delivery Car Co., Chicago, Ill. Clark. Gasolene, 1 ton; price, $2,000.*

Chicago Pneumatic Tool Co., Chicago, Ill. Little Giant. Gasolene, 1 ton; price, $1,100.*††

Commerce Motor Car Co., Detroit, Mich. Commerce. Gasolene, 1,000 pounds; price, $700.*††

Dart Mfg. Co., Waterloo, Ia. Dart. Gasolene, 750 to 3,000 pounds; prices, $750 to $1,790.†

Diamond T Motor Car Co., Chicago, Ill. Diamond T. Gasolene, 1½, 3 and 5 tons; prices, from $2,250 to $3,500.*†

Dayton Auto Truck Co., Dayton, Ohio. Dayton. Gasolene, 2, 3 and 5 tons; prices, $2,600 to $4,500.*

Durant Dort Carriage Co., Flint, Mich. Flint. Gasolene, 1,000 and 1,600 pounds; price of 1,0000 pound, $875.

Federal Motor Truck Co., Detroit, Mich. Federal. Gasolene, 1 ton; price, $1,800.

Four Wheel Drive Auto Co., Clintonville, Wis. Gasolene.*††

Garford Co., Elyria, Ohio. Garford. Gasolene, 1½ to 5 tons.

General Motors Truck Co., Pontiac, Mich. G M C. Electric and gasolene, electric 1,000 pounds to 6 tons and gasolene 1¼ to 5 tons.

General Vehicle Co., Long Island City, N. Y. General Vehicle. Electric, 750 pounds to 5 tons. ††

Gramm Motor Truck Co., Lima, Ohio. Gramm. Gasolene.

Gramm-Bernstein Co., Lima, Ohio. B. A. Gramm. Gasolene, 2 to 3½ tons; prices, $2,750 to $3,600.††

Harder Auto Truck Co., Chicago, Ill. Harder. Gasolene.*†

Harwood-Barley Mfg. Co., Marion, Ind. Indiana. Gasolene, 1½ tons; price, $2,000.*††

Ideal Automobile Co., Ft. Wayne, Ind. Ideal. Gasolene, ¾, 1, 1½ and 2 tons; prices from $1,500 to $2,250.*†

Hewitt Motor Co., New York. Hewitt. Gasolene, 1 to 10 tons; prices, $1,800 to $5,500.

Hupp Motor Car Co., Detroit, Mich. Hupmobile. Gasolene, 800 pounds; price, $950.

International Harvester Co., Chicago, Ill. I. H. C. Gasolene, 1,000 pounds.††

Kelly Motor Truck Co., Springfield, Ohio. Kelly-Springfield. Gasolene, 1 to 3 tons; prices, $2,000 and up.

Kentucky Wagon Mfg. Co., Louisville, Ky. Urban. Electric, 1,000 pounds; price, $1,800.*

Kissel Motor Car Co., Hartford, Wis. Kissel. Gasolene, 1,500 pounds to 5 tons; prices, $1,500 to $4,350.

Knox Automobile Co., Springfield, Mass. Knox. Gasolene, 2 to 6 tons; prices, $2,750 to $5,000.

Koehler S. G. Co., H. J., New York. Koehler. Gasolene, 1,600 pounds; price, $750.†

Krebs Commercial Car Co., Clyde, Ohio. Krebs. Gasolene, 1,500 pounds; price, $1,375.

Lauth-Juergens Motor Car Co., Fremont, Ohio. Lauth-Juergens. Gasolene, 1 to 3 tons; prices, $1,950 to $3,300.††

Lippard-Stewart Motor Car Co., Buffalo, N. Y. Lippard-Stewart. Gasolene, 1,500 pounds; price, $1,650.†

Locomobile Co. of America, Bridgeport, Conn. Locomobile. Gasolene, 5 tons; price, $4,800.

Lansden Co., Newark, N. J. Lansden. Electric, 750 pounds to 5 tons.†

Mack Bros. Motor Car Co., Allentown, Pa. Mack. Gasolene, 1 to 7 tons; prices, $2,100 and up.

Mais Motor Truck Co., Indianapolis, Ind. Mais. Gasolene, 1½ to 3 tons; prices, $2,750 to $3,400.

Mogul Motor Truck Co., Chicago, Ill. Mogul. Gasolene, 2, 4 and 6 tons; prices, $2,800 to $4,700.*††

Mercury Mfg. Co., Chicago, Ill. Mercury. Gasolene, 1,000 pounds; price, $750.*

National Motor Truck Co., Bay City, Mich. National. Gasolene, 1 ton.*††

Old Reliable Motor Truck Co., Chicago, Ill. Old Reliable. Gasolene, 2, 4 and 5 tons; prices from $2,750 to $4,500.*

Packard Motor Car Co., Detroit, Mich. Packard. Gasolene, 2 to 5 tons; prices, $2,800 to $4,500.††

Peerless Motor Car Co., Cleveland, Ohio. Peerless. Gasolene, 3 to 5 tons; prices, $3,700 to $4,500.

Poyer & Co., D. F., Menominee, Mich. Poyer. Gasolene.*††

Pierce-Arrow Motor Car Co., Buffalo, N. Y. Pierce-Arrow. Gasolene, 5 tons; price, $4,500.

Pope Mfg. Co., Hartford, Conn. Pope-Hartford. Gasolene, 3 to 5 tons; prices, $3,350 to $4,475.

Reliance Motor Truck Co., Pontiac, Mich. Reliance. Gasolene.*

Reo Motor Car Co., Lansing, Mich. Reo. Gasolene, 1,500 pounds to 2 tons; prices, $760 to $1,800.

Sanford Motor Truck Co., Syracuse, N. Y. Sanford. Gasolene, 1 ton; price, $1,600.††

Saurer Motor Co., New York. Saurer. Gasolene, 4½ to 6 tons.

Schacht Motor Car Co., Cincinnati, Ohio. Schacht. Gasolene, 1,500 pounds to 4 tons; prices, $1,600 to $3,300.††

Selden Motor Vehicle Co., Rochester, N. Y. Selden. Gasolene, 1 ton; price, $2,000.

Service Motor Car Co., Wabash, Ind. Service. Gasolene, 1,500 pounds to 1½ tons; prices, $1,350 to $1,675.†

Smith Co., A. O., Milwaukee, Wis. Smith-Milwaukee. Gasolene, 3½ to 6 tons.††

Speedwell Motor Car Co., Dayton, Ohio. Speedwell. Gasolene, 2 to 6 tons; prices, $3,750 to $4,400.

Standard Motor Truck Co., Detroit, Mich. Standard. Gasolene, 3 tons; price, $2,750.†

Sternberg Mfg. Co., Milwaukee, Wis. Sternberg. Gasolene, 2 to 5 tons; prices, $2,800 to $4,500.

Stewart Motor Corp., Buffalo, N. Y. Stewart. Gasolene, 1,500 pounds; price, $1,650.†

Studebaker Corp., Detroit, Mich. Studebaker. Electric and gasolene; electric, 500 pounds to 5 tons; gasolene, 800 pounds to 5 tons.

United States Motor Truck Co., Cincinnati, Ohio. United States. Gasolene, 2 and 3 tons; prices, $2,800 and $3,500.*

Universal Motor Truck Co., Detroit, Mich. Universal. Gasolene, 1 to 3 tons; prices, $2,750 to $3,400.†

Velie Motor Vehicle Co., Moline, Ill. Velie. Gasolene, 1,500 pounds to 3 tons; prices, $1,600 to $3,350.

Walker Vehicle Co., Chicago, Ill. Walker. Electric, ½ to 3½ tons.*

Ware Motor Vehicle Co., St. Paul, Minn. Ware.*††

Waverley Co., Indianapolis, Ind. Waverley. Electric, 600 pounds to 5 tons; prices, $1,800 to $4,000.

White Co., Cleveland, Ohio. White. Gasolene, 1,500 pounds to 5 tons; prices, $2,100 to $4,500.††

Undesignated denotes exhibit in Coliseum.
† In Annex.
†† In First Regiment Armory.
* Not shown in New York.

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REILLY ADVISES MAN WHO IS "ABOVE HIS JOB"

Feeling Bigger Than One's Position is a Sure Way to be Smaller Than the Position—Convinces One of His Shop Men That Sweeping is Not Necessarily too Menial for a Machinist.

Loud voices, or, rather, a loud voice, penetrated the walls between the repair shop and Reilly's office and broke the train of thought which the dealer was having transcribed by the office girl as the answer to a letter from the Sales Manager, who had asked an opinion on a certain selling plan which had long been turning over and over in the factory man's mind. As the voice continued to intrude itself into the air of regularity and comparative quiet which characterizes a well managed establishment, Reilly ceased to dictate, saying, "You can write what you have; I'll be back in a minute."

He arose and was about to start for the shop, when the shop door opened and one of the shop men burst into the salesroom and then turned toward the office door; he evidently was considerably agitated, but endeavored to calm himself as much as possible as he entered the office.

Reilly Is Asked To Be a Judge.

"Mr. Reilly," he blurted out, "Williams fired me."

"Did he?" answered the dealer quietly, before the other had time to enlarge upon his difficulties with the foreman machinist. "What if he did?"

"I don't think he was justified, that's all," went on the mechanic, "and I wanted to ask you whether I'm right or wrong."

"What did he fire you for, Billy?"

"Because I didn't want to sweep the shop floor," asserted the man in overalls. "It may sound kiddish to you, but I don't believe it's my place to be a sweeper; I'm a machinist."

"I thought Williams had a boy out there who did such work as that," suggested Reilly.

"He has," declared Billy, "but the boy didn't show up to-day and Williams wanted me to sweep out."

"Someone has got to do it, hasn't he?" asked the dealer.

"I suppose so," was the admission.

"Whom do you think ought to do it?" was the next question.

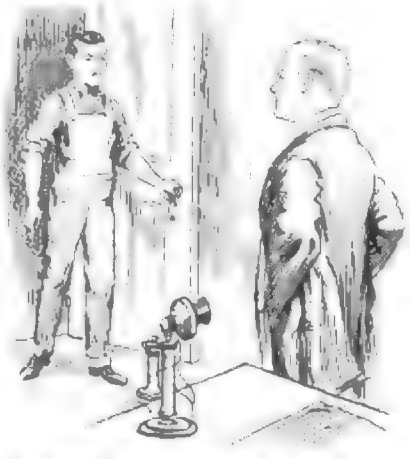
"Well—" said the man with the grimy face and hands, and he got no further in his expression, for the simple reason that he did not know what to say next; and as the man hesitated Reilly began to smile in a peculiar, quiet way that made the belligerent realize that he was cornered in the argument.

"Sit down," invited Reilly, and the workman did so. "You and Williams ought to get along well together; he's pretty square and fair with the men, isn't he?"

Diagnosign the Workman's Case.

"I never made a kick before," exclaimed the shop man; "I have always called him the best foreman I ever had."

"Maybe you're to blame this time," hinted the dealer. "Did you ever stop to think that oftentimes a man has to do things that



"MR. REILLY, WILLIAMS FIRED ME," SAID THE SHOP MAN

don't just set well with him, but which nevertheless are a part of his job? Maybe you didn't, but I know you're man enough to see it when it's explained to you that a man who thinks he's too big for his job is in reality too small for the job. You're not exactly that way, but if you want my most honest opinion, given in as friendly a way as possible, I will say that I think you have shown a touch of that feeling this afternoon. You're not going to be offended, are you, if I talk to you like this?"

"No, sir," replied the workman, who really could make no other reply; but he also was the type of man who occasionally would admit that he was a suitable recipient for advice.

"I suppose, Billy, that you have often looked forward to the day when you would be a foreman machinist, or something better than an ordinary machinist; everyone does, or ought to. But if you analyze the make-ups of the men who have fairly won their way to foremen's positions you will find that most of them were the men who did not think their work was beneath them. A machine man may get it into his head that he is too good a man to be an ordinary machinist, and that therefore he ought to be a foreman machinist. Instead of proving that he is bigger than the machine job and thereby showing his fitness for the bigger position when the opportunity presents itself, he fails to handle the machine job to the best of his ability and is heading toward a goal which is the opposite of what he had in mind.

Sizing Up the Job and the Man.

"Take your own case to-day. The shop has to be swept and kept clean, and since it is work that an unskilled laborer can do, Williams keeps a boy for that work; but the work has to be done, and if the boy failed to show up you must be able to see yourself that someone had to do it. It's up to every man in the shop to be willing to keep the shop neat and clean and maintain a good standard, so someone other than the boy had to sweep to-day; isn't that so?"

"Yes, sir," rather meekly replied Billy.

"Now, then," added Reilly, "since there were nothing but machine men in the shop, either one of them or Williams had to sweep. Williams has too many other things to do, so one of the men had to do it; and why shouldn't you do it just as much as any of the others? You get just as much an hour, whether you're sweeping or working at your trade. If anyone loses its's myself; we can get a boy for not more than 15 cents an hour to sweep, and if you do it it costs about three times that."

"Maybe I was wrong," admitted the workman. "I'll admit I was hot-headed for a minute and didn't stop to think very much about it."

"I'll tell you, Billy," continued Reilly, "there's nothing that counts for so much as a willingness to do all that your job requires—and sometimes a little more. I know a newspaper man who, when he was younger than he is now was sent out of the

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city where his paper was located to manage a little branch office. The morning he blew in he looked things over and saw at once that from being a reporter exclusively, as he had been in the city, he was going to be everything from manager to office boy in the new place. Do you know the first thing he did?"

"No," answered Billy.

"He hunted up a broom and swept the office and the whole front sidewalk," replied the dealer. "And he certainly looked out of place. Just imagine a man in patent leather shoes and the latest style of overcoat and hat acting as a porter! The point is that he really was out of place; he proved it by other things in the few months that followed, and it wasn't long before he got a bigger place.

Salesman Who Traveled Downward.

"I know a salesman for a shoe house who always will be a mere salesman, provided he doesn't get pushed down the ladder to a lesser position. One day he was at the home office when one of his customers wired in and asked that a certain size and style of shoe be rushed to him at once to fill an order for a particular customer who had to have the shoes at once, as seems to be the case with some people whenever they finally make up their minds they want anything. The customer had ordered a case, but asked that one pair be gotten to him as quickly as possible, by mail, special delivery or any other way. The expense didn't matter so much as did his holding the customer.

"Well, the salesman was going on a trip that night that led through this man's town and the office asked him if he would not be so accommodating as to take the shoes down to the customer. He refused point blank and wanted to know if he was a salesman or a messenger boy. He was in the place of a salesman but was qualifying himself for the position of messenger boy, or something not so high up. He could have made an everlasting impression upon that customer by delivering those shoes in person, but he passed up this valuable opportunity because he thought he was above such work."

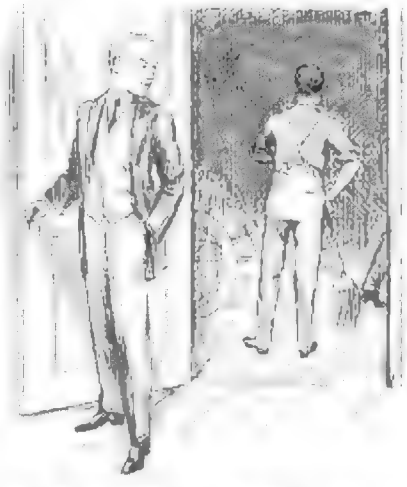
"I never thought of it that way," reflectively commented the workman, and he started to go.

The Shop Man Who Became Boss.

"Wait! Don't be in a hurry," said Reilly. "I want to tell you about another man. He was a machine man, just the same as you are; he worked in an automobile repair shop, too, just the same as you do, and he was one of the best workmen his employer ever had. I knew him personally, and knew his employer, too. This man started in as an ordinary shop hand, but he was always looking about him to see if there was not some way he could better his work, or something he could do that would make him more valuable to his employer. He never watched the clock or got the idea that he had to look sharp for fear someone would ask him to do something that was not up to his standard, and he never, so far as I know, refused to do anything that he was asked to do.

Doing the Work You Are Paid To Do.

"Also, he never got it into his head that he was above being bossed. Some men, you know, get that way. They believe that they ought not to be told anything. I don't mean that bossiness is the right thing for a foreman, but there are times when a man has to be told things. How can he know what to do or how can his employer let



—AND NOW REILLY STEPPED OUT AND CLOSED THE DOOR

him know what is to be done if the man won't be told?

"So long as a man is working for someone else he must necessarily do things now and then which he would rather not do, but he is being paid for doing those things, and if he doesn't want to do them the proper thing for him to do is to resign quietly and get another job. That shop hand got to be shop foreman after a while, but to this day he would just as soon sweep the shop as to do anything else—in fact, if I'm not mistaken, he does sweep out if it's necessary. I should think you'd like to work for him."

"I would," eagerly exclaimed Billy. "Where is he now?"

Sweeping Assumes Different Aspect.

"Come out and I'll introduce you to him," said Reilly, and he led the way to the shop.

As they opened the door they saw Williams busy with the broom. Billy couldn't stand it any longer. He marched straight up to the foreman machinist without waiting for an introduction from Reilly and took the broom into his own hands.

Reilly had stopped just inside the shop door to watch developments, and now he stepped out and shut it.

Silences Chauffeurs of Pittsburgh.

Pittsburgh may be smoky, but it isn't going to be as noisy as it was, at least so far as vociferous chauffeurs are concerned; heretofore a great many of them have been in the habit of shouting to the driver following when they wished to stop, slow down or turn a corner, instead of using the extended arm as a signal. The city fathers have grown weary of the clamor, and in a new ordinance which just went into effect incorporated a paragraph forbidding drivers to use such audible means of signifying their intention; hereafter they must "wig-wag" their intentions if they would elude the clutches of the law.

Adding More Room to Garford Plant.

Three new buildings are being added to the Garford plant in Elyria, O., the floor space of which thereby will be increased by nearly 40,000 square feet. The new structures consist of a warehouse, 60 x 300 feet, a rear axle assembly shop, 56 x 280 feet, and a four-story addition, 45 x 45 feet, to the main building. All will be of concrete construction to conform with the style of the present main building.

When Non-Skid Chains May Fail.

Too much dependence should not be placed upon chains to prevent sliding on a greasy road surface when brakes are applied, for the brakes may lock the wheels, or one of them, in such a position that the tire rests directly on the road between two cross-chains and is free to slide. Should this occur, the proper thing to do is to ease up on the brake and let the wheel turn a little until the chains grip.

To Make Tan Leather Turn Black.

As a simple and harmless means of permanently blackening tan leather, it is recommended that it be rubbed first with a 10 per cent. solution of tannic acid, which should be permitted to dry thoroughly. Afterward, a 10 per cent. solution of iron sulphate should be applied and in turn permitted to dry. Both chemicals are easily procurable at any drug store.

The accuracy of the machining of the valves of a well-known foreign car is tested by inserting the stem in a hole drilled in a steel block and letting the seating come down on a corresponding seating in the block. The gauge being absolutely accurate, any failure of the valve to seat properly indicates a fault.

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BUILDING A FRONT WHEEL TO MEET AN EMERGENCY

Not a Handsome Job, But One That Answered the Purpose and Took the Car Home—How It Was Done.

All the trouble occurred on one of those mean little creek bridges—one of the kind that makes an obtuse angle with the road by which it is approached, being built straight across the water doubtless because it would cost an extra eleven dollars to build it on the skew and maintain a straight line with the road on either side. It was early in the morning, and cold, and the rain of the night before was ice on the planks, though the roads were in fairly good condition.

The car was going too fast. Had the bridge planks been dry it would have been all right, but as they were not, the car promptly executed a fancy lateral slide with the result that one of the front wheels was driven with a crash against the heavy timber railing. The timbers suffered but little, which was a matter of no particular importance; the thing that counted was that the wheel was wrecked—hopelessly wrecked. The mudguard was wrinkled considerably and a lamp collapsed with a tinkle of expensive glass—but the wheel was the serious part of the incident. It was utterly useless.

Forty-five miles from a new wheel, ten miles from a railroad station and half a mile from a village, and for various reasons it was necessary to get the car to the city that night. Obviously the first thing to do was to explore the village, which, being done, revealed nothing more hopeful than a combined blacksmith and carpenter shop.

"Let's see that machine, anyway," suggested the carpenter.

He saw it.

"The wheel's gone," he announced, in the tone of one imparting news. "If you ain't too pertickler, though, I guess I could rig somethin' to git the machine home with."

No; nobody was "pertickler"—anything to get the machine home.

"Will that iron hub come off?"

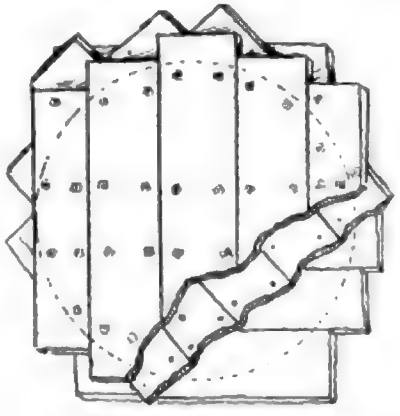
It would and it did.

"Now, if you'll come back to the shop mebbe you can save a little time by helpin' me."

At the shop the outer flange of the hub was taken off and the remains of the wheel removed. So far as appearances were concerned, the hub was not bent to amount to anything. The carpenter rummaged out some ¾-inch oak lumber and gazed at it reflectively.

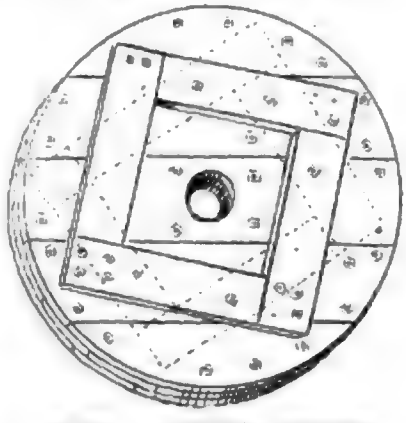
"It's a pity to use up that stuff," he remarked regretfully, "but I guess soft wood won't be no use." So he attacked the boards with a saw. "We'll build up a wheel that'll get you home somehow."

So a wheel was built up, and when it was finished it looked very much like one of



EMERGENCY WHEEL IN BUILDING

those ancient ox-cart wheels that they used in India or somewhere and that never was oiled, so that they squealed continuously—which has nothing to do with this story. A layer of short boards was laid down and a second layer on top of it, the second being placed at an angle of 45 degrees with the first and the two fastened together with a few nails. A third layer was added, at



WHEEL READY FOR SERVICE

right angles to the first, and screwed down. Thus there were three layers, with the grain running at different angles.

A circle was marked off just the diameter of the wheel, which happened to be 34 inches, and a second and smaller circle of the diameter of the barrel of the hub. The hole was cut out with a keyhole saw, and though it was something of a job because of the thickness of the wood and the hardness of the well-seasoned white oak, it was as nothing compared with the labor of cutting down to the big ring. Had there been a band-saw in the village the work could have been done in one-tenth of the time.

To hold the layers firmly together, a set of cleats was put on each side, each set forming a hollow square. The corners of the square on one side of the wheel—that's what it must be called, no matter what it looks like—did not come opposite the corners of the square on the opposite sides, but half way between; the accompanying illustrations make the arrangement plain enough. The whole imposing structure was firmly bound together by a lot of carriage bolts put clear through both sets of cleats where they crossed, and also through the boards inside and outside of the cleats. The bolts were driven into bored holes in which they were a tight fit, and washers were put under the heads and also under the nuts, which were pulled down hard and the ends of the bolts slightly riveted over.

A little paring and fitting was required to get the contrivance on the hub. Holes for the hub bolts were marked off with a pencil from both sides and the holes bored from both sides, the bit being sent half way through from each mark so that the bolts would come out opposite the places where they went in. It was rather a mean little job, and some of the holes were so kinked in the middle that it was necessary to resort to the use of a red-hot iron to make straight the paths for the bolts, which finally were worried into their places and pulled down hard.

"Naow!" said the carpenter, standing off a little with his head on one side admiring his handiwork. "Mebbe you'd like to have a coat of red paint put on that there—naow—wheel."

The offer was declined hastily and with thanks.

"Well, mebbe you're right; it don't match the other wheel none too good as it is, does it?"

Which it certainly didn't.

With a round stick through its center the wheel was trundled to the car, which stood on the bridge under a guard of small boys and the village drunkard. It went on all right, and once more the car stood on four wheels. It looked all right, too—from the other side. It was too bad, though, that the new contrivance was on the left side, where it was displayed in all its beauty to the occupants of the cars that were met, to say nothing of the many machines that overtook the "cripple" on the road. The journey of 45 miles was accomplished without incident and without breaking any speed laws, but it must be recorded that the obvious interest of other people along the line became somewhat cloying, in time. Beyond losing a few chips from its rim, the oak disk arrived at its destination in as good condition as it started, and—well, if anybody wants to buy a nice, substantial spare wheel, it's there yet.

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Solutions of the Used Car Problem

In Competition for Motor World's Cash Premiums of $50, $25, $15 and $10 for the Best Four Articles Dealing With the Subject.

By H. G. CHADWICK, Boston, Mass.

The solution of each individual dealer's second-hand problem lies with himself, as a co-operative clearing house can not and will not prove successful until the retail automobile industry is placed on a more generally businesslike basis.

There are too many "weak sisters" engaged in the sale of automobiles at the present time and, until the process of elimination has weeded them out, the successful dealer who depends on good judgment and salesmanship for his profit will decline to enter into an association with those who cannot resist the temptation to sell a car at a fraction of their legitimate profits. There are too many ways in which, if he wants the order so badly as to be willing to sacrifice a good portion of his commission, he can evade any rules a clearing house association might formulate. "Buy my car, Mr. Prospect," he will say, "and I will give you a hundred, more or less, over what the clearing house gets for your car." This and many other methods of evasion will be his manner of following rules.

Those who are intent upon building up a profitable, permanent business should have little difficulty in handling the situation in a satisfactory manner.

One of the leading New England concerns (whose sales greatly outnumber those of other moderate price car agents) has a system which is followed religiously. Before a prospect's car is appraised, a trained salesman has a demonstration—turns buyer, and makes the owner show him the car's good points, while he has eyes and ears open for its bad features. Then a figure is named, which is based upon the condition of the power plant, tires, etc. An estimate of the expense necessary to put the car in a demonstrable and saleable condition enters into the proposition, and, most important of all, the standing of that particular make of car in the local market.

The unknown or unpopular car shrinks twice as rapidly in the first year's depreciation as the standard make, the manufacturer of which is financially sound and whose reputation is beyond reproach. As a rule, 40 per cent. depreciation for a car that has been run one season is the average, but some cars that are difficult to move bring as low as 40 per cent. of the original cost after only one year's use.

Often a deal is made in which a car of questionable value is traded in on a proposition whereby the owner gets all over a certain figure which the dealer allows outright, that figure being low enough to protect the dealer against much of a loss; but as a rule the transaction closes with an allowance which must be acceptable to the owner and which allows the agent a fair chance to get out whole and realize the full commission on the new car sale.

After the used car is received by the dealer, it is turned over to the second-hand car department, tuned up, thoroughly cleaned inside and out and made as presentable as possible. A cleaned power plant on which a little aluminum paint and lampblack has been used, together with polished brass, properly inflated tires and touched up enamel will work wonders toward creating "the desire to own" in the mind of the second-hand car prospect.

If the paint is in very poor condition, a small sum spent in that direction is usually well invested, and before showing a car to any prospect it should always be at its best and placed where it will show up to advantage. "Fine feathers make fine birds" and in the used car business a little painstaking attention to appearance brings out the truth of the saying, although some time must also be spent in putting the car in running condition.

As a rule we will find that the automobile dealer who curses the necessity of taking second-hand cars in trade is the one who tucks them away in the basement and allows them to become so shabby in appearance that it is almost impossible to secure anywhere near their real worth in the open second-hand market.

By JOHN R. OAKES, Galesburg, Ill.

Used cars? What shall we do with them?

Standard proven cars selling at $2,000 and upward should be rebuilt at the factory, and resold in the regular manner; priced as any other article of merchandise—viz., at a figure that yields a reasonable profit to the factory for labor and material and to the retailer for his part, as well as transportation charges.

Any standard car thus handled will meet with ready sale, because the public already knows the car and trusts the company back of it. Thus is one great item of expense practically eliminated—that of advertising; so that a really high-grade car comes within the reach of thousands who otherwise would buy a new car at $1,000 to $1,500 and not have nearly so good a bargain as they could in the high-grade rebuilt article.

I believe this system could work adversely to none except the makers and venders of the cheap, inferior cars, would be a boon to the public and redound to the success and honor of all that is good in this great industry.

Cars selling at $500 to $1,500, with few exceptions, are not designed for longevity so much as for initial low cost, so that they close their career of active existence much as did the "One Hoss Shay." This general collapse has usually been preceded by a reasonable service for the investment, but it is so general as to baffle any hope of satisfactory reconstruction; so off to the dealer hies the owner and forthwith talks trade. In such a case the dealer has two items to juggle—his commission on his new car and the junk in the old one. Many dealers swap the former for the latter, and, of course, sooner or later appear discreditably in Bradstreet's little journal of facts.

The used car is not so much a problem as an excuse behind which the price cutter hides from his own conscience and from outside criticism. His part and place in the trade is regrettable, but will be less and less until price cutting via the used car route will be as negligible a factor in the automobile business as it has become in any reputable line of merchandising.

As a last word, the used car has a value relatively easy of ascertainment; to this the owner is entitled, and to no more. No law, agreement nor combination of men can pervent some dealers from giving more, except the law of average, and upon that we may depend for final redress, for it will put such dealers out of business.

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THE LADY AND THE LIMOUSINE; HER STORY

Being the Experiences of a Woman Prospect Who Encountered the Sort of Salesmanship that Sells Cars and the Sort that Does Not—Shortcomings that Exist in Retail Establishments.

Say "limousine" in the average automobile salesroom, and if the salesman does not prick up his ears and display unwonted interest it is because something ails him. Limousine spells "big money" and he is a mere time-server and not a salesman who is not proud of a large sale. But that not all salesmen are equal to the opportunity when it presents itself was made clear by the experience of an intending woman purchaser who recently made the rounds of a number of the better known establishments in one of the largest cities in the country.

She encountered extreme courtesy and lackadaisical indifference, and pretty nearly everything that goes between. If she had



SHE ENCOUNTERED EXTREME COURTESY

been less intent on purchasing a car, her first experience must have discouraged her.

Indifference as an Antagonizer.

In advance, she had become much enamored of a particular car of national reputation, listing at less than $4,000, and her first steps led in the direction of the store in which it is sold. She said "limousine," but the salesman failed to prick up his ears. He had none in stock—and that was the substance of what he told her. He seemed tired to the point of indifference and made not the slightest effort to induce the prospective purchaser to call again. But for her interest in the car she vowed she never would have set foot into the place again.

However, she paid a second visit and fortunately met a radically different type of salesman. He chewed gum, but otherwise he was politeness itself, and if he failed to make the sale it was no fault of his own. A limousine had been received but, as the salesman courteously explained, it already had been sold; in fact, the firm was sold up for a month ahead. The lady, however, was permitted to inspect the car which was awaiting delivery, but to do so it was necessary to go through a not particularly inviting shipping room, enter a freight elevator and go to an upper floor where the body just had been fitted to the chassis.

The Last Touch of Courtesy.

In relating her experience, she remarked the fact that the salesman was so courteous and diplomatic in handling her that she overlooked the inconvenience, the last touch of courtesy being escorting her to her tour-



DEEPLY INTERESTED IN NEWSPAPERS

ing car which waited at the curb. As a whole, her experience was so varied that it cannot but afford instruction to the owners and managers of every establishment engaged in the sale of automobiles and who seek to improve their ways and the ways of their salesmen.

Sales Secondary to Newspaper.

After being shown to her car, the lady visited two other stores in which cars listing at more than $4,000 were for sale. In one, the salesman was alert and met her with a smile and a cordial manner; in the other, the two salesmen were so deep in their newspapers that it was necessary for her to arouse them. Once aroused, however, the one who took her in hand led her skillfully to the good points of his car. His case, however, became hopeless when the lady sought to discover what constituted the equipment of the car. When she detected that several things dear to the average woman's heart were lacking, and he informed her that they were "extras," the interview terminated soon after.

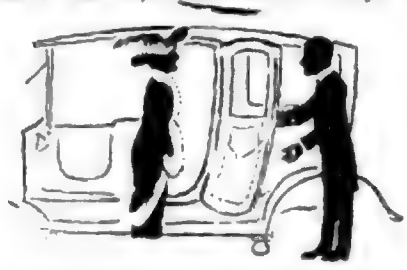
"Oh!" she exclaimed, "I want a car that is all dressed up. I thought your price included everything. I wouldn't pay a penny extra, and at your price I can't see how you can expect it."

She laughed amusedly in relating some other of her experiences.

"In one place," she said, "the salesman almost apologized for the absence of a person whom he called the 'sales manager.' He would like very much to have me meet him, but, unfortunately, that distinguished gentleman was lunching at Sherry's, or Delmonico's—I forget just which place. I don't know whether I was informed of the fact as a means of impressing me, but I am afraid I smiled in the young man's face.

Sample Car Too Costly an Item.

"In this store also there was no limousine in evidence. In fact, that was so generally the rule that I finally remarked it, and suggested that department stores always re-



THEY HAD A BODY ON ROLLERS

tained at least one sample of everything, no matter what it might be. The salesman to whom I made the remark expressed his regret and impressed me with the heavy demand for their limousines and of the idle money which would be represented by a sample car of such value remaining unsold for any length of time. I could not but admit the force of the statement, and in one of the last stores I visited I found that at least one firm had found a way of solving the difficulty.

"There, on the salesroom floor, they had a limousine body standing on rollers, or skids, or whatever you call them. It abundantly served at least my purpose. I chiefly was interested in the external appearance and appointments of the interior of the car, and as this firm also had a bare chassis on the floor, it was a simple matter to inform me that the difference between the limousine and the touring car was wholly a matter of body, the same chassis serving for both.

Salesman Lacked Manners and Gumption.

"In still another establishment in which they had nothing to show, the young sales-

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man sat on the edge of a table as he talked, and kept his hat on his head while he did so. I had heard his car well spoken of and was rather anxious to see it, and when he informed me that a customer's car was having work done on it in a nearby service station I accepted his invitation to go and see it. The driver of their demonstrating car was in the salesroom at the time. He was smoking a cigarette and wore his cap with the peak pointed to the rear, and I had to ride behind that fellow to the service station. The salesman himself had not gumption enough to accompany me. In fact, he lacked it to such an extent that he did not even open the store door for me to make my exit.

Long Wait in a Service Station.

"At the service station—a large establishment—I waited 10 minutes before anyone could be found to take me to see the car, and again it was necessary to go to an upper floor in a freight elevator and dodge around between repair work and repairmen. The chauffeur who finally located the car apparently was either dumb or knew nothing about it, and while the car is a good one, it could not speak for itself, and after my experience I don't think I would have bought it even had it been able to do so.

"One of the politest men I met was doing business amid the most discouraging surroundings. His store was so small and so crowded that it was difficult to turn around in it, but the man himself—he was the proprietor—was so pleasant and such an agreeable talker that he more than made up for the drawbacks of his store. Once when I mentioned a rival car he spoke so highly of it that I could not well fail to think well of the man himself. His store was too small to contain a limousine and the only one he had was stored in a basement several blocks distant, but the man was so much a gentleman, and was so nice in every way, that I could not well refuse his invitation to inspect the car. Unfortunately, I never saw it. When we reached the dimly lighted basement he found he had forgotten the key to the storeroom.

Frankness That Impressed Favorably.

"Perhaps the car had something to do with it, but when I look back I think the salesman who most impressed me was neither particularly bright in appearance, alert in manner nor engaging in conversation. He was quiet, rather slow-spoken and plainly not particularly well educated. Perhaps he impressed me favorably because he agreed with nearly everything I said, but, at any rate, he was well informed regarding his car and he was plainly honest and sincere in his answers. He was not given to the exaggeration which I encountered in several places. He did not attempt to tell me, for instance, that they were getting 16 or 18 miles per gallon out of their car, as other salesmen had told me, when I knew that our own—a much lighter touring car—was not able to give more than 10 or 12 miles at the best, although the cars sold by other of the exaggerators employed the same carburetter that we did.

"But in this honest looking fellow's place, as in so many of the others, there was no

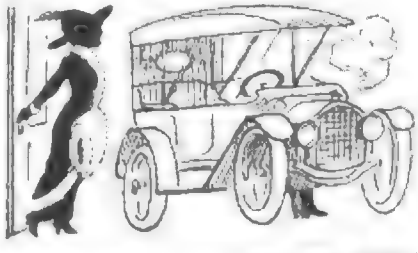


HE KEPT HIS HAT ON HIS HEAD

one 'on the door,' so to speak. Twice when I called there was not a living person in sight. Both of the salesmen were seated at their desks, which were hidden by the cars, and although once I purposely slammed the door no one immediately came forward to meet me. In at least two of the places I visited I found men hurriedly throwing away cigarettes, or putting down cigars before they came forward. In another store, I found three men seated in a touring car, reading newspapers, and it was not until I bluntly asked a question that any of them paid the slightest attention to me, and then they informed me that the company that sold the car, the name of which was displayed on the window, had moved elsewhere several days before.

Salesmen's Faith in Demonstrations.

"Demonstrations?" said the lady repeating the question. "Oh, heavens! If I had accepted all of the invitations I would be riding yet. Nearly every salesman seemed to imagine that a demonstration was all that was necessary to close the sale, and,



THERE WAS NO ONE "ON THE DOOR"

strangely enough, nearly all of the demonstrations tendered me were touring car demonstrations and not limousine demonstrations. Perhaps there's no difference, but somehow I am possessed of the notion that there is such a difference in the feel of the two cars that no touring car demonstration ever will prove more than half-sufficient to the intending purchaser of a limousine.

"My opinion of automobile salesmen? They're a much-mixed lot," she replied. It is plain that a number of them have much to learn and that many of them would not last long in a department store where they would be watched, and where they are required to do certain things in certain ways."

Possibilities of the Parcel Post.

When first the Parcel Post approached reality those within the automobile industry who were heartiest in welcome maintained that attitude because of the number of motor driven vehicles which it was announced that the new governmental enterprise would require; however, there now is opening another field wherein the post may be of great service to the trade. That is in transporting small articles such as parts and supplies.

The first extensive use of the post for automobile purposes occurred in the State of Iowa, where about 5,000 license plates have been distributed through the mails. Some delay was experienced in turning out the numbered tags, and when a shipment of about 5,000 was received at the State capitol shortly before the old year died, they were held until the new regulations became effective and were distributed in that manner. The authorities in Wisconsin plan to make a similar use of the post, and Secretary of State Frear states that in distributing the 25,000 license plates which will be used about $2,500 will be saved. Formerly the plates were expressed.

Queen Mother Buys Miniature Cadillac.

When those who were responsible for a miniature Cadillac car that amused visitors to the recent French show evolved the idea of its production it is unlikely that they suspected what its ultimate destination might be. It has been purchased by Great Britain's Queen Mother, Alenandra, as a gift for one of her grandsons.

The car is an exact replica of a full-sized Cadillac, with all its dimensions reduced to two-fifths; the wheelbase is four feet. Power to drive the vehicle is obtained from the Delco electric lighting and engine starting system with which all Cadillacs are equipped, there being no gasolene motor. Control is effected by means of a side lever working in a quadrant, and the speed obtained is 16 miles an hour. An idea of the size of the car can be gained from the dimensions of the tires, which measure 15 x 2 inches and were especially constructed for the service. The "baby" car is completely equipped, of course, even to a miniature real Klaxon signal and a top and windshield,

IN BUSINESS FOR FUN AND YET MAKES MONEY

Toronto Dealer Who Takes Delight in the Tight Corners of Business—Works on the Principle That What He Must Have He Will Surely Get—Trade Tactics That Have Made Sales.

Putting business before pleasure is supposed to be, and perhaps is, the only sound theory to be pursued by him who hopes to attain success, and if a man should declare that he was launched upon the business sea at the age of about 16 with no money and an inherent desire to put pleasure before the drudgery of business and should further state that he had always let his desire be gratified, one naturally might expect this individual to be an itinerant mendicant, riding the brake rods with a sandwich in his pocket.

On the other hand, should this man prove the possessor of a prosperous business in a city of 300,000 inhabitants and still insist that his former statement were true, the congruity of the facts might be difficult of explanation until the man cleared the situation by the assertion that he is in business for the "fun there is in it." The man who is the principal actor in this peculiar "play" is W. J. Ross, who is the substantial portion of the Ross Motor Car Co., Ltd., of Toronto, Ont.

Works Hard Because It Is Pleasure.

Ross does not appear to recognize the fact that a man will work hard at pleasure and that, while Ross is having a lot of fun, he nevertheless is working to the limit. And his hair isn't getting gray, either.

He is Canadian distributer of Regal cars, and is an excellent type of the man who has become a rattling good salesman without very extensive schooling in salesmanship, or any other form of instruction. The Ross formula for becoming this type of salesman is: Have your father fail in business just as you are getting through high school; get a job in a machine shop at $2 a week and pay $3 board; work up in this trade until you see there is not much in it; buy a moving picture outfit and tour the country, acting as a "lecturer"; return to your home city; decide you want to be an automobile dealer; order a load of cars and then dig around to find the money to pay for them when they arrive. The latter move might seem difficult, but it was mere matter of fact performance with Ross, who works on the principle that inasmuch as he had to have the money to pay for the cars, the only result conceivable was that he would get it—how was something to be figured out after the ordering of the cars had been attended to.

Such work is what adds zest to Ross's business; getting the money and then ordering the cars would have been too usual. In like manner he one day went to a bank and said, "I need $600; I suppose you'll want a note or something?"

"Note!" exclaimed the manager. "You talk just as if you were going to get it."

"I've got to have it," answered Ross, "therefore I'm going to get it; one of the purposes of a bank is to loan money to the business men of the city, and of what good are you to me if you don't loan me money?"

When Nerve Effected a $600 Loan.

The very nerve of the thing was of more avail than a pocket full of references, and Ross got the money; also he paid it back when he said he would, and has borrowed there ever since whenever occasion has demanded it. One day a salesman tried to load Ross up with a stock of goods; the salesman said he was willing to extend credit on Ross's rating.

"Rating!" said Ross, "I haven't any."

"Yes, you have," insisted the salesman; "it says, 'This man is an A No. 1 salesman and will make good.'"

Originality bristles out all over this Canadian dealer; he sells cars in his own way, but the main point is that he sells them, and demonstrates his true salesmanship in that his customers come back for more. Selling cars in Canada, he states, is difficult, because competition is more than keen; the dealer in the Dominion not only is obliged to compete with cars of European, Canadian and American make, but in addition, he says, American manufacturers make Canada a dumping ground, shipping their surplus stocks into that country at prices which make life miserable for the established retailer.

Christmas Remembrances Effective.

Ross has been Regal distributer for all of Canada only a year; previously he was Toronto dealer only. As stated, he borrowed the money to go into business, but, as he himself expresses it, he "is now on his way back from the poor house." Why and how he sells cars is exemplified by instances of his business methods. A year ago Christmas he performed a clever business stroke that aided in making him solid with his clientele. He decided to remember some of those who had bought cars of him within the last couple of years and believed it would be appreciated, especially by those men—and women, too—who are on the shady side for forty, for they, said Ross, "are looking backward at the Christmas times that have gone before; they are not filled with the exuberance and hope for the future that fills the heart of the younger men, and they are quick to appreciate a Christmas remembrance."

Some of Ross's customers smoke; others do not. Cigars would not be acceptable to all, so he went to a candy dealer who was a Regal owner and whose goods bear a standard name which is beyond reproach and spent nearly $100 for candy. His car and a driver delivered these packages Christmas morning, with the Ross card attached, to a list of about four score of his customers. The effect was magical. Such tactics on the part of automobile dealers were unknown, and straightway he became more than "the man who sold them their cars"; he became their friend. At least three sales are directly traceable to this act, for the news was not slow in spreading, and what Ross lost in dollars he more than gained in new customers and added profits.

Winning Through Fair Dealing.

Ross says he rarely has trouble over his repair work, because he will never deliver a car until the owner has called at the Ross place of business, ridden in the car with a Ross employe and thus given an opportunity to make sure he is satisfied. On one occasion when he failed to follow this policy he was compelled to sue for his account. The action had been postponed once or twice, and the day before it was again due for trial Ross telephoned the defendant and said: "I suppose you know our case comes up to-morrow? I don't want you to forget about it."

"So it is!" exclaimed the owner: "and say! I can't possibly attend to-morrow."

"I am perfectly willing to postpone it again if it will be any accommodation," replied Ross, and before the owner could reply the dealer added: "What's the use of us

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quarreling over a little thing like this? I know you think I overcharged you, but who knows better than I do how much work and material were required on that job of yours? Do you suppose I would be a judge of any bill that you rendered? And is anyone in this town likely to do better work on Regal cars than I am? Come in, anyway, and let's talk it over."

This treatment won the owner. Not only did he come in to "talk it over," but he paid the bill and actually bought a new car. He admitted that he might have been illy advised when friends told him he was overcharged, and proved easily open to amiable argument.

That it is difficult to secure cash payments is disputed by Ross.

"I do a cash business," he said, "and find little trouble in doing so. If you go to buy insurance or a railroad ticket you have to pass your money in through the window before you get it. If a big and wealthy corporation like those will not give credit why should and how can I, who have much less money, extend credit? When I present the situation in this light, most people see the point and admit the force of it."

One Solution of Used Car Problem.

Similarly, when intending purchasers talk much of guarantees and become insistent Ross has an answer for them. "You don't want a guarantee; what you want is insurance," is the substance of it.

The used car problem is no problem at all with Ross; it fits into his plan of merchandizing, and cars are traded freely but never at a loss. Several deals may be necessary before the sale is cleaned up, but it only serves to inject the business maneuvering which he likes, and often, not valuing the selling labor, a car that sells in Toronto at $1,325 will bring nearly $2,000.

He even buys used cars. One was purchased for $800. This was traded for another used car and $650, and the second used car was sold for $300 and an equity in a property that bore an $800 mortgage but would bring $1,000 under the hammer. Many of the deals involve real estate transfers, and Ross prides himself on his ability to estimate the fluctuating value of Toronto property.

Deals Are Involved But They Pay.

A new $1,325 car was sold for $925 and an $850 equity in a piece of real estate which eventually will net the dealer a profit of several hundred dollars. Another car of this type brought $925 and a used car. The used car and $50 bought a mortgage of $1,050 which carries 6 per cent. interest and is payable at the rate of $25 every six months. There are numerous deals like this which require business engineering, but which are more a pleasure than a hardship to the engineer.

Unlike many dealers, Ross is willing to turn a dollar at anything and is willing to learn anything he can about selling. Russian fur sellers are admitted to be some salesmen in Canada, and when a pair of them offered a coat, rug, muff and other pieces to Ross one day he determined to get a lesson in salesmanship. They first asked $400, but he studied their methods until the price was $150; then he bought.

"No," he said to the salesmen, "I don't want the furs. But I know a man who may buy them, and all you get over $150 we'll split fifty fifty." Ross summoned a prospective buyer to his office and watched the whole deal retransacted. The second price was $200 and, besides getting additional instruction in that class of merchandizing, Ross made $25.

Good Turns Bring "Tips" of Sales.

Although he does not use the American word "service," that is a vital part of his business. He is ever on the lookout to do a good turn for anyone, and the result is a wide circle of Toronto citizens who are constantly "tipping off Ross" to prospective buyers. He spends considerable money in advertising. He says he would rather put money into advertising than to use it in beautifying his salesrooms. He tries to hold his customers close to him by various means. For instance, he sells a five-gallon can of oil, that ordinarily costs 85 cents a gallon, for 65 cents, merely to accommodate his trade and handles accessories on the same basis.

Adaptability and alertness of mind and speech partially describe his make-up. When a woman who owned a Regal ceased to buy gasolene of him, he discovered that she doubted that she had used such a quantity as she had paid for. He diplomatically invited her to "drop in," and then asked her how much she had bought elsewhere, and when that quantity and those of Ross's bill were compared with the reading of the odometer, the car being at the door, he showed the woman that, from her own figures, that car must have given an unprecedented mileage per gallon. There was no answering argument.

Making Good Nature an Asset.

From this it might be imagined that Ross got the amount of his bill; but he didn't. He had proved to the woman that he had good reason for his claim, but, said Ross, "She wouldn't have paid anyway; she still owes me." He states, however, that this bill is one of few which he has failed to collect, and just as he laughs as he describes his methods it is plain to see that the same laugh is a valuable business asset.

Believing that when in Rome to do as the Romans do is good policy, Ross has been known to wax his moustache and simulate a French Canadian when doing business in Lower Canada, just as when in Nova Scotia he can employ the Scotch accent to perfection and talk more like a Scotchman than the Scotchman himself; for Ross, by the way, is a canny Scot.

Imports Continue to Decrease.

Losses by Germany and the United Kingdom served to more than offset gains made by the other automobile-exporting countries, and as a result the importations into the United States during November last fell away 9 per cent. in number of cars and $15,782 in value, or 7 per cent. The first 11 months of 1912 were less than that period of 1911 by 188 cars, or 22 per cent., and $99,479, or 5 per cent., the figures for 1911 being 869 cars at $1,871,414, and for 1912, 781 cars at $1,771,935. The average value of cars imported in November, 1912, was $2,279.

The country which made the greatest gain was France, whose shipments went from 32 to 42, a gain of 10 cars, or 31 per cent., while the value jumped from $94,291 to $108,356, an increase of $14,065, or 15 per cent. The United Kingdom's shipments declined by 16 cars, or 70 per cent., and $29,482, or 62 per cent. The parts shipments for the Novembers lost by $8,587, or 27 per cent. The figures in detail are:

	Nov., 1911. Number.	Value.	Nov., 1912. Number.	Value.
France	32	$94,291	42	$108,356
Germany	18	41,768	11	28,206
Italy	18	22,897	19	25,952
United Kingdom	23	47,152	7	17,670
Other countries	5	8,025	8	18,167
Total	96	$214,133	87	$198,351
Parts (except tires)	..	30,450	..	21,863
Total cars and parts	..	$244,583	..	$220,214

Seaton Forms Spring Wheel Company.

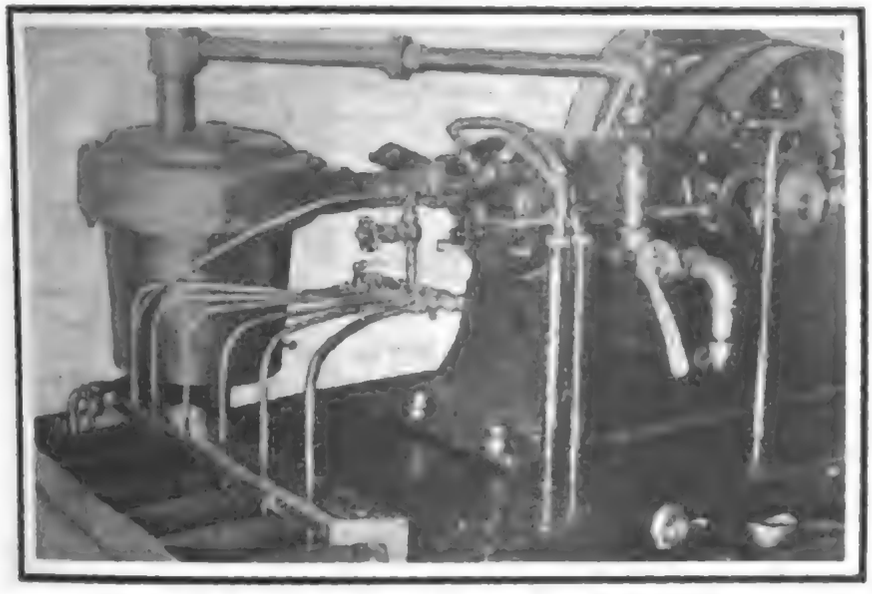
B. C. Seaton, a former wheelwright now resident in Nashville, Tenn., who for more than five years has been engaged in the invention of a spring wheel, finally has interested capital in his device and the organization of the Seaton Wheel Co., of Nashville, has resulted. It has been incorporated with an authorized capital of $130,000. The officers of the company are: John T. Landis, president; S. S. Lord, vice-president; Granbery Jackson, treasurer; J. R. Boone, secretary. Inventor Seaton will be general superintendent. It is the intention of the company to form 100 or more subsidiary corporations throughout the United States. One of these subsidiaries, in which J. R. Tubb of Sparta, Tenn., and Frank S. Wheeler of Mt. Pleasant, Tenn., are interested, is being organized in Nashville itself. The Seaton wheel is of the "wheel within wheel" type.

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STRANGE NEW MOTOR USES ALMOST ANY LIQUID FUEL

Has Neither Carburetter Nor Piston Rings But Burns Anything From "Gas" to Tar Oil—Operation Explained.

When a problem that affects a very considerable percentage of the population of the earth grows to such proportions that its shadow becomes heavy and chilly and causes the people to wonder if they ever again will see the light of reasonable prices, there usually is a movement—or rather a multiplicity of movements—set on foot to clear the air and restore normal conditions. So it is with the fuel problem that is causing so much good ink to flow over so much good white paper, and is perturbing so many brains stored with the lore of oils and their distillation and of gas engines and their combustion. Broadly speaking, there are two lines of endeavor, one leading in the direction of a new or modified fuel and the other trending toward the adaption of motors to available liquid fuels.



TISMER'S ENGINE SHOWING INTAKE AND FUEL PIPES

The adaption of existing motors to existing fuels is the line of work that has engaged the attention of P. G. Tismer, of New York, for many years, and the first, but by no means the last, surprising feature of the system he has evolved for the consumption of heavy oils is that it involves the abolition of many parts of the conventional engine and their replacement with simpler apparatus or else with nothing at all. For instance, the carburetter has been wholly dispensed with, and in its place there is—nothing. The fuel pipe leads straight through the cylinder head without so much as a spray nozzle and without an injection pump of any kind. There is no cooling system; it is necessary only to state that the motor in question is an old one, formerly water-jacketed, but that there are no water connections, and the plugs in the jacket have been removed. There are no rings on the piston; nevertheless, there is no indication of loss of compression and no signs of abnormal wear, though the engine has been running long enough to develop wear had conditions favored it.

Demonstrations of the ability of the engine to run on almost any liquid fuel are being made at 134 East 41st street, New York.

As to what the motor will do, it would appear that it will do just about what any well-ordered gas engine will do, and that on almost any liquid fuel. As the accompanying illustration shows, there is a row of little tanks from each of which a pipe leads to a header; from the header a single feed pipe runs to the cylinder head. There is a cock on each pipe, and any fuel or combination of fuels can be drawn upon. The tanks contain ordinary crude oil, kerosene, fuel oil, gas-house tar, machine oil and a mixture of oils rejected by the motor, as will be described later. There is but little difference in the running of the motor, no matter what fuel or combination of fuels is fed. From a state of stony coldness the engine will start quite readily on crude oil or gasolene, and on any of the other fuels when it has been well heated by running.

Piston Operates Without Rings.

This iconoclastic motor is an old machine—in fact, an obsolete model— having a single horizontal cylinder of 3½ inches bore and 4⅝ inches stroke and valves in the head, the intake being automatic and the exhaust valve operated by a rocker arm and a long push-rod. The original piston has been discarded and the new one is a plain cylindrical affair, without rings or grooves of any kind; it is a little longer than the average piston and has a clearance in the cylinder of half a thousandth all round. It is very deeply cupped; the "head" is sunk until it is practically in the middle of the piston, the piston pin thus being somewhat farther forward than usual. The piston comes quite close the cylinder head on the compression and exhaust strokes, so that the compression space is almost wholly within the cup of the piston.

Feed System of But a Single Pipe.

The many-piped fuel feeding system is intended for demonstration purposes only. Ordinarily there would be but a single pipe, unless the fuel should be one upon which the motor could not start, when a small auxiliary starting tank would be required. A single feed pipe leads straight through the cylinder head, interrupted only by an ordinary regulating valve. The oil is drawn merely by the partial vacuum created by the piston on the intake stroke, the quantity being regulated by the valve in the line pipe. An air pipe, of about the same size as the oil feed pipe, joins the latter just before it enters the cylinder head. Close to the cylinder, seated in the fitting which serves to connect the fuel pipe with the cylinder head, is the spark plug, which is unusual only in that it has two separately insulated electrodes instead of one insulated and the other grounded. It is so located that the fuel passes over the sparking points at every intake stroke, thus assisting in cooling the points, but apparently not interfering with ignition.

Exhaust Gas Fuel at Low Speed.

An ordinary high-tension ignition system is fitted. The main air supply is taken in through what formerly was the intake pipe, a plain valve being used to regulate the air supply. A small pipe leads from the exhaust pipe to the main air pipe, which it enters between the regulating valve and the intake valve. This is for a rather curious purpose. When the motor is to be throttled the method is to cut off part of the air supply and admit exhaust gas in its stead, the result being that only part of the normal charge is burned because there is not sufficient oxygen to consume all of it. Lubrication of the cylinder is effected by means of a large sight-feed oil cup placed on the top of the cylinder.

The most remarkable fact in connection with the running of the Tismer motor is that the raw oil is drawn into the cylinder and burned with air; if there is an excess of fuel, that which is not burned is thrown

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out with the exhaust and collects in the bottom of the cast iron muffler "pot," whence it is drawn off occasionally and can be used as fuel. The air which enters with the fuel is taken in merely for the purpose of assisting in the cooling of the sparking points, which otherwise become overheated. That the small air current does not have any effect aside from this cooling of the points is indicated, Mr. Tismer states, by the fact that the motor runs equally well without it until the points overheat and burn. The inventor states that when an excess of fuel is passed through a certain amount of it goes off with the exhaust in the form of smoke, and so there is a little waste.

Excess of Fuel That Is Beneficial.

The extreme cheapness of some of the fuels—the gas-house tar, for instance, which can be had almost for the carrying away—makes this a matter of little importance, in the first place; and in the second place, this waste can be eliminated by close regulation of the fuel supply. It is preferred, however, to run with an excess of oil, because this practice reduces, if it does not practically eliminate, the tendency to produce sooty deposits on the valves. When running with a maximum of fuel the exhaust is perfectly clear and smokeless; a very slight excess of fuel forms a carbon deposit, in the all too familiar way, while if there is a considerable excess most of it is condensed in the muffler and small detached particles burn quite slowly, because of the shortage of oxygen, and pass out with the exhaust in the form of sparks. This was plainly shown by running the engine with the exhaust muffler cut out and the gases shooting straight into the air.

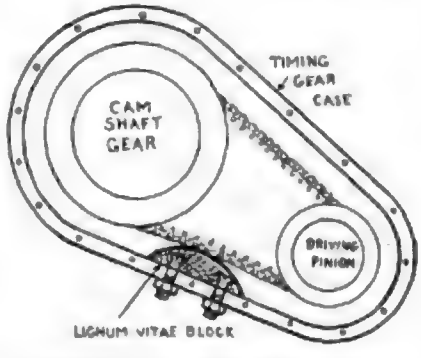
Cooling Induced by Oil Film.

The fact that there is no cooling system appears to be intimately connected with the the construction of the piston and with the lubrication. Tismer expresses the opinion that the average gasolene or gas motor cylinder is insufficiently lubricated. The close-fitting, sharp-cornered piston rings wipe off all the oil except a very thin film, he states, and this film is so light that it is very easily burned off. So he has made his piston ringless, arguing that in this way the film of oil on the cylinder walls will be practically undisturbed and of sufficient thickness, so that it cannot burn through in the time during which it is exposed to the heat of the burning charge. The comparatively thick film of oil appears to protect the cylinder walls. At any rate, they do not overheat. Neither is the exhaust very hot, for the bare hand can be held within ten inches of the open pipe without discomfort.

Tismer has not yet made accurate laboratory tests necessary to determine the exact power developed, amount of fuel consumed, and so on, though he expects to do so shortly. He has confined his efforts to the production of a system for burning the lowest grades of fuel with satisfactory results. The ability of the motor to run, jacketless, for long periods without overheating or becoming clogged up with carbon was tested by using it to run the machine tools in a shop for several months. It is not proposed to build special motors for the present, but to convert existing engines to use heavy fuel, and Tismer has work already under way on several engines.

Taking Up Wear in Silent Chains.

One of the results of the efforts of motor manufacturers to eliminate noise has been the adoption, in some cases, of chain drive for the timing mechanism, the chains being of the "silent" type. While the primary object of this arrangement is attained, at least while the chain is new, the fact that



METHOD OF ELIMINATING SLACK

all chains inevitably "stretch" or lengthen because of wear, sooner or later causes looseness which results in noise and, what is worse, inaccuracy of timing. The provision of means for taking up slack is by no means an easy problem, and in some cases it has been solved (?) by making no such provision, in which case the chain must be renewed when worn or else some scheme adopted to take up the slack.

Such an adjusting means is shown in the accompanying illustration; it is both simple and effective, and though it cannot be called a really permanent thing, it is good for about three months' wear under average conditions, and further slack as well as wear of the adjuster itself can be taken up by shimming up the block, which is of lignumvitae. This tough, wear-resisting wood answers the purpose better than metal because, while it has remarkable durability under friction, it does not produce a noise such as a metal block undoubtedly would when the chain links slide over it.

The illustration is self-explanatory and shows the chief point of advantage of the adjusting block—that is, that it can be used where there is very little clearance between the casing and the chain, and room does not exist for a more elaborate and perhaps more satisfactory and durable arrangement. So far as the matter of bringing the timing back to its original adjustment by this sort of take-up is concerned, it may be said that the tendency of wear, whether it is of the teeth of the chain or of the sprockets, is to cause lag or retardation in the timing; the adjuster, while it takes up the slack and prevents back-lash and noise, has no effect tending to correct the timing. On the other hand, it does not make matters any worse, for the lag due to stretch and wear remains exactly the same.

Search That Reveals Lighter Faults.

As a logical means of detecting faults in any electric lighting and engine starting system, there is everything to be said for, and nothing to be said against, systematic search. Commencing at the battery, its condition should be tested with a volt meter (never with an ammeter), following which the wiring between the battery and the generator and between the battery and the starting motor should be examined for frayed insulation, breaks or short circuits to the car frame. Short circuits, or faulty connection at the switches, next should be looked for, and last, for it is least likely to give trouble, the cut-out should be examined to make sure it is operating properly. Where a system is equipped with fuses to protect the line, it is obvious that they always should be examined first, for it is no easier to light the lamps or to start the motor with a burned-out fuse in the line than it is to run an automobile with the fuel turned off and the carburetter empty.

Vexations Caused by Lost Motion.

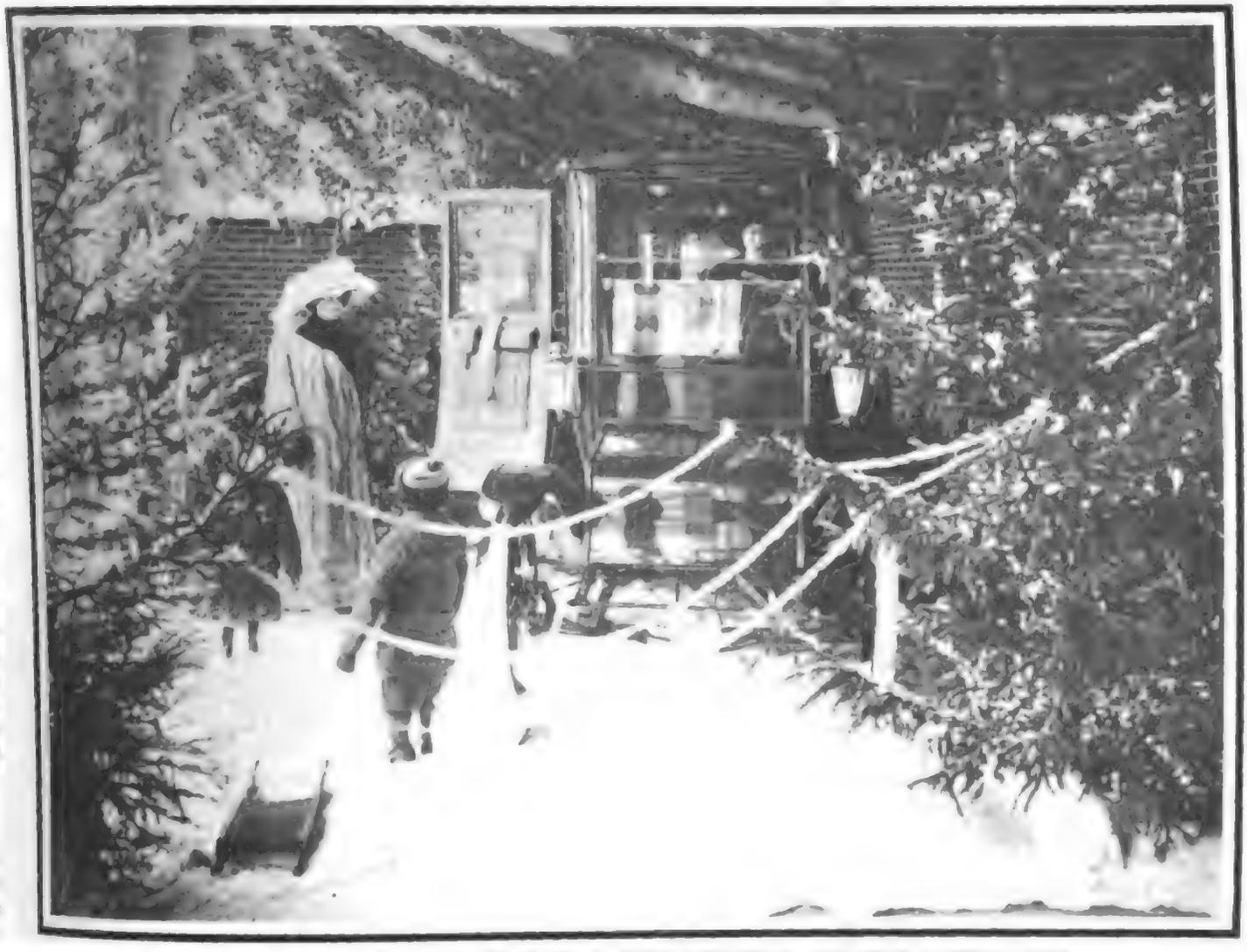
It is entirely possible for a carburetter to be in the best of condition, perfectly adjusted and well suited to the engine, and yet fail to respond as it should to the movement of the throttle lever—and with nothing the matter with the lever, either. Similarly, the magneto may be right in every way, and yet fail to have the usual and desired effect on the speed of the motor when the spark lever is moved.

The answer to the seeming puzzle is that there may be—and not infrequently is—something wrong in the connections between the levers and the things they are designed to operate. For instance, an arm may be slipping a little on a shaft or rod, so that only part of the movement of the lever is transmitted to the carburetter or timer; there may be a loose adjustment that permits slip; there may be an obstruction that stops the movement short of its full swing; or there may be a total disconnection somewhere.

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WINDOW DRESSING WITH A DEFINITE PURPOSE

Striking Display Arranged by a Detroit Manufacturer and the Suggestions it Conveyed—"Properties" Employed and Effect Obtained, Which, With Well-timed Advertising, Brought Immediate Returns.



GRINNELL'S CHRISTMAS WINDOW THAT COMMANDED ATTENTION AND SOLD ELECTRIC CARS

Effective as a window display may be, it is more powerful as a trade winner if it be but one part of a selling idea which has various supplementary features to help out the window display and in which the window display supplements the other directions of effort. A clever window dressing in connection with a Christmas selling idea was worked out by the Grinnell Electric Car Co. in its branch in Detroit, Mich.

The whole thought was to capitalize the idea of an electric car as an ideal Christmas gift and to this end a series of letters was mailed to a selected list of prospects and newspaper advertising was carried as a help to the conclusion on the part of the prospective buyer that a Grinnell electric would be overwelcome at the door on Christmas morning. All the way through was carried the idea of happiness in the family, and the advertising was essentially of the "heart appeal" type.

At this point enters the effectiveness of the window display. Having had brought to his attention through direct and newspaper advertising the joy and pleasure which an electric might bring to his family and himself, the prospect had it doubly stamped upon his mind when he appeared in front of the Grinnell store. In the windows he saw an electric emerging from the gate of a walled estate, one woman seated within the cozy interior, another standing in the snow outside with one hand upon the opened door and a snow-covered youngster debating whether he would rather give up the joys of playing in the snow with his new Christmas sled or ride with "mama" in her holiday gift.

Evergreen trees and shrubbery with snow-laden branches gave an aristocratic and wintry touch to the scene and accentuated the luxuriousness of the car. While the Grinnell idea was designed to catch the Christmas shopper, it may be none the less effective during the succeeding snowy and cold months, and that the idea was worth while is evidenced by the fact that the scheme brought the Grinnell branch one of the best months of business it ever experienced.

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1,022,754. Spring Wheel for Vehicles. Augustus F. Priest, Chicago, Ill. Filed May 19, 1910. Serial No. 562,119. (Semi-circular leaf springs form the spokes.) 3 claims.

1,022,775. Vehicle Spring. Frederick Denman, Highland Park, Ill. Filed Sept. 9, 1910. Serial No. 581,297. (End of half-elliptic leaf spring is attached to one end of a lever of the first order which operates in conjunction with a second similar lever attaching to the axle and a helical spring.) 6 claims.

1,022,801. Instrument for Indicating Speed and Running Time of Machines. Ralph Shipman, Sunbury, Pa. Filed Feb. 5, 1910. Serial No. 553,610. (Clock mechanism in conjunction with rate indicator). 10 claims.

1,022,803. Internal Combustion Engine. George A. Troutt, Detroit, Mich. Filed Feb. 10, 1910. Serial No. 543,023. (Means for injecting fuel into cylinder of a two-cycle motor.) 1 claim.

1,022,820. Starter for Internal Combustion Engines. George G. F. Boswell, Indianapolis, Ind., assignor of one-half to John L. Peetz, Indianapolis, Ind. Filed Feb. 6, 1911. Serial No. 606,695. (Hand operated starter.) 3 claims.

1,022,842. Detachable Rim for Resilient Tires. John William Hall and Cyril Baynes, London, England. Filed July 20, 1908. Serial No. 444,493. (Rim divided into sections which are clamped in place.) 7 claims.

1,022,856. Tire. Frank Marinics, Expedit, Pa. Filed Oct. 6, 1911. Serial No. 653,186. (Coiled springs enclosed in casing.) 1 claim.

1,022,864. Gas Engine. Robert S. Moore and James Lee Simmons, Washington, D. C., assignors to Gyro Motor Co., Washington, D. C., a corporation of Delaware. Filed Nov. 1, 1910. Serial No. 590,237. (Rotary cylinder motor with inlet valve positioned in the piston head and operated by a cam on the connecting rod.) 8 claims.

1,022,885. Resilient Wheel. Arthur Sherwood, Plantsville, Conn. Filed Jan. 24, 1911. Serial No. 604,447. (Helical springs enclosed in telescoping tubes which form the spokes, and rollers provided on the ends of the spokes to permit limited relative motion of the spokes and the rim.) 1 claim.

1,022,887. Harlow Orville Shockley, Darlington, Wis.) Filed Nov. 25, 1911. Serial No. 662,411. (Pneumatic hub.) 4 claim.

1,022,909. Universal Joint. William A. Whitney, Rockford, Ill. Filed July 30, 1908. Serial No. 446,055. (Ball and socket joint with steel balls housed in recesses formed between male and female members.) 4 claims.

1,022,913. Bolster for Vehicles. Roy J. Woodward, Fresno, Cal. Filed Sept. 11, 1911. Serial No. 648,822. (Inverted platform leaf spring which contracts, upon compression, with the arms of a supporting bracket.) 1 claim.

1,022,926. System and Apparatus for Starting Internal Combustion Engines. James C. Boyle, Calgary, Alberta, Canada. Filed March 20, 1910. Serial No. 551,610. (Valves for admission of compressed fuel to the respective cylinders electrically operated in conjunction with inlet and exhaust valves of the motor.) 7 claims.

1,022,966. Resilient Tire. Harry B. Montgomery, Harrisburg, Pa. Filed June 29, 1911. Serial No. 636,043. (Inflatable tube between wheel rim and felloe.) 1 claim.

1,022,990. Electric Igniter for Explosive Engines. Lewis E. Wegner, Nebraska City, Neb., assignor of one-fourth to Joshua Gilson, Nebraska City, Neb. Filed June 10, 1911. Serial No. 632,405. (Make and break mechanism.) 2 claims.

1,022,9991. Oiling System for Automobiles. Ernest M. White, Globe, Ariz. Filed July 29, 1911. Serial No. 641,299. (Constant level splash system.) 6 claims.

1,022,999. Automobile Shaft Coupling. John N. Bashaw, Lake Geneva, Wis. Filed Feb. 18, 1911. Serial No. 609,492. (Ball and socket universal joint with disk attached to ball operating in a slot in the socket.) 2 claims.

1,023,004. Gas Controlling and Lighting Apparatus for Automobiles. Allen G. Black, Springfield, Mass. Filed Feb. 17, 1911. Serial No. 609,225. (Friction lamp lighters operated from the dash.) 2 claims.

1,023,007. Automobile Door. Lucian R. Colbert, Massaponax, Va. Filed April 8, 1911. Serial No. 619,883. (Telescoping door for use with convertible bodies). 4 claims.

1,023,010. Spring Wheel. Harry E. J. Foerster, St. Louis, Mo. Filed Sept. 30, 1911. Serial No. 652,065. (Helical and leaf springs alternately disposed between wheel rim and felloe.) 1 claim.

1,023,016. Automobile Horn. Charles Raymond Heizmann, Reading, Pa. Filed Aug. 25, 1910. Serial No. 578,875. (Phonographic record produces the sound.) 4 claims.

1,023,026. Automobile Light Turner. Ward G. Moxley, Ravena, N. Y. Filed Aug. 26, 1911. Serial No. 646,231. (Levers attaching to steering knuckles afford means of causing motion.) 1 claim.

1,023,045. Automobile Truck. David [illegible] hanna Shipley, Joplin, Mo. Filed Oct. [illegible] 1908. Serial No. 457,731. (Six wheel truck with frame supported on a series of levers.) 2 claims.

1,023,050. Taximeter Control. Joseph D. Sulsona, New York, N. Y., assignor to Taximeter Control Co., a corporation of New York. Filed Jan. 10, 1910. Serial No. 537,208. (Electric signal system operated by taximeter, the entrance of a passenger, and a speed governor.) 12 claims.

1,023,122. Electric Lighting and Engine Starting System. Charles E. Bonine, Philadelphia, Pa. Filed July 7, 1911. Serial No. 637,334. (Single unit system with a compound wound motor-generator; ignition through vibrator coils.) 3 claims.

1,023,180. Ignition Apparatus for Hydrocarbon Engines. Milton Tibbetts, Detroit, Mich., assignor, by mesne assignments, to Packard Motor Car Company, Detroit, Mich., a Corporation of Michigan. Filed Apr. 17, 1908. Serial No. 427,634. (Means for supporting high tension wires above the cylinders.) 12 claims.

1,023,212. Starting Motor Vehicle Internal Combustion Engines. Charles William Mallins, Liverpool, England. Filed Dec. 1908. Serial No. 465,746. (Pulley clutched to crankshaft and operated from the seat by means of a chain.) 8 claims.

1,023,225. Muffler for Automobiles. Max Shlosberg, Chicago, Ill., assignor of one-half to McKenzie Cleland, Chicago, Ill. Filed June 22, 1911. Serial No. 634,7[illegible] (Two cones placed base to base with hole in the diaphragm which separates them for the passage of the gases.) 2 claims.

1,023,249. Friction Clutch. Nicholas W. Gales, Waterloo, Iowa, assignor to William Galloway Company, Waterloo, Iowa. Filed July 27, 1910. Serial No. 574,136. (Means for gradually engaging the friction surfaces.) 6 claims.

1,023,255. Anti-Skidding Device for Automobiles. Edmund Kron, Milwaukee, Wis. Filed Feb. 11, 1910. Serial No. 543,35[illegible] (Runner mounted so as to be effective only when the wheel sinks into snow or mud.) 6 claims.

1,023,344. Elastic Tire for Vehicle Wheels. Charles F. Waldman, Los Angeles, Cal. Filed Aug. 7, 1911. Serial No. 642,836. (Non-yielding tread supported by radial and diagonal helical springs in tension.) 2 claims.

1,023,397. Attachment for Carburetter. Hervey E. Rogers, New London, Conn. Filed June 15, 1911. Serial No. 633,2[illegible] (Device for mixing oxygen and air and supplying mixture to the carburetter inlet.) 1 claim.

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Luxury and Utility

combined in the

National

A woman can step directly from her home into her luxurious National closed car.

She finds it clean, warm and comfortable.

She touches one button to start the motor.

A touch on another button turns on the lights.

The entire mechanism of the car is under her immediate control; she need make no exertion or effort: her gown and coat and hands are not brought into contact with anything that may soil them.

In every way the National should appeal to a woman as being many times superior to an electric.

For her comfort and delight we fit the closed cars with a foot mat, umbrella holder, baggage compartment, speaking tubes, vanity box, mirror, flower vases, etc.

Five Models, Improved Series V, $2750 to $3400

Following are a few of the salient features of National cars:

Long Stroke (4 7-8x5) flexible and noiseless Motor with enclosed valves.

Left-Side Drive.

Center Control.

Gray & Davis Electric Starter, easily operated by simply touching a button with foot.

Gray & Davis Dynamo Electric Lighting System.

Bosch dual double Magneto.

12-inch Turkish Upholstery.

Electric Horn.

Adequate Baggage-carrying Compartment concealed in body but easily accessible.

Tire pump, integral part of the motor. Inflates a tire in three minutes.

128-inch Wheelbase.

Adjustable, ventilating and rain vision Windshield.

Multiple jet Carburetor.

Hoffecker steady-hand Speedometer.

Tire Carrier in rear.

Full-floating Rear Axle.

Easy-riding qualities unexcelled.

The Best Car To Own

National Motor Vehicle Company

Indianapolis, Ind.

Write Us For Proof

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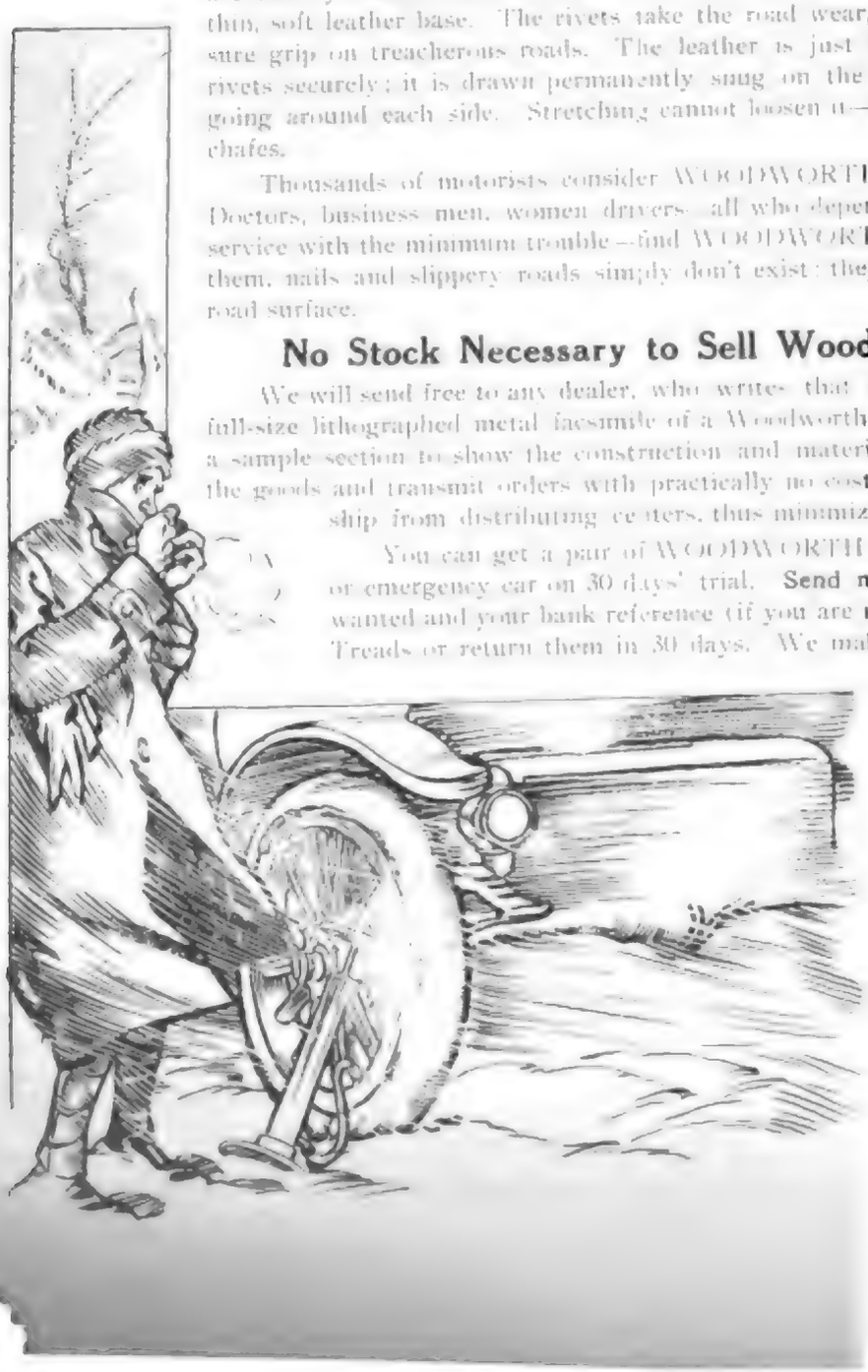
THE SALE YOU LIKE BEST

Is the One That Brings a "Thank You!" and a Repeat Order From Your Customer

THAT is the kind that hundreds of dealers are making now, with the tire coverings that prevent both skidding and punctures, yet do it **without** risk of heating and chafing the rubber!

Woodworth Treads





are exactly what a tire cover should be—a tread or surface of steel rivets in a thin, soft leather base. The rivets take the road wear, arrest nails, and afford a sure grip on treacherous roads. The leather is just thick enough to hold the rivets securely; it is drawn permanently snug on the tire by stiff side springs going around each side. Stretching cannot loosen it—and a snug covering never chafes.

Thousands of motorists consider WOODWORTH TREADS indispensable. Doctors, business men, women drivers—all who depend on regular and punctual service with the minimum trouble—find WOODWORTH TREADS a boon. For them, nails and slippery roads simply don't exist: they are always ready for any road surface.

No Stock Necessary to Sell Woodworth Treads

We will send free to any dealer, who writes that he will pay expressage, a full-size lithographed metal facsimile of a Woodworth Tread, with literature and a sample section to show the construction and materials. Thus you can show the goods and transmit orders with practically no cost to offset your profit. We ship from distributing centers, thus minimizing express charges.

You can get a pair of WOODWORTH TREADS for your renting or emergency car on 30 days' trial. Send **no money**—simply the size wanted and your bank reference (if you are not rated)—and pay for the Treads or return them in 30 days. We make this offer to enable you to tell your customers from experience what WOODWORTH TREADS will do, and how totally different they are from other so-called "protectors."

We guarantee WOODWORTH TREADS to both dealer and user. But we can't tell all about them here. Write today for full particulars of their construction and use, and a sample section of the Tread showing how it is built to do exactly what we say.

Leather Tire Goods Company
Niagara Falls, N. Y.

New York Store, 1608 Broadway

You didn't stick to this, did you?



or this?



You jumped at this



and grabbed at this



Yet why stick to this



When you need only do this



and always be sure of RESULTS—with

GLBA

Storage Batteries

For Lighting and Cranking

Use the Class A GLBA Battery with an Electric Lighting Generator
Use the Class B GLBA Battery with an Electric Self-Starter

Write us for full information

Willard Storage Battery Company

New York Branch—136 West 52d Street
Detroit Branch—1191 Woodward Avenue

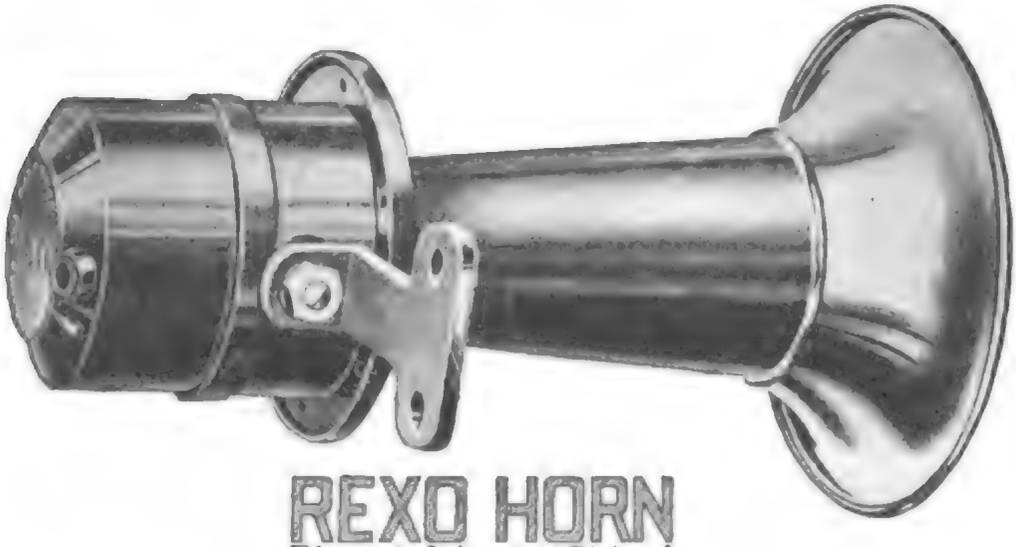
CLEVELAND, OHIO

Chicago Branch—2241 Michigan Avenue
San Francisco Branch—243 Monadnock Bldg.

Depots in All Principal Cities in the United States, Canada and Mexico

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Elyria-Dean
TRADE MARK



REXO HORN
Electric Warning Signal
GUARANTEED

$8.00

The Rexo Adds Value to Motor Cars

The time has really come when the accessories that make up the equipment of motor cars materially influence the buyers of automobiles. Every prospective purchaser looks carefully and critically at the little things that either increase or lessen the convenience, the safety and the satisfaction to be derived from the use of a car.

Manufacturers have adopted the Rexo as standard equipment because it is recognized almost universally by car buyers as the most simple, most trouble-proof, most effective low-priced horn on the market.

Rexo Horn Advantages

This electric warning signal operates from any 6-volt battery and the current required is small, so that maintenance is very low.

It gives a clear, loud, abrupt signal, which is instantly responsive to a touch of the button, conveniently located on the steering wheel or other handy place. Its operation is equally as positive in winter as in summer, as there is no oil or grease to congeal.

The Rexo requires no care or attention, except perhaps once a year to overcome the season's wear. The slight adjustment necessary is easily made with an ordinary screwdriver.

Rexo qualities have made it the most popular and widely-used single tone electric horn on the market.

We also manufacture the Tuto, a very high-grade, two-tone horn, at $25, and the Tutoette, a smaller two-tone horn, which sells for $17.50.

Elyria-Dean Products Manufactured Only By

The Dean Electric Company

501 Olive St., Elyria, Ohio, U. S. A.

San Francisco, Cal. **Kansas City, Mo.**

"Look for Elyria-Dean where quality's seen"

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Elyria-Dean
TRADE MARK



Elyria-Dean Speedometer

Simple and Always Accurate

The Elyria-Dean Speedometer has the most modern features of any speed measuring device on the market.

It has real speedometer value, easy reading, steady hand, permanent accuracy, lasting strength, neat design and handsome finish.

The dial is black with white markings; the case is beautifully finished in baked black enamel with nickel trimmings.

The hand is steady and shows the speed at a glance by its position. No need of laboriously deciphering the figures or markings as in other speedometers.

The cup is shaped so that a long scale of uniform division is obtained direct. No need to guess at the reading or doctor the scale.

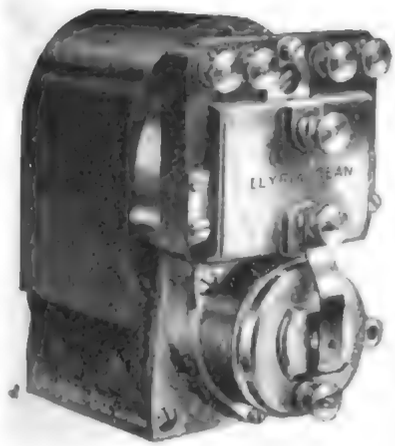
The Odometer—Geneva type—is exceptionally reliable. Trip scale reset to the tenth mile, which **facilitates following guide book markings.**

It always adds mileage whether the car goes forward or backward, or whether shaft is driven from right or left hand wheel.

The Elyria-Dean Speedometer operates on the unvarying principle of direct centrifugal force. No compensating gears, springs or other parts to hamper or reduce **accuracy.**

The accuracy is unaffected by weather conditions. It registers the same in winter and summer, in rain or in shine. No regulation or compensation required.

This elegant instrument is the proper equipment for the highest-priced and most luxurious motor cars. See it and other Elyria-Dean Products at the Chicago Show.



Elyria-Dean Ignition System

This is the new system which has created such favorable results on modern power plants. It gives a new breath of life and extra "ginger," which is so much sought for by the car purchaser.

The high frequency spark differs from all other ignition sparks, as it is oscillatory in character, 5,000,000 to 1,000,000 cycles per second.

It ignites the gas in a different manner, by ionizing, embracing a larger volume and giving more rapid and complete combustion, even of poor mixture.

Wide spark plug gaps are permissible, 1-16 to 3-32 inch and the disruptive action of the spark prevents fouling of the plugs. Under average conditions, plugs never have to be removed, unless for mechanical breakage.

High cylinder pressures have less effect on this spark than on the other ignition sparks.

It allows the lowest of motor speeds without missing—running on the magneto current.

"Self-starters" are made successful on magneto ignition, as effective sparks are obtained at very low speeds, below 50 R. P. M.

All wiring carries low voltage currents, as the little resonator coils at the plugs step-up the pressure just where it is used. This obviates leakages and the maintaining of high insulation in the magneto, switch and connecting wiring.

It is a perfect product, the outgrowth of the many thousands of successful High Frequency Systems which have been marketed by the High Frequency Ignition Coil Co., of Los Angeles. Many of these systems have been in use for five or six years, and are still giving satisfactory service.

Elyria-Dean Products Manufactured Only By

The Dean Electric Company

501 Olive St., Elyria., Ohio, U. S. A.

San Francisco, Cal. **Kansas City, Mo.**

"Look for Elyria-Dean where quality's seen"

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Dealers



The big tire business of the future will be Dunlop business

The GENUINE DUNLOP (Straight Side) TIRE

is destined to become the universal tire

Car owners, dealers and manufacturers are everywhere turning to the Genuine Dunlop Straight Side Tire.

The 600% increase which has taken place in our Dunlop sales during the past year is an indication of the certainty of this trend.

The trade in general have come to realize what tire experts have long known—that the Dunlop is the ideal type of motor car tire.

It is the easiest tire in the world to put on or take off and it is absolutely guaranteed against rim-cutting during the life of the tire.

It possesses the superior strength and durability to be found only in four-factory co-operatively-built United States Tires. In fact it possesses every point of advantage to be found in any other tire, and in addition has exclusive advantages to be found in no other tire.

But bear in mind, the Genuine Dunlop Straight Side Tire is made only by the

UNITED STATES TIRE COMPANY

Makers of the famous Nobby and Chain Tread Tires (made in three styles, including the Dunlop)

NOTE: As always the guarantee of the United States Tire Company attaches to its tires when filled with air at the recommended pressure only

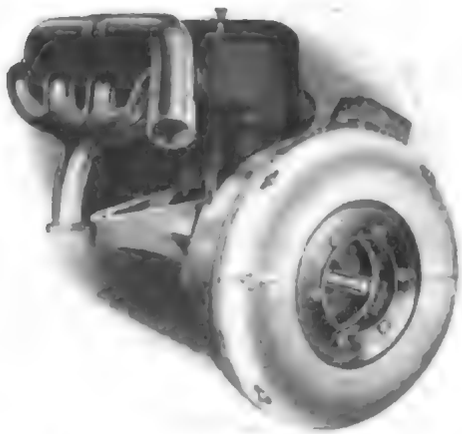
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USL

Boosts Sales by Starting Engines Right

USL
THE UNITED STATES LIGHT AND HEATING CO.

Electric Starter and Lighter

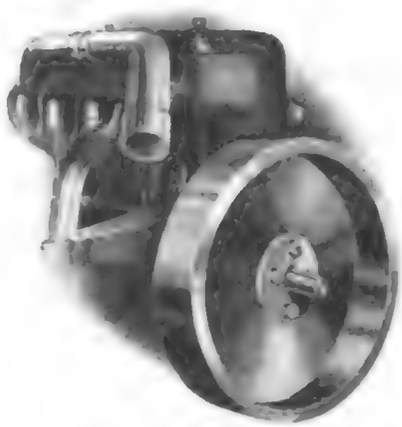


U-S-L Motor—Generator Self-Contained in Fly-Wheel Space

Takes the Place of the Fly-Wheel !

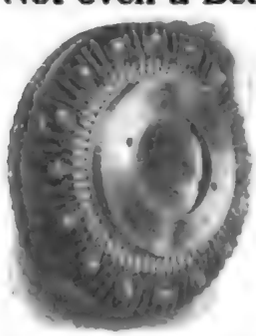
Cars with U-S-L

Rambler
Overland
Bergdoll
Garford Six
Edwards-Knight
Moyer



Ordinary Fly-Wheel

No Gears **No Chains**
No Clutches **No Noise**
Not even a Bearing to oil



U-S-L Fly-Wheel Armature —only moving part

High Speed

150-400 Rev. per Min. means gas pulling vacuum on cold mornings and instant magneto action.

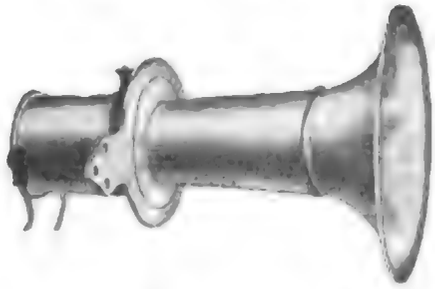
This is a proposition for Car Manufacturers only. When the Car Builder adopts U-S-L he stops using cast-iron Fly-Wheels—instead, he bolts the U-S-L Armature to the Flange of the Crank Shaft. This makes a direct connected Electric Motor and Generator combined.

U-S-L would add a Selling Point to Your Car

The U. S. Light & Heating Co. *General Offices*: 30 Church St., New York. *Factory*: Niagara Falls, N. Y.
Branch Offices and Service Stations: Chicago New York Boston Cleveland Buffalo San Francisco Detroit St. Louis

USL

NEWTONE SUPERIOR

$10  **$10**

The First Efficient Motor Horn to Sell at a Popular Price

A warning note, pleasing yet penetrating, with wonderful carrying power

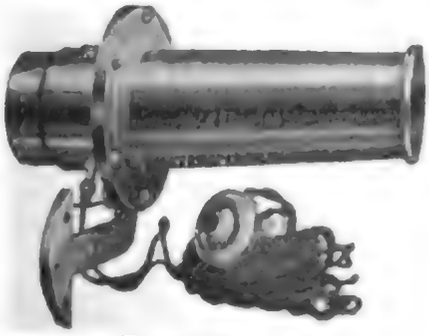
We make a better horn for less money than can possibly be produced elsewhere

WHY?

We are the largest Auto Horn Makers in the World.
We supply over 75 per cent. of the trade with different types of horn.
Our factory is the largest. Our machinery is of the best.
Our facilities in every way are superior

In the past eight years we have made and sold over *One million two hundred and fifty thousand horns* of different types and sizes.
This year we will produce over *One hundred thousand "Newtone" horns* alone.

Every detail makes for *EFFICIENCY and ECONOMY*



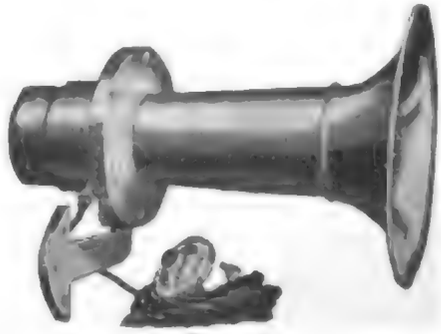
Torpedo Type

TORPEDO TYPE

and

TYPE M

Price $20



Type M

Price and Quality Rule—Always

Write for Catalogue

AUTOMOBILE SUPPLY MANUFACTURING CO.

220 TAAFFE PLACE BROOKLYN, N. Y.

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THE JUNIOR LONG HORN



Is the Biggest Eleven Dollars Worth Ever Put On A Car

$11

That's What our DEALERS say.

That's what YOU will say after you have been demonstrating and selling it.

If you will take up our proposition, we will show you a short cut to quick and profitable sales.

This Junior Long Horn

is like its big brother in all but price and size.

Operates mechanically by hand or elbow pressure.

Has a loud, commanding voice.

Volume of sound regulated by pressure.

No batteries---no switches.

Cannot break down or wear out.

Never varies in volume of sound.

Installed in five minutes.

Doesn't cost a cent to operate.

Retail price $11.

Your discount worth knowing about.

Now, it's up to you to show your trade the Long Horn—a demonstration means a sale to every one who knows the trouble, expense and inefficiency of even the highest priced signals that are not mechanical. Write today.

The G. Piel Company 14th Street and Boulevard LONG ISLAND CITY, N. Y.

Attaching Rooms: 51 West 63rd St., corner Broadway, NEW YORK CITY.

Boston: 109 Massachusetts Ave.
Buffalo: 20 Goodrich St.
Chicago: 1322 Michigan Blvd.
Denver: 15th and Curtis Sts.
Philadelphia: 1427 Vine St.
San Francisco: 530 Golden Gate Ave.
Seattle: 1220 So. Olive St.
Portland: 329 Ankany St.
Detroit: 510 Majestic Bldg.

Buffalo Electrics

The Best of America



SINGLE REDUCTION DIRECT SHAFT DRIVE

THERE is no finer piece of mechanism than the human body. All mechanics are based on a study of how the human body does things.

The power plant and driving mechanism of every good motor car should be arranged as the athlete arranges his members—crouched, waiting for the starter's signal—in a straight line.

Think of eager get-away; think of efficient running; extra effort—as when you speed up a little, or climb a hill. Single Reduction Direct Shaft Drive, especially the kind in Buffalo Electrics, acts just as the human body would act under similar conditions. We obtain even a faster get-away than gasoline cars.

Another advantage of Buffalo Electric Shaft Drive is its economy in current used. There is no noise. Every strain balances and works to your benefit.

BUFFALO ELECTRIC VEHICLE CO.

Factory and General Offices, Main Street

BUFFALO, N. Y.

Exhibit at Prominent Shows

Send for Descriptive Booklet

DEALERS

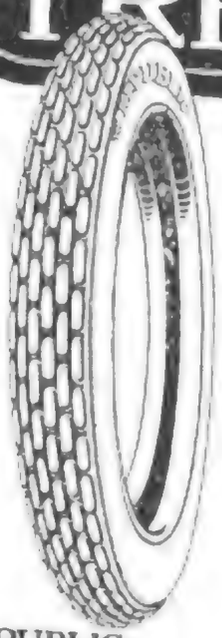
In the make-up of Buffalo Electrics you will find each element rounds out and helps every other element; producing a perfectly balanced electric.

Dealers of good standing are invited to investigate the merits of a Buffalo Electric Agency. Some very good territories remain unassigned.

The Buffalo Electric pleasure car line includes a runabout, coupe and forward drive brougham; also commercial trucks, from 1,000 pounds to 2 tons. Write for full particulars.

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REPUBLIC STAGGARD TREAD TIRES

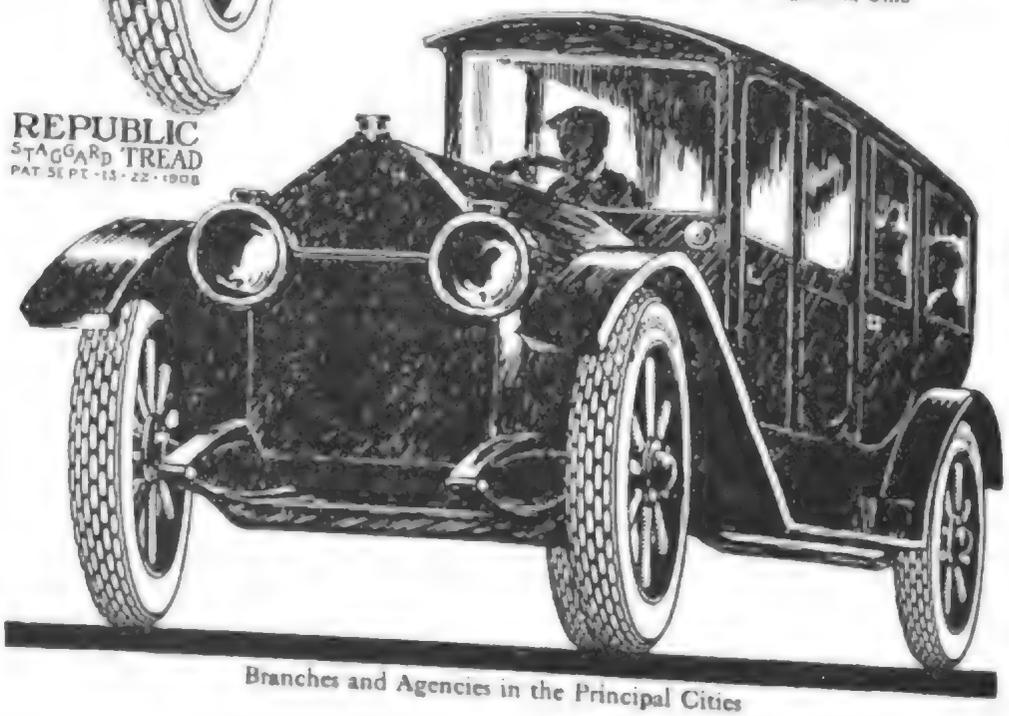


Limousines demand sturdy, skid-proof tires

The extra weight and top-heaviness of the average enclosed car put an unusual strain on tires. The tending to skid is more pronounced than in any other type of car.

This year, equip your enclosed car with the original, effective non-skid tire. You can feel safer on wet, slippery pavements, and you can rest assured that the extra thickness of the Staggard Tread will yield you extra mileage and freedom from tire troubles.

THE REPUBLIC RUBBER CO., Youngstown, Ohio



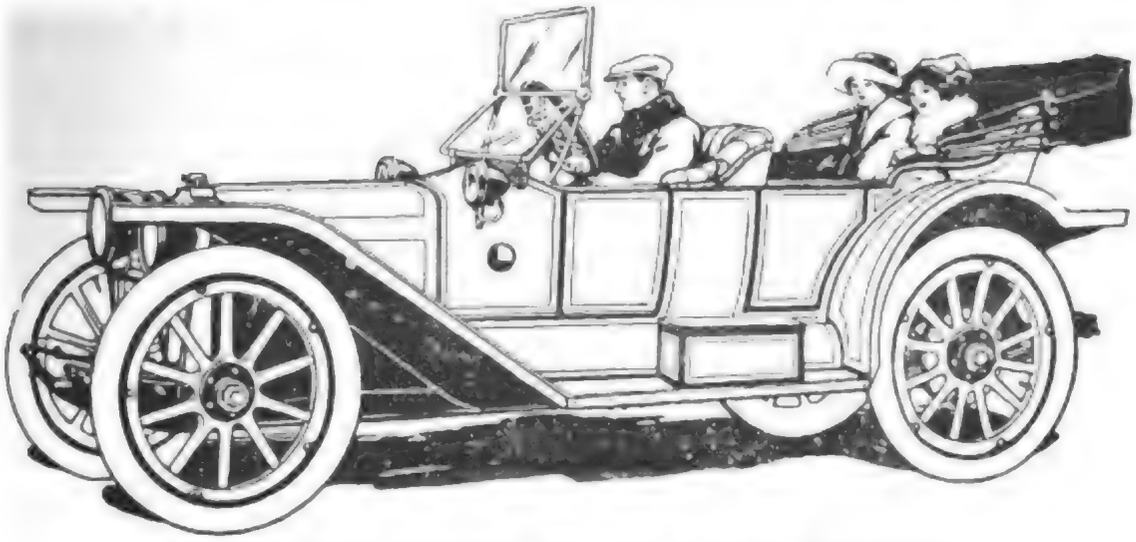
Branches and Agencies in the Principal Cities

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Electrically Lighted

AMERICAN UNDERSLUNG

Electrically Started



The "American Tourist" (Type 34-A) $2,350 Complete

Comfort!

YOU can drive an "American Underslung" over a series of two-by-four timbers at fifteen miles an hour and the plane of the underslung frame will not be perceptibly disturbed.

The underslung construction permits greater riding ease than that found in any other automobile. In estimating the riding comfort of a car, not only the jolts and jars of the road must be considered but also those of the car itself.

The "American Underslung" design permits no sidesway—and no shocks on the frame. You can tour one third more miles in a day with less fatigue. And you can cover the same distance at from 10 to 20 miles greater speed.

The big wheels and the peculiar spring suspension adaptable only to the underslung design increase many times the fun and joy of cross country touring.

Compare the stability of a pail of water carried above the head and that by the side. This properly contrasts underslung design with that of the conventional overhung.

Write us today for our interesting book, "The Advantages of Underslung Construction."

The "American Scout" - - - $1,475 Complete
The "American Traveler" - - $4,500 Complete
(Improved Electric Starter with Tourist $150 Extra)

Please Address Dept. E

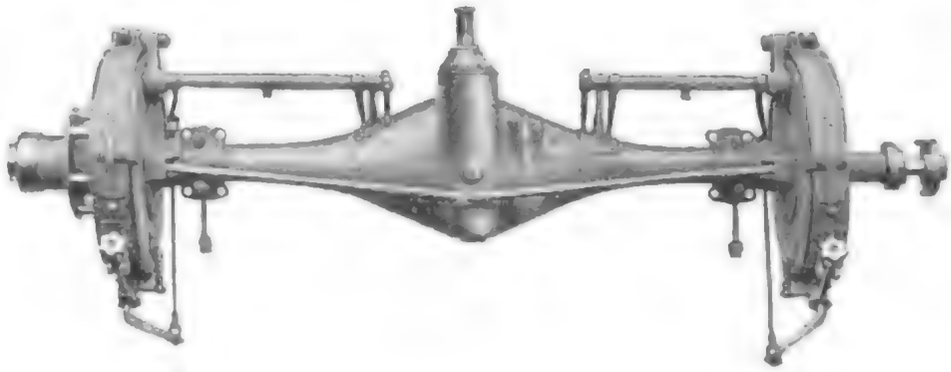
American Motors Company, Indianapolis, Indiana

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American American

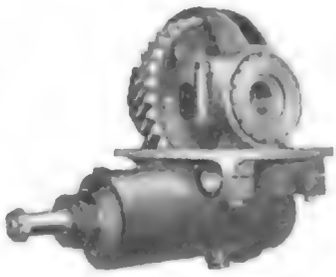
American Axles

Having Least Friction Give Most Power



Whether your motive power is electricity or gasoline, your problem is one of power transmission rather than power creation. *American Axles* least obstruct the flow of power from your motor to your wheels.

After an electric car leaves the garage, no further addition can be made to the charge which its batteries carry. *American Axles* because of their minimum of friction, perfect construction and highest quality workmanship, will give you the maximum mileage of which that charge is capable.



Our position in this industry allows us, we believe to speak with authority to every prospective car owner on this important subject. We designed and built the first Bevel-Drive Axle used by an electric car in America. Today 80 per cent. of the electrics in this country use *American Axles*.

Only in *American Axles* can you have the choice between the highest developed type of bevel gears and the famous Lanchester-Daimler Worm Drive.

We hold the exclusive American rights as axle manufacturers of the Lanchester-Daimler Worm Gearing, through the Warner Gear Co., of Muncie, Ind.

THE AMERICAN BALL-BEARING CO.

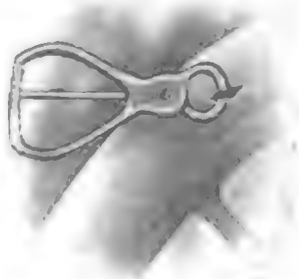
Edgewater Park & L. S. & M. S. Ry. CLEVELAND, OHIO

American

GILMER TIRE-REPAIR PLIERS



Dealers---If You Sell Tires, Accessories, or Complete Cars ---Read This Advertisement



A popular and fast selling accessory such as GILMER TIRE REPAIR PLIERS means everything to the wide-awake DEALER. Our product is advertised extensively in all leading AUTOMOBILE publications. Inside of twelve months we have created a demand which taxes our present capacity of 10,000 complete sets per month. To date we have barely scraped the surface; this is proven by the fact that over 50 per cent. of our orders come from territories wherein we have already shipped our PLIERS.

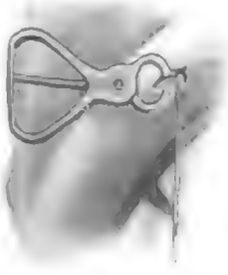
Every Motorist is a possible buyer. There is no room for doubt on a GILMER PLIER sale. They actually protect his pocketbook, for in eliminating a large part of his TIRE EXPENSE we remove the one serious objection to motoring.

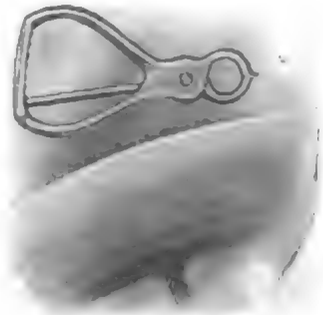
IF YOU SELL GILMER TIRE REPAIR PLIERS they will put you in touch with hundreds of new customers. Your only effort is to DELIVER THE GOODS. We will send the buyers to you, not an occasional chance sale but a steady stream of live ones, the kind that make for GOOD BUSINESS.

Don't Worry About Your Profit---Gilmer Dealers Are Making Money Fast

The retail price of $1 for Pliers and Cleaner means quick sales. No one will hesitate on price—for you can show them in one minute that the investment will be saved twice over in the first week.

If you are not visiting the New York or Chicago Shows send for DEALER proposition. Our selling plan-via-the DEALER was conceived with the idea of making GILMER PLIERS the leading accessory of the industry. We will guarantee to show you a modern money making connection—plus—an intelligent way to get in close touch with ALL the CAR OWNERS in your territory.





G. WALKER GILMER, Jr.

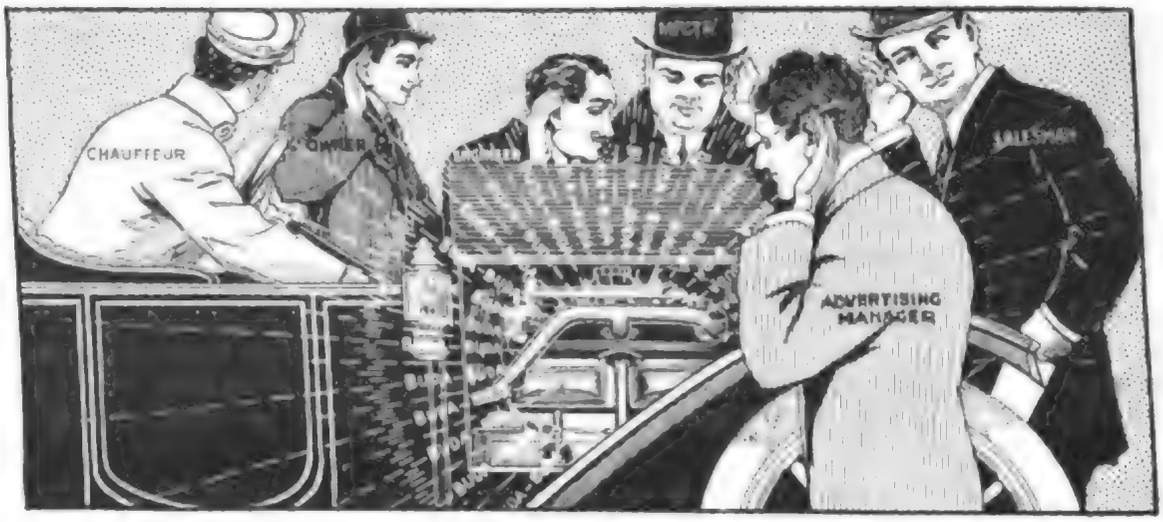
52 NORTH 6th STREET. PHILADELPHIA, PA.

GILMER TIRE-REPAIR PLIERS

GILMER TIRE-REPAIR PLIERS

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LISTEN! Buda—the Silent Sales Manager—Is Talking Now



Many a wise manufacturer has learned to "let the BUDA do his talking" because he realizes that the

Pleasure Cars:

Hudson Motor Car Co.
Michigan Motor Car Co.
Henderson Motor Car Co.
Lenox Motor Car Co.
Schacht Motor Car Co.
Spaulding Mfg. Co.
Croxton Motor Co.
Nova Scotia Carriage and Motor Car Co.
Miller Motor Car Co.
—and others.

BUDA MOTOR

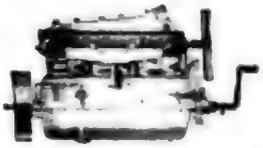
Trucks:

Service Motor Car Co.
Bowling Green Motor Car Co.
Durant-Dort Carriage Co.
Hewitt-Ludlow Auto Co.
Tiffin Wagon Co.
Brantford Motor Truck Co.
W. Landshaft & Sons
Harvey Motor Truck Co.
Hoerlburt Motor Truck Co.
Schacht Motor Car Co.
Chicago Pneumatic Tool Co.
Lord Baltimore Motor Car Co.
Rosenmer Motor Truck Co.
U. S. Government and others.

"is the part that sells his car"

He knows that all the rest of the sales force are merely intermediaries. *When you cock your ear to the motor you get the story direct.* It's like going in to have a word with the "old man" himself. No noisy boo...oast of arrogant claims, no genial generalities. Just a quiet reminder that when you buy a *car* you are really buying a MOTOR *with trimmings*. Better to realize that *now*, than wish you *had* when the repair bills come in and engine dependability has gone.

That manufacturers have been impressed with such exclusive BUDA advantages as its "get-at-ableness"—its special oiling device, etc., is evident from above partial list of manufacturers to whom we've sold motors.



Model "SS" Buda "Little Six"

The Buda "Little Six"

(3¾ in. Bore x 5½ in. Stroke)

Will be ready for delivery by April first and is a product worthy of the Company which was the Pioneer of the "Cast-in-Block" method in U. S.

SPECIAL NOTICE: We have recently opened a new department for the manufacture of transmissions for electric self starters and forged steel ring gears for fly wheels. We invite inquires for this class of work.

1913 SPECIFICATIONS:

Model "T" Motor, 4½x5½ Model "Q" Motor, 3¾x5½
Model "U" Motor, 4½x5½ Model "M" Motor, 5x5½

Long stroke. Enclosed valves. Noiseless timing gears. Self-contained positive oiling system. Extra large valves and bearings

Send for Special Bulletin to

BRANDENBURG & COMPANY

1108 South Michigan Avenue, Chicago 57th and Broadway, New York City Ford Building, Detroit

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The Cole Franchise is the same to you as money in the bank

No matter what car you represent, you owe it to yourself to investigate the meaning and significance of this big progressive new idea. We will merely hint here that it means the final solution of the **"dealer and factory problem."**

How? That is what we will explain to you, if you so desire.

When a distributor or a dealer "hooks up with **Cole,"** he does not get a mere piece of paper; he gets a gilt-edged salable **franchise** worth money to him the instant that the document is signed.

This franchise represents a considerable commercial value, and is good as collateral at the bank.

These Cole Franchises are not distributed promiscuously.

When we issue a Cole Franchise, we realize that we are engaged in a serious procedure—one that will affect us and you for a period of years. We assume certain serious responsibilities. It is not a mere incident in the day's work. We are as careful about the issuance of the Cole Franchise, as we would be about signing any other official document.

But, at that, the fact that the Cole Motor Car Company is about to again enlarge its production, might make it possible for you to obtain the Cole Franchise in your territory. We know you would not impose on good nature by opening negotiations with us unless you were able to do justice to a big progressive marketing enterprise.

We will take it for granted that you know the type of representation we must have, and will explain, if you so desire, just what is signified by the term **Cole Co-operative Franchise.**

Granted that you are a real live dealer with real live ambition to succeed, we will soon get the coupon from you. Here it is. Fill it out, and without the slightest delay or obligation on your part, mail it in.

Cole Motor Car Company

Indianapolis

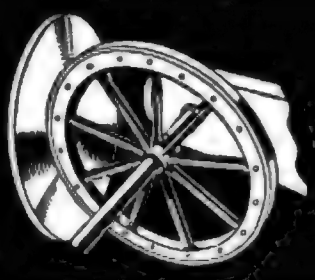
COLE MOTOR CAR COMPANY
Indianapolis, Indiana
(Department K)

Tell me about the Cole Franchise—what it will mean to me—I am willing to listen—so let me hear from you by return mail.

Name .....

Address .....

Digitized by Google



The Gearless Transmission!

For ten years this simple, reliable car has been growing steadily in popularity. Today it is found giving perfect service in every section of the country. It offers advantages which are impossible in the gear car—and these advantages mean the very utmost in service and satisfaction for you.

A Cartercar Will Save ⅓ - ½ Your Tire Bills!

There are no jerks or jars in starting or stopping—and this means that much of the hardest wear on the tires is eliminated. Tires are the big item in the upkeep expense of the ordinary car.

And you know that this smooth, easy running must mean remarkable comfort for the passengers. Then, too, the very deep upholstering and resilient springs make the Cartercar as comfortable as any car can possibly be.

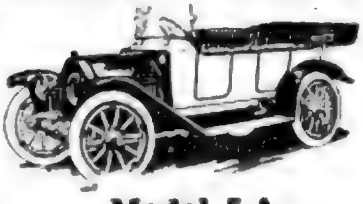
Think of Climbing 50% Hills!

The great economy of power secured by the gearless transmission makes it possible for the Cartercar to easily climb the steepest hills and to simply play through deep mud and sand. No gear car can offer such service.

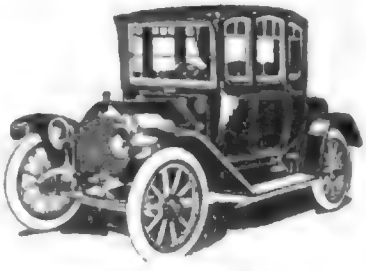
Another advantage is the unlimited speeds. And all with a simple one lever control. Compare this with the four of the gear car.

Of course, all Cartercars are Electrically Started and Lighted. Both of these operations are controlled by a little knob on the front of the driver's seat. This and all other equipment is included in the regular prices.

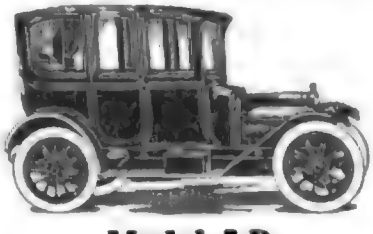
Do you want a car for dependable service—all the time? Then consider the exclusive advantages offered by the Cartercar. Catalogue now ready.



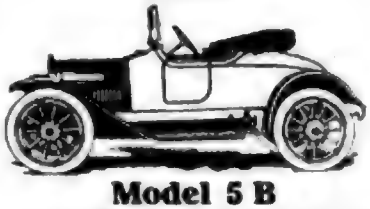
Model 5 A
Five Passenger Touring Car—With Electric Starting and Lighting System and Complete Equipment
$1700



Model 5 C
Colonial Coupe—Three Passengers—with Electric Starting and Lighting System and Complete Equipment—
$1900



Model 5 D
Five Passenger Sedan—With Electric Starting and Lighting System and Complete Equipment
$2000



Model 5 B
Roadster—With Electric Starting and Lighting System and Complete Equipment
$1600

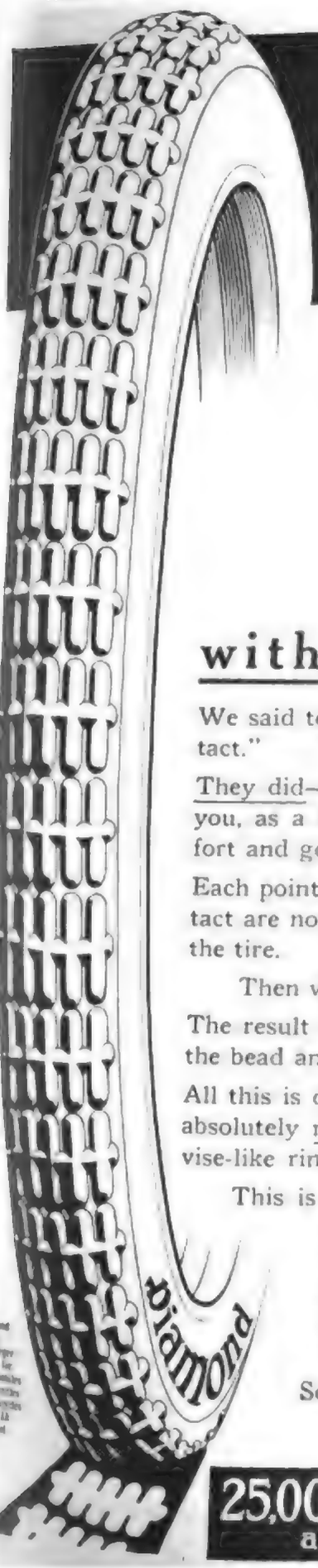
See Them at All the Big Shows!

Cartercar

Cartercar Company
Pontiac, Mich.

Branches: New York, Detroit, Chicago, Kansas City, Atlanta

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Tire bill payers!

You have demanded a vise-like rim-grip - with no cutting or breaking above the rim-and here it is

Diamond

Vitalized Rubber

{No Clinch} Tires



with Perfect 3-Point Rim Contact

We said to our Engineers: "You must build us a tire with perfect 3-point rim contact."

They did—and now we offer you a sane, sensible, No-Clinch tire that will appeal to you, as a hard-headed, shrewd tire buyer—a man who insists on easy riding comfort and good liberal mileage.

Each point of rim contact in a tire is a point of support. Where the points of contact are not perfect, undue pressure is brought to bear at an unsupported point of the tire.

Then what happens?

The result is a terrific strain on the tire that results in rim troubles, breaking above the bead and separation of the tread from the carcass.

All this is overcome in the "Diamond" because the three points of rim contact are absolutely mechanically perfect—the annealed steel cabled wire bead holds with a vise-like rim-grip.

This is only one Diamond advantage.

You get additional More Mileage advantage without extra expense in the Diamond Vitalized Rubber—a scientific combination of pure, lusty, young rubber and a toughening compound—nothing inferior in rubber, fabric or workmanship—the No-Pinch Safety Flap inner tube protector—and, if you desire, the now famous Safety (Squeegee) Tread--made to fit all types of rims.

So this time specify "Diamonds"—you can get them at any of the

25,000 Diamond Dealers
always at your Service

BE A DIAMOND DEALER

If you are not a Diamond Dealer—now is the time to get in line. There is a Diamond Branch near you—get in touch today.

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C. A. Mezger

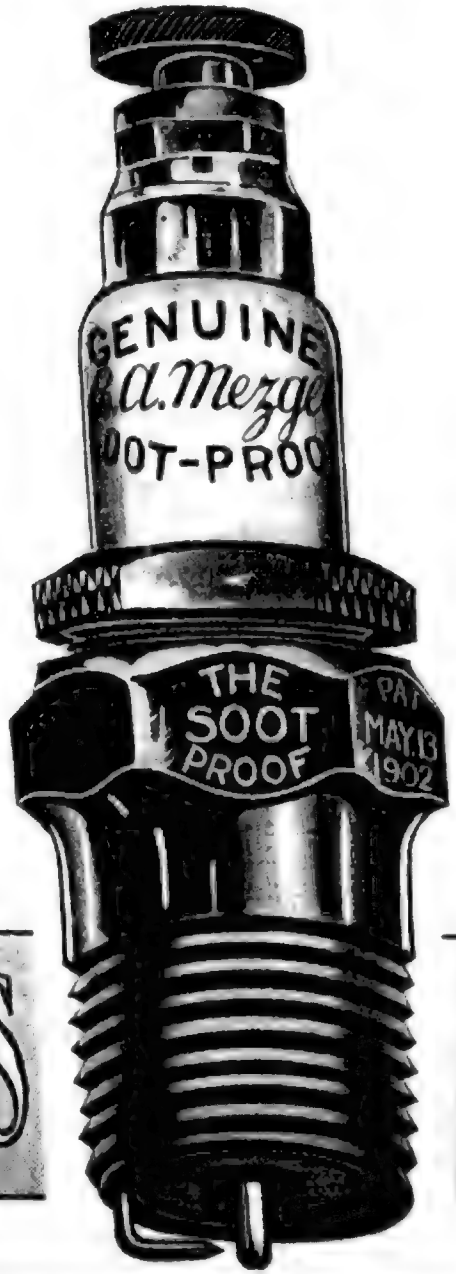
"SOOT PROOF"

SPARK PLUGS

We Are Advertising

Mezger Soot Proof Spark Plugs

in the Leading Automobile and Motor Boat Journals



We are using pages and double pages — and running until every car and boat owner will be wise enough to buy Mezger Soot Proof Plugs.

DEALERS

Read the Big Message

How About Dead Stock in Spark Plugs?

You may have such a losing investment—Plenty of dealers have.

It's the logical result of defective products—many brands that do not give service, even if you *do* sell them on the maker's word.

DEALERS

We are going to help you to sell Mezger Soot Proof Spark Plugs by giving your trade the best plug on the market — and by giving you advertising service on a scale never attempted by any manufacturer in this line.



Mezger Soot Proof Spark Plugs are made by one of the oldest spark plug makers in America.

They have stood the test of years —long, hard and consistent service.

Through their self advertising they have multiplied into

Millions Now in Service

and they are giving perfect satisfaction to tens of thousands of motorists—simply because they cannot short circuit, leak or break down.



Your trade can pay more for Spark Plugs, but no matter what the price, they cannot buy more uninterrupted service or longer life.

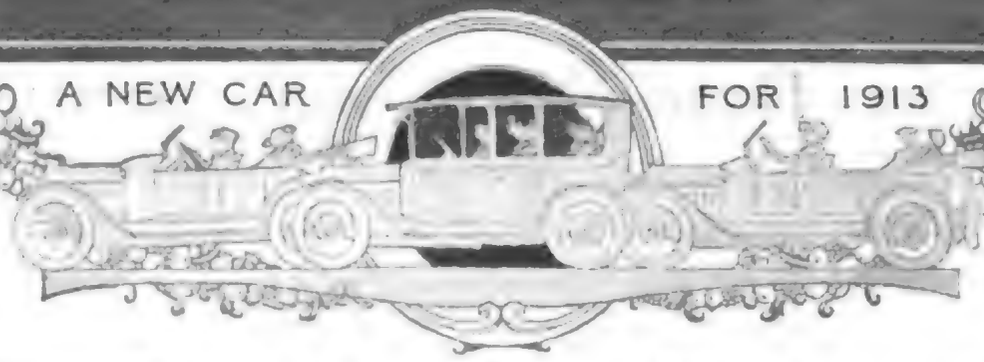
We are going to prove that it will be to your advantage to handle Mezger Soot Proof Spark Plugs exclusively.

Write today for our proposition. Get our booklet telling why these plugs have made and held a reputation second to none.

C. A. MEZGER CO., Inc., 15 Canal Place, New York

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A NEW CAR FOR 1913



EDWARDS KNIGHT

HAVE you ever thought what a superior motor car would result from a combination of the excellences and elimination of the weaknesses of all leading **European** and **American** cars?

WE have been thinking along these lines for a long time and our engineers have been carefully investigating the leading cars of the World.

THEY have been adopting, eliminating, inventing—and the result is the **EDWARDS-KNIGHT**. The specifications will convince you that this car merits **personal** investigation.

EDWARDS-KNIGHT ENGINE—Silent, powerful, flexible, economical. Shaft Drive with Worm Gear. Electric Lighting and Starting Device. Unit Clutch and Transmission. Power Tire Pump. Bodies of most graceful lines and perfect finish. Cantilever Springs and Wire Wheels make it the easiest riding car in the World.

Touring Car	$3500	Roadster	$3500
Torpedo (4 Pass.)	3500	Speedster	3500
Limousine	$4600		

Every Car is Fully Equipped

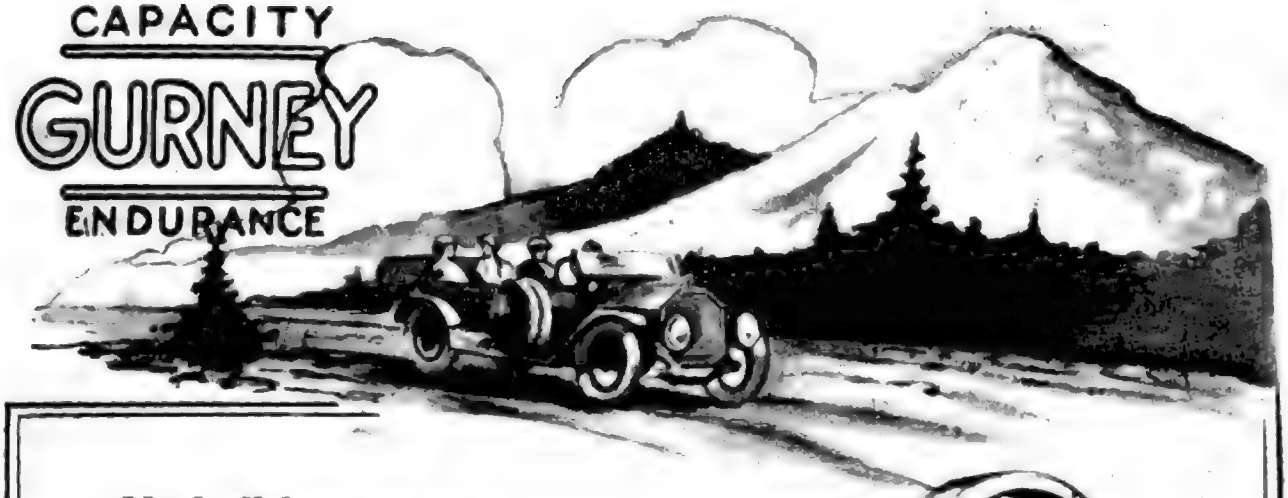
EDWARDS MOTOR CAR COMPANY
1790 Broadway, New York City
Show Room Entire 4th Floor

Booklet containing fuller particulars sent on request



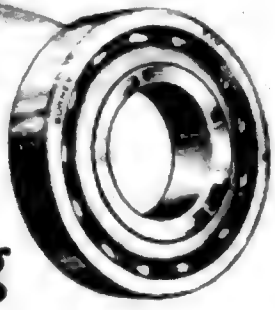
Reliable agents wanted in unoccupied territory. Drop us a postal for particulars.

CAPACITY
GURNEY
ENDURANCE



No ball bearing on
the market today has
the capacity and endurance of the

Gurney Ball Bearing



THIS advertisement is the first of a series, the object of which is to familiarize the automobile industry with the fact that no other bearing ever dreamed of even approaches the Gurney Ball Bearing in efficiency. Getting down more closely to details we say here, with the hope that you will insist upon our proving the assertion, that no other ball bearing in the world possesses these four essentials—(without any one of which no bearing can compare, even, with the Gurney Ball Bearing)—

Full complement of balls;
Solid one-piece separator;
Uninterrupted raceways;
Full depth of raceways to resist thrust.

The reason for the superiority of Gurney Ball Bearings lies in the fact that they are the only bearings which possess uniform raceways of the right contour. It is an acknowledged fact that no ball bearing is better than its raceway.

Gurney raceways are formed by a highly specialized method that produces a degree of accuracy in size, concentricity and race contour not realized by any other makers.

Other manufacturers can buy just as good steel and just as good balls but they can neither produce the perfect raceways that we produce, nor can they assemble, with as many balls, a complete bearing with a single piece separator, as we do, without slotting the raceway. Hence our position as producers of the most efficient ball bearing on the market.

It will give us the greatest pleasure to prove all these claims to your entire satisfaction. Wouldn't you like to test out these bearings yourself?

GURNEY BALL BEARING CO., Jamestown, New York

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No-Rim-Cut Tires—10% Oversize

A Story Ages Old

When one man does one thing better than anyone else, the world always finds him out.

That's all there is to the Goodyear story, now on a million tongues.

Make no mistake. One tire has not outsold all others without a reason for it.

And the hundreds of thousands who have come to this new type are not men to be deceived.

The Story Is This

Men sought a way to minimize the cost of tire upkeep.

Fourteen years ago the Goodyear people started out to find it.

The way was hard, the path unblazed, progress very slow. Five years after starting we made scarcely more than one per cent of the tires.

Three of our rivals at that time made 70 times as many.

Six years after starting our cost of replacement, under our warrant, ran 1.43 per cent. And that, in a most sensational way, broke all the records of Tiredom.

It was then—in 1906—that men began to recognize the worth of Goodyear tires.

Then Came Two Great Inventions

Then the Goodyear experts brought out a new way of building tires. It secured equal tension on every inch of the fabric. We control the patents on it.

They also brought out the No-Rim-Cut type, which is also controlled by our patents.

That ended rim-cutting, which destroys about 23 per cent of all old-type tires.

Then these tires were made 10 per cent oversize. And that, with the average car, added 25 per cent to the tire mileage.

These features together gave No-Rim-Cut tires an advantage which proved irresistible.

Flood-Like Demand

From that time on Goodyear sales doubled every year.

Then they more than doubled. Last year's increase was 125 per cent, though orders for 400,000 tires had to go unfilled.

Long ago these tires outsold every other tire in existence. Now this year's output, in all probability, will exceed two million tires.

Nearly half of all the new cars this year will go to their buyers with Goodyear equipment.

Odometers Did It

The greatest jump in Goodyear sales came with the vogue of odometers.

Men used to buy tires by guesswork—by old-time reputation. They rarely made actual comparisons.

But most cars now have mileage recorders. Men buy their tires by records.

As a result, our output today is seven times larger than two years ago.

Heed What Users Say

Some hundreds of thousands of motor cars now are running on Goodyear tires.

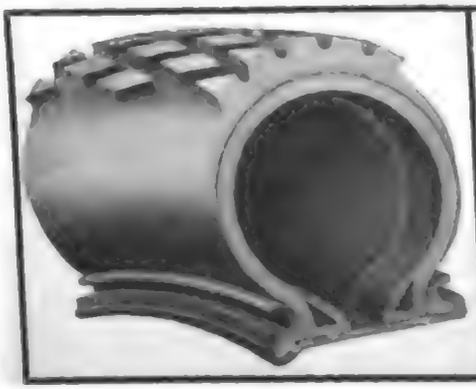
Wherever you look you will find men who know them—men who know their records. Ask some of those men to reveal their comparisons.

Common sense tells you that tires which can't rim-cut—oversize tires—must be better than others.

Common sense says that tires which **outsell** must **excel** in some ways.

Ask users if they do that. Then judge for yourself if it pays these people to insist on No-Rim-Cut tires.

Ask us for the Goodyear Tire Book—14th-year edition. It tells all known ways to economize on tires.



GOODYEAR

AKRON, OHIO

No-Rim-Cut Tires

With or Without Non-Skid Treads

Here's a Winter Tread which experts consider the very last word in non-skids.

A double-thick tread, made of very tough rubber, immensely enduring.

Deep-cut, sharp-cut blocks—countless edges and angles—insuring a bulldog grip.

Blocks which meet at the base, so the strains are distributed just as with smooth-tread tires.

Have you ever seen another non-skid which meets these essentials?

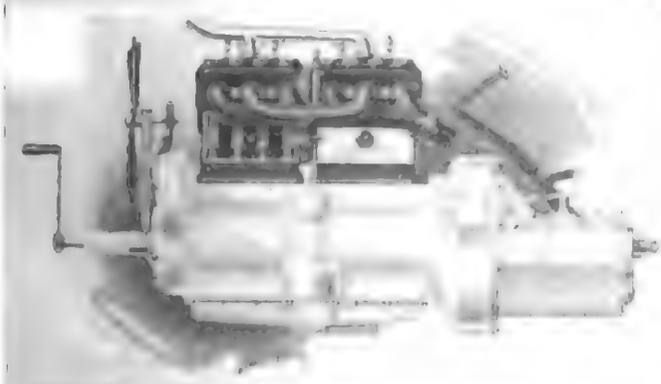
THE GOODYEAR TIRE & RUBBER COMPANY, AKRON, OHIO

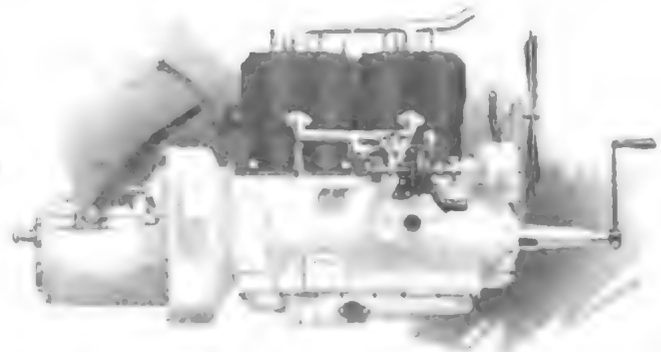
Branches and Agencies in 103 Principal Cities
More Service Stations Than Any Other Tire

We Make All Kinds of Rubber Tires, Tire Accessories and Repair Outfits
Main Canadian Office: Toronto, Ont. Canadian Factory: Bowmanville, Ont.

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ERGON MOTORS





Power—Durability—Simplicity—Accessibility

While Ergon motors are adaptable either to commercial or pleasure vehicle usage, especial attention has been paid, in their design, to the commercial end of the industry. In this branch of the automobile industry it is absolutely essential that a motor must be remarkably simple and accessible as well as powerful. For this reason Ergon motors have been designed not only for power and durability but for simplicity and accessibility as well.

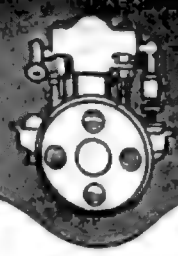
Ergon motors are four cylinder, four cycle, long stroke, 4⅜ x 6 inches, water cooled, L-head, with cylinders cast in pairs. They are of the unit power plant type, with Brown-Lipe dry plate clutch, and three speed selective transmission. Renold silent chain drive replaces timing gears and provision has been made for any one of several electric and pneumatic starters. Timken bearings are used in the transmission and the clutch is supported on F. & S. bearings.

Won't you give us the opportunity of proving out this motor to your personal satisfaction?

HAZARD MOTOR MANUFACTURING COMPANY

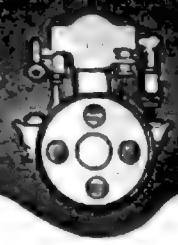
ROCHESTER, NEW YORK

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JENCICK

QUALITY MOTORS FOR HIGH GRADE TRUCKS



Learn why Jencick standards of design and construction must produce engines that are working as usual years after cheaper motors are relegated to the scrap pile.

We have information of importance for every truck designer, covering in detail points of Jencick engine superiority, and the story we have to tell giving reasons for higher cost of production, will throw a new light on what an engine ought to be and what it frequently is not.

Design is important and this feature alone marks our product the last word in modern engine construction.

Jencick Motors are designed by Stephen Jencick, whose European education with DeDion and Daimler covers a long period of years. It is this experience, coupled with American training, that has made him a master of design.

But furthermore you ought to know the reasons why Jencick Motors have manganese bronze bases instead of cast iron or aluminum—Krupp chrome nickel steel crank shafts instead of ordinary carbon or nickel steel—close grained semi-steel cylinders and pistons instead of the prevailing cast iron construction.

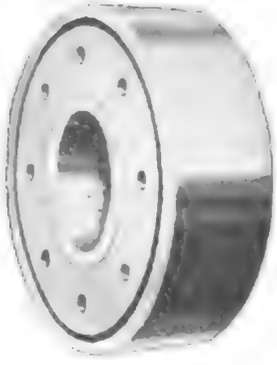
Get the comparative details showing Jencick superiority in the comparisons of elastic limit, tensile strength, elongation and reduction.

These and many other points of technical information will prove to you, Mr. Truck Engineer, just why Jencick engines are built on an efficiency and service basis not possible with makers who work on the keep down cost of production plan.

JENCICK MOTOR CORPORATION, PORTCHESTER, N. Y.



Hyatt Quiet Bearings



Hyatt Flexible Rollers will not crush under load because of their being hollow. The strength of these rollers is dependent upon the section of the steel out of which it is formed as well as the elastic limit of that material

Every size bearing is capable of carrying a certain load at a certain speed. If the carrying capacity is greatly overreached, the bearing cannot be depended upon to give permanent satisfaction. Any other automobile member subjected to excessive stress will fail under similar conditions. It is simply a matter of proper engineering.

When reasonably well mounted and operated under its proper duty, the Hyatt Roller Bearing lends itself to practical conditions as no other can. When subjected to faulty mounting—imperfect alignment—unreasonable abuse—and over-loading, no other bearing is even comparable.

HYATT ROLLER BEARING CO.
DETROIT, MICHIGAN

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Comparison proves the dominating quality of the KisselKar

COMPARE the KisselKar with cars of highest price and best reputation, and let your comparisons be on **quality,** not on price.

Such comparison is advantageous to the KisselKar because the KisselKar, beyond doubt, embraces all the quality that modern engineering, modern factory facilities and high standards **can** put into a car.

It is the maximum product of modern motor car construction, produced by a skilled organization with every facility for economy production, and with no dead weight costs to go into the prices.

Every dollar of KisselKar price represents quality in the car—and no car is better constructed, and few so liberally designed as the KisselKar.

In appearance the KisselKar is the car of superb distinction.

It offers the widest possible range of throttle control.

It will drive on high (fourth geared-up-speed) as fast or slow as you need going in all ordinary driving.

The tonneaus are roomier, the seats deeper than in any other car.

In every refinement of appointment and finish, the KisselKar meets the highest standard.

1500 lb., 1, 1¼, 2, 3, 4, 5-ton Trucks, Delivery Cars, Fire Department Apparatus, etc Write for big illustrated truck catalog.

Kissel Motor Car Co., 159 Kissel Ave., Hartford, Wis.

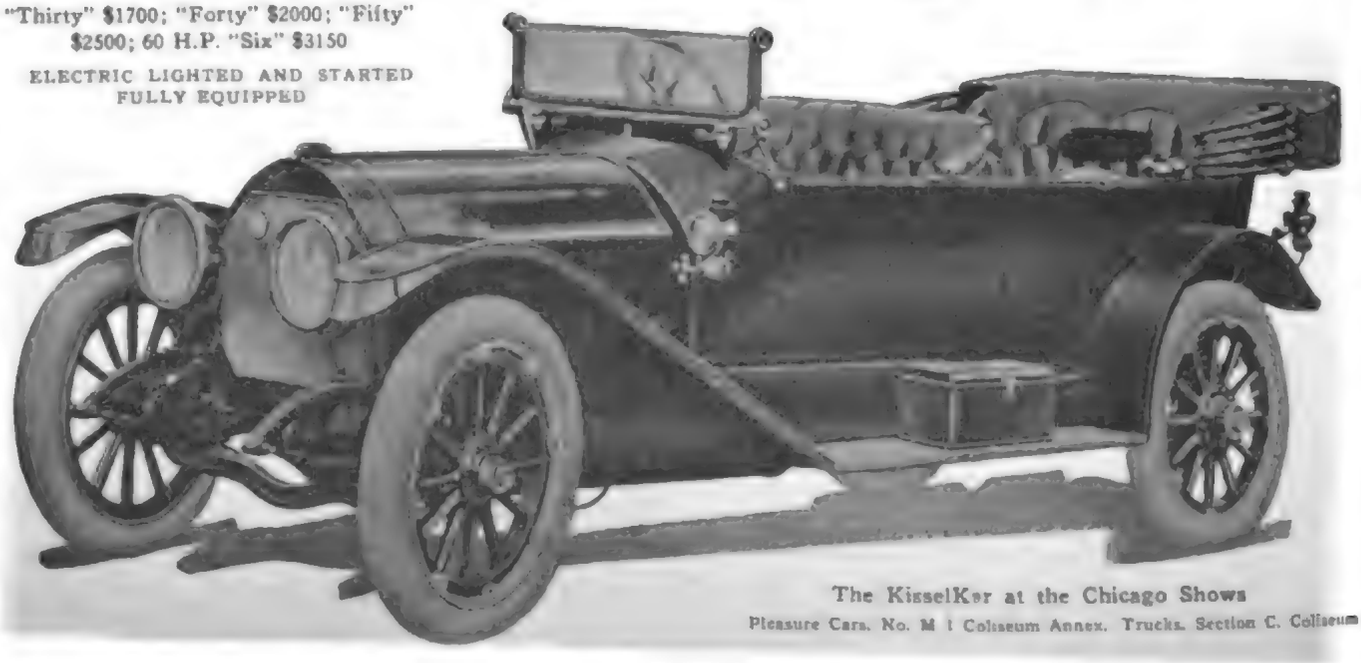
BOSTON NEW YORK CHICAGO MILWAUKEE DALLAS KANSAS CITY LOS ANGELES MINNEAPOLIS ST. PAUL

Philadelphia, Cleveland, Detroit, El Paso, San Antonio, New Orleans, Baltimore, Omaha, Butte, Denver, San Francisco, Seattle, Portland, Duluth, Buffalo, Pittsburgh, Hartford, Conn., New Haven, Albany, Troy, Montreal, Quebec, Toronto, Winnipeg, and two hundred other principal points throughout America.

KISSELKAR

"Thirty" $1700; "Forty" $2000; "Fifty" $2500; 60 H.P. "Six" $3150

ELECTRIC LIGHTED AND STARTED FULLY EQUIPPED



The KisselKar at the Chicago Shows

Pleasure Cars, No. M 1 Coliseum Annex. Trucks, Section C, Coliseum

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"Little Knox Six"

Commands Attention

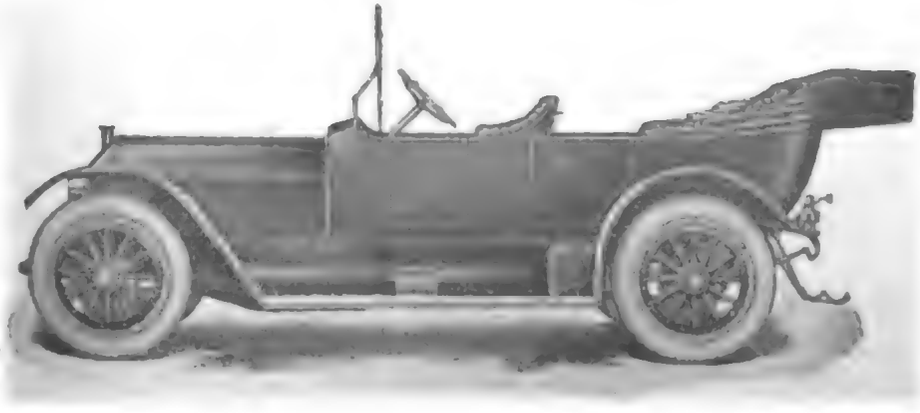
Arouses Enthusiasm

Silences Competition

Passes them all.

Made in New England

at Springfield, Massachusetts



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1913's TRADE SENSATION!!!

BOYCE MOTOMETER

PAT'S PEND'G

"MORE NECESSARY THAN A SPEED INDICATOR"

Know the Exact Heat of Your Motor While Driving!

The MOTOMETER is a watch-like instrument fitted to any radiator cap and protects the motor from damage caused by improper lubrication, overheating, defective cooling, etc. By means of a red fluid indicator, **visible from the seat** day or night, it warns

WHEN THE RADIATOR NEEDS WATER.

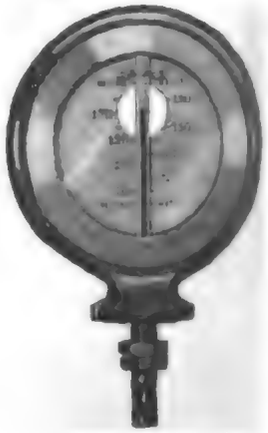
WHEN THE OIL SUPPLY IS INSUFFICIENT.

It tells whatever excessive heat tells—a broken water pump, a clogged oil pipe, a broken fan belt, etc., also when the motor and water jackets are in danger of freezing—and warns before the damage is done!

Attached as an ornament the MOTOMETER registers the inside temperature of the radiator. It gives a feeling of security to know when the car is operating correctly. The constant rise and fall of the indicating fluid, under varying road conditions, is more interesting and instructive to watch than a speed indicator.

Finished in black enamel with gold plated or nickel rims. If your dealer cannot supply you, send check or money order and we will express an instrument prepaid. Sooner or later you will drive a MOTOMETER equipped car. Enjoy it now.

DEALERS—The MOTOMETER sells at a price that means no dead stock. Act at once!



View from Seat
(Half actual size)

THE MOTOMETER COMPANY, Inc.

904 U. S. Rubber Building, 58th St. and Broadway, NEW YORK CITY
1322 Michigan Ave., Chicago, Ill.

Exhibiting at Chicago Automobile Show—Space 18A Coliseum Basement

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Prest-O-Starter

Starts your engine (old or new) quickly and easily in coldest weather

For Four Cylinders $20

For Six Cylinders $25

$1.50 extra for two-way valve necessary when the same tank is used for both starting and lighting.

Here's a starter that adds practically no weight to your car, is perfectly simple and is as durable as the engine itself. Easily applied to any engine, old or new, very economical in the use of gas, and requires no expert repairing.

How Prest-O-Starter Works

The principle of starting a motor with Prest-O-Starter is the same as "starting on compression." A measure of acetylene, at low pressure, is pumped from your Prest-O-Lite into the cylinders.

Touch your spark—your engine starts

Unlike "gasoline priming," it is not affected by heat or cold. It is certain.

In cool weather, by opening a valve on the dash, you can feed gas at low pressure into the intake manifold. This allows your engine to run on acetylene until it is warm enough to run on gasoline.

If the Prest-O-Starter did no more than prime your engine in this way during cold weather, this convenience would be well worth the price.

But Prest-O-Starter is more than a primer. When installed properly, it will start your engine, summer or winter, almost invariably without recourse to the crank.

Make Sure Your Starter Is Installed CORRECTLY—Look It Over

The Prest-O-Starter is easy to install correctly. In fact, it's so very easy to install that some good factories and garages install it with utter carelessness, overlooking the one or two simple features vital to success in operation. Fortunately this is an easy matter for the car owner to correct, even if he isn't a mechanic.

Our literature tells you exactly how the Prest-O-Starter is installed, and how to adjust it. Anyone can give it the slight attention it may need or quickly tell a dealer where the trouble lies.

Every Prest-O-Starter is sold with the assurance of satisfactory service. The entire Prest-O-Lite Organization is back of every one. If you have any trouble, report it to us or to our nearest branch. We'll wipe it out quickly.

Insist Upon GETTING the Outfit COMPLETE

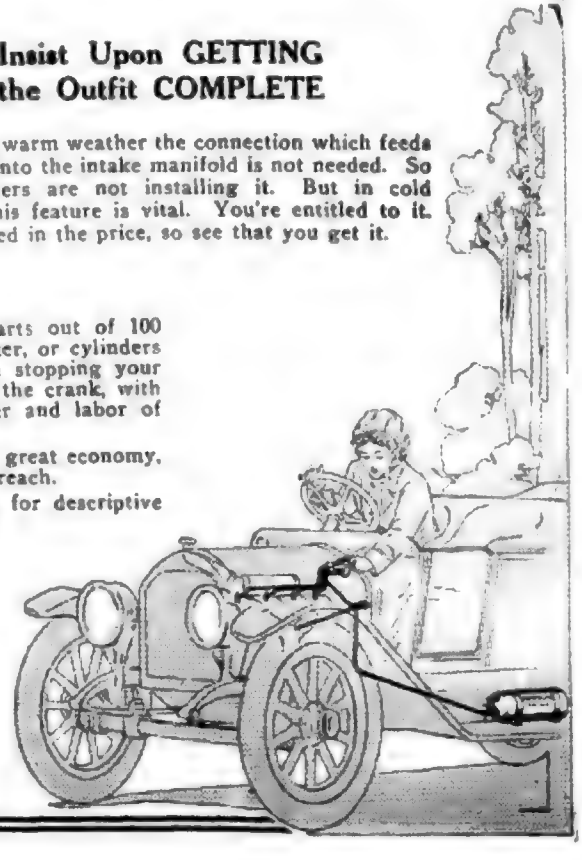
During warm weather the connection which feeds acetylene into the intake manifold is not needed. So some dealers are not installing it. But in cold weather this feature is vital. You're entitled to it. It's included in the price, so see that you get it.

Now—More Than Ever—You Need One

Your Prest-O-Starter, properly installed will average better than 95 starts out of 100 attempts. The few failures are caused by your motor stopping on dead center, or cylinders filled with burnt gas. Both of these conditions can be easily avoided when stopping your motor. But should either or both happen, an eighth or a quarter turn of the crank, with the switch at neutral, will remedy the trouble at once, with all the danger and labor of cranking eliminated.

Rest assured that no other starter can give you as high efficiency with as great economy, durability and freedom from mechanical trouble. The price is within easy reach.

Get in touch with any of our branches—or your dealer—or write us for descriptive literature



The Prest-O-Lite Co., 287 E. South St. Indianapolis, Ind.

Canadian General Offices and Factory, Merritton, Ont.

BRANCHES: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Memphis, Minneapolis, New Orleans, New York, Omaha, Philadelphia, Pittsburgh, Portland, Ore.; Providence, St. Louis, St. Paul, Minn.; San Antonio, San Francisco, Seattle, Syracuse, Merritton, Ont.; Toronto, Ont.; Winnipeg, Manitoba.

Exchange Agencies Everywhere

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Remy Magnetos

We Equip 400 Motor Cars Daily

THIS is not the record of a single day. This is a *daily average*—for four months ending with January—of cars newly equipped with Remy Magnetos. These figures have never been approached by any other manufacturer.

It is convincing, statistical evidence that the Remy Electric Company is the world's greatest manufacturer of magnetos; that Remy magnetos are greatest in demand by manufacturers, dealers and owners; that good magnetos combined with our "Ignition Service For Owners" make Remys absolutely essential to motoring satisfaction.

Do not worry along with an unsatisfactory, troublesome magneto. Buy a Remy; it will rejuvenate your car.

Remember that the Remy Electric Company is the pioneer manufacturer of magnetos in this country—one of the first in the world; *that more Remys are being used on 1913 cars than all other makes combined.*

We originated "Ignition service." We have more than 50 branches and service stations, stretching from Montreal to Los Angeles; from Vancouver to Jacksonville; and from far off Calgary to El Paso, Texas. In these stations our factory trained experts and exclusive Remy testing apparatus are at your service.

For a postal we will send you a book filled with interesting magneto information—told in a manner the layman will understand and enjoy,

Exchange your old magneto, any make, for a new 1913 Remy; it will cost you practically no more than repairs on your present ignition system.

Remy Electric Company

Anderson, Indiana

Service Stations

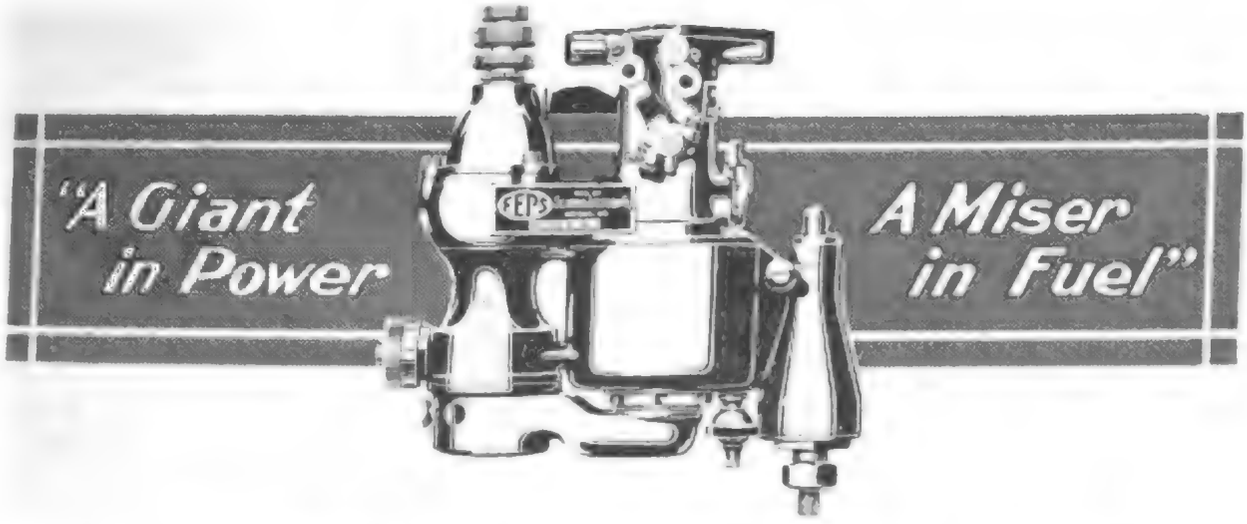
Albuquerque, N. M.
Atlanta, Ga.
Baltimore, Md.
Boston, Mass.
Buffalo, N. Y.
Charlotte, N. C.
Cincinnati, Ohio
Cleveland, Ohio
Chicago, Ill.
Columbus, Ohio
Detroit, Mich.
Indianapolis, Ind.
New York City, N. Y.
Kansas City, Mo.
San Francisco, Cal.
Dallas, Texas
Denver, Colo.
El Paso, Texas
Grand Rapids, Mich.
Houston, Texas
Jacksonville, Fla.
Los Angeles, Calif.
Louisville, Ky.
Memphis, Tenn.
Milwaukee, Wis.
Minneapolis, Minn.
Nashville, Tenn.
New Orleans, La.
Norfolk, Va.
Omaha, Neb.
Philadelphia, Pa.
Pittsburgh, Pa.
Portland, Me.
Portland, Ore.
Providence, R. I.
Rochester, N. Y.
San Antonio, Texas
Savannah, Ga.
Seattle, Wash.
Spokane, Wash.
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Every Reliable Accessory Dealer

should have our attractive proposition on



The FEPS CARBURETOR

You've heard so much about wonderful carburetors that you're probably case-hardened in skepticism. We submit, however, these two series of facts for your consideration.

FIRST. The Carburetor is today the most imperfect part of the automobile, and far behind, in efficiency, every other accessory. There's real need of a real carburetor.

SECOND. The Feps Carburetor splendidly meets that need. It involves an entirely new principle of auxiliary air supply, producing a marvelous increase in flexibility; an absolutely perfect mixture at all speeds, with an increase of 25% to 50% in miles per gallon of fuel on any car. It contains no springs, no balls, no cams, no reeds, and all adjustments once made are permanent. It gives a perfect mixture with any grade of gasoline and is unaffected by altitude, weather conditions or change of temperature. It also embodies a never-failing quick-starting device.

The first fact you cannot dispute, the second you probably will, until you test out the Feps at our risk. Get in line with the Feps now for increased business and profit.

FEPS CARBURETOR

Write at once for
Descriptive Illustrated Booklet

Schoen-Jackson Company
Department "F"
Media, Pa.

FEPS CARBURETOR

Prevention of Industrial Accidents

Is one of the most serious problems confronting Employers of Labor to-day

Employers are eager to adopt all possible means for the *Prevention of Industrial Accidents*, but the magnitude of present day enterprises deprive the executive heads of the intimate knowledge of conditions necessary to effective improvement.



THE most effective service for the prevention of accidents, the result of twenty years practical experience, is offered its policy holders without charge by

The Travelers Insurance Company

Hartford, Conn.

TRAVELERS service provides systematic and minute investigation of plants and equipment; advice as to the elimination of danger points, installation of efficient and economic safety devices, handling and storage of material, factory methods and supervision.

Inspections are made by specialists where needed and by general inspectors acquainted with the work of all departments of a plant and of general constructive methods. During 1912, The Travelers made 142,000 inspections involving 850,000 recommendations for improvement of working conditions.

The Pennsylvania Railroad after largely reducing the number of serious accidents to their shop employees stated "We should fail in our duty if we did not give The Travelers Insurance Company credit for the systematic methods now in use over the Pennsylvania lines."

A years subscription to the ***Travelers Standard*** a monthly devoted to Safety Engineering and the Prevention of Accidents, will be sent on request by filling in the coupon below.

The TRAVELERS INSURANCE COMPANY, Hartford, Conn. *(Motor World 1.)* TEAR OFF

Send me TRAVELERS Standard for one year without charge.

Name..... **Address**.....

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Sanford

MODEL "K" TRUCK

Capacity One Ton

A happy medium between the heavy expensive truck and the light delivery car

The motor is four cylinder, 30 H. P., water cooled, built as a unit, with selective three speed transmission, multiple disc clutch and fly wheel, all enclosed in an oil tight aluminum housing and hung with three point suspension. The axles are Vanadium Steel fitted with large roller bearings, sprockets are heavy and fitted with 1¼ inch roller chains—wheels are 36 x 3½ front and rear.

Our new factory will greatly increase our output for 1913, and we are offering an exceptional opportunity to live dealers

PRICE, AS SHOWN, $1,750

WRITE OR WIRE US

Sanford Motor Truck Company

No. 2-18 St. Mark's Place
Syracuse, New York

SEE OUR EXHIBIT
CHICAGO SHOW
First Regiment Armory, Main Floor, Space E-3



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Eleven World's Records Beaten on Rudge-Whitworth Detachable Wire Wheels



This wheel is shown after two terrific speed contests. Note the condition of the tire.

Every Rudge-Whitworth Wire Wheel is equipped with the Houk Quick Detachable Rim

Considering the fact that more than 20 makes of cars were exhibited at the New York and Chicago Shows, this year, carrying wire wheels as regular equipment—considering the further fact that more than 30 of the leading manufacturers of the country will use wire wheels on their product this year—(and probably double that number in 1914)—the wonderful showing of Hemery in acquiring 11 new world's speed records on Rudge-Whitworth wire wheels becomes of secondary importance to American manufacturers and dealers.

And, still, an analysis of the table of records on the opposite page is extremely interesting in showing, practically, the correctness of the theory of the wire wheel invasion. If Rudge-Whitworth wire wheels can add life to racing tires and speed to speed creations where driving and abuse are at the maximum extreme always, then surely Rudge-Whitworth wire wheel efficiency for general pleasure car work cannot be denied.

This recent series of Rudge-Whitworth wire wheel victories is but the climax of a truly remarkable year in Wire Wheel history. All the big races abroad have been nearly clean sweeps for Rudge-Whitworth, with all the winning cars so equipped. In this country wire wheels have made a wonderful showing in the big American races—so much so that nearly all the noted drivers are planning to use wire wheels next year. Abroad, of course, about 85 per cent. of the medium and best grade cars are wire wheel equipped, and wooden wheels have practically disappeared. At the foreign shows wooden wheels were so scarce as to be almost a curiosity.

And the only reason that many more manufacturers did not show Rudge-Whitworth wire wheels at New York and Chicago was the fact that they could not get them in time.

Which brings us to the real important point affecting you manufacturers and dealers.

If you will co-operate with us to the extent of placing contracts and delivery dates immediately, we can take care of your demands.

Why Leading Manufacturers Abroad Use Rudge-Whitworth Detachable Wire Wheels

DISTANCE RECORDS

100 Miles 1 hr. 1 min. 27.09 secs. = 97.02 m.p.h.
150 Miles 1 hr. 31 mins. 52.06 secs. = 97.97 m.p.h.
200 Miles 2 hrs. 5 mins. 56.73 secs. = 95.51 m.p.h.
400 Miles 4 hrs. 34 mins. 23.87 secs. = 87.46 m.p.h.
500 Miles 5 hrs. 48 mins. 38.87 secs. = 86.05 m.p.h.

TIME RECORDS

1 Hour 97 miles 1,037 yards = 97.59 m.p.h.
2 Hours 189 miles 1,747 yards = 94.99 m.p.h.
3 Hours 284 miles 817 yards = 94.82 m.p.h.
4 Hours 344 miles 1,344 yards = 86.19 m.p.h.
5 Hours 422 miles 1,574 yards = 84.59 m.p.h.
6 Hours 518 miles 312 yards = 86.36 m.p.h.

Table of World's Records Established by Hemery Driving a Lorraine Dietrich

CAR AND DRIVER SHOWN BELOW

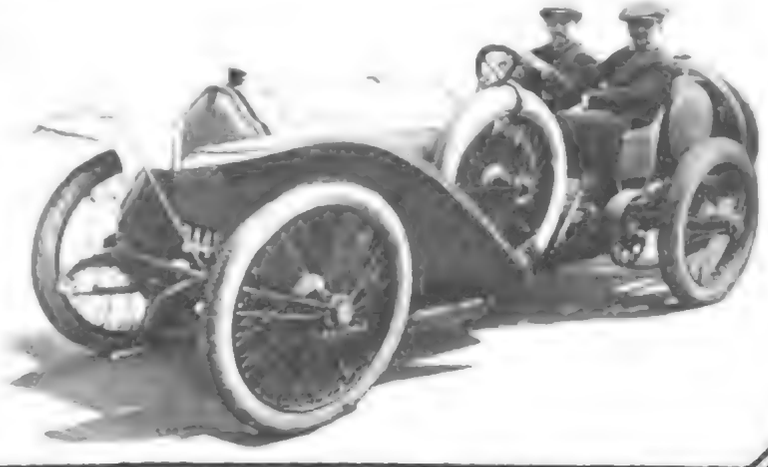
Hemery started out for the six hours race world's record with the idea of smashing as many intermediate records as possible.

The table shows his success.

That Rudge-Whitworth wire wheels played an important part in the establishing of these records is more clearly shown when it is considered that the previous records were held by a car not mounted on wire wheels. In the six hours, Hemery was able to increase the record from 451 to 518 miles and he was able to reduce the time for the first 500 miles from 6 hours 40 minutes to 5 hours 48 minutes, almost an hour faster than the previous record. The average speed for the 500 miles was 86 miles per hour as against 74 with the car not equipped with wire wheels.

The average speed for the six hours was 86 miles an hour as against 75 for the car not equipped with wire wheels. It is also interesting to note that in the first 50 miles of the last hour, Hemery maintained a speed of 101.61 miles per hour. Still more remarkable is Hemery's record when it is considered that during the third hour he was forced to stop 23½ minutes to replace a couple of cracked shackle bolts.

Our handsome book on wire wheels mailed upon application.



George W. Houk Co.
804 Penn Square Bldg., Philadelphia, Pa.

NEW DEPARTURE

The Quality Bear

Chicago Automobile Show, Both Weeks,

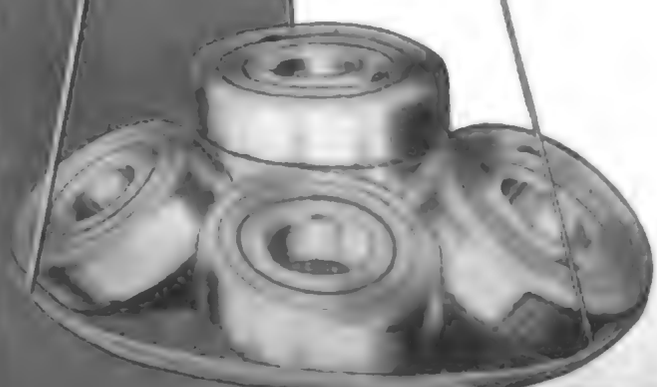
Among the most conspicuous developments in the perfecting of the automobile is the increasing use of ball bearings in preference to those of other types.

A leading publication in the trade has carefully summarized the details of 1913 models and shows that ball bearings are used in the differential of 53 per cent. of the pleasure cars for 1913, as against 37½ per cent of the 1912 cars; in the transmission of 75 per cent. of the 1913 models, as against 64 per cent. of the 1912 cars, and in the rear wheels of 52 per cent. of the 1913 models, as against 42 per cent. of the 1912 cars.

American Made for

A further important fact is that the 1913 European cars are universally equipped with ball bearings.

The American Made New Departure ball bearing is in more than 80% of the American pleasure cars made for 1913 selling. This bearing is guaranteed for strength of material, uniformity of dimension, accuracy of manufacture and fineness of finish.



THE NEW DEPARTURE MANUFAC

Western Branch: 1016-17

BALL BEARINGS

ing of the World

Congress Hotel, Suite 1-7, Floor "J"

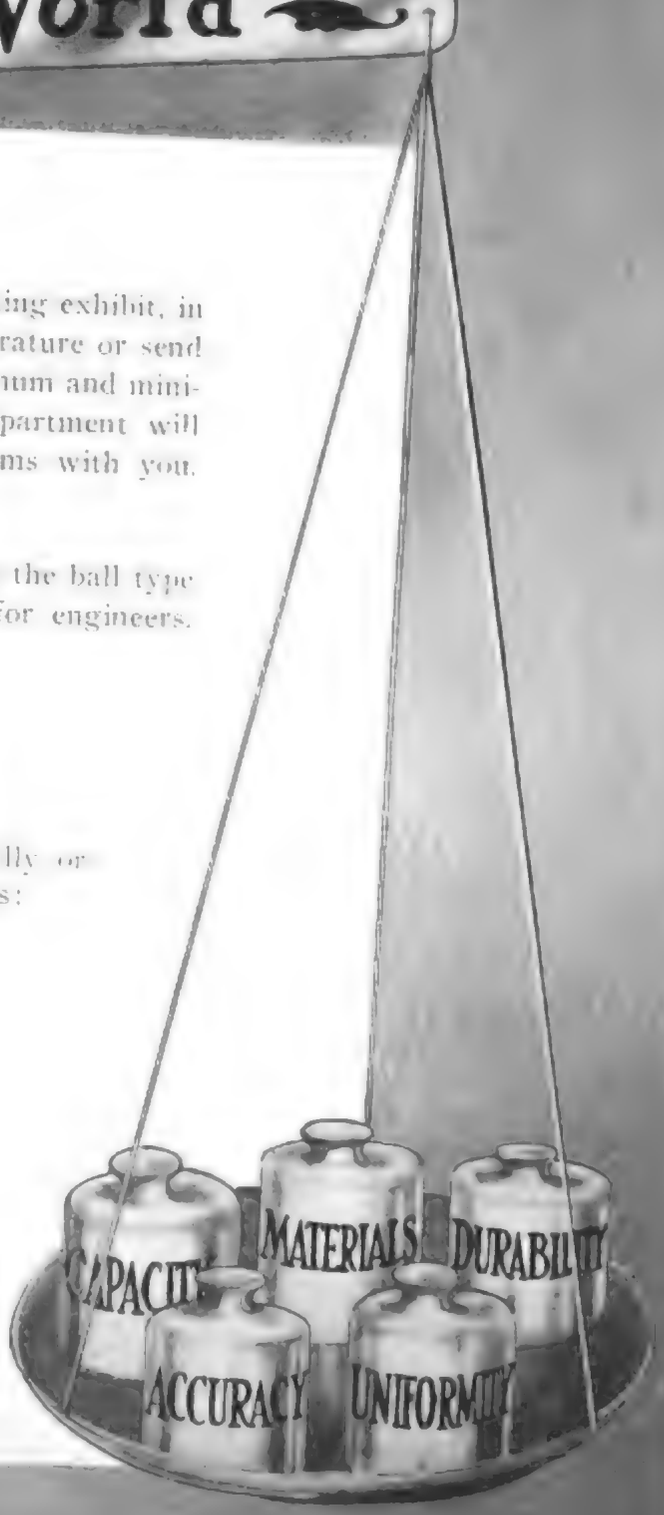
If you cannot get to Chicago to see our interesting exhibit, in Suite 1-7, Floor "J," Congress Hotel, write for literature or send us your blue print with information covering maximum and minimum loads and speeds, and our Engineering Department will frankly and honestly discuss your bearing problems with you. There is no charge for this service.

A special booklet is now on the press discussing the ball type of bearing and its advantages, written specially for engineers. Send us your name for a copy.

American Trade

Here is a list of over fifty pleasure cars, partially or wholly equipped with New Departure Ball Bearings:

Amer
Ampiex
Apperson
Auburn
Austin
Babcock (Electric)
Borland (Electric)
Bergdoll
Brox (Electric)
Buick
Carnercar
Case
Chalmers
Chevrolet
Cutting
Detroiter
Dominion
Empire
Enger
Firestone-Columbus
Glide
Grant-Six
Great Western
Halliday
Havers
Henderson
Imperial
Jackson
King
Kline
Krit
Lenox
Lozier
Marathon
Marion
McFarlan
Michigan
Mitchell
Nyberg
Oakland
Oldsmobile
Overland
Paige-Detroit
Pathfinder
Patterson
Pilot
Schacht
Selden
Standard (Electric)
Staver
Stutz
Warren
Wayne



TURING COMPANY, Bristol, Conn.

Ford Building, Detroit

Overland

OVER fifteen thousand Overlands have been delivered during the last five months. This is an increase of 300 per cent. over the same period last year. And last year we led every thousand dollar automobile producer in America.

This is more cars than all the automobile factories in Germany turn out in a whole year. Our 1913 sales are more than *double* those of any other manufacturer producing a similar car.

Our 1913 literature describes, explains and illustrates what we are—what we have and what we can do. It's all free. Please write the factory.

Address Department 50

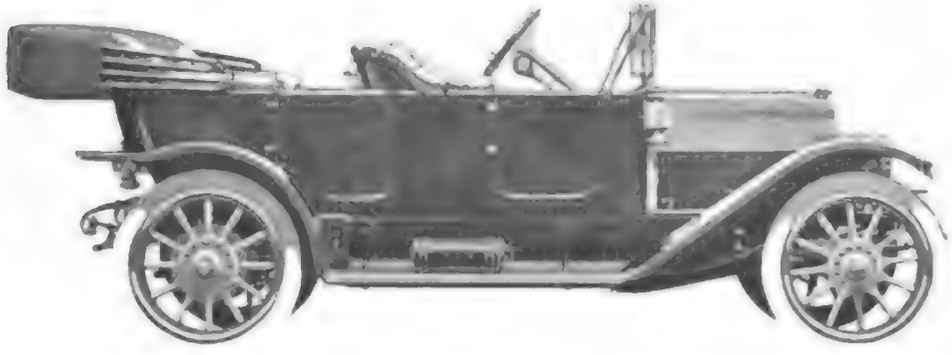
The Willys-Overland Company
Toledo, Ohio

Overland

$985 — Completely Equipped

Model 69-T

Self-starter
30 Horsepower
5-Passenger Touring Car
110-inch Wheel Base
Timken Bearings
Center Control
Remy Magneto
Warner Speedometer
Mohair Top and Boot
Clear Vision, Rain Vision Wind Shield
Prest-O-Lite Tank



$1475 — Completely Equipped

Model 71-T

Complete Electric Lighting Outfit, Generator and Storage Battery
Self Starter
45 Horsepower
Q. D. Demountable Rims
Timken Bearings
Center Control
Wheel Base 114 inches
Brewster Green Body, ivory striped, nickel plated and dead black trimming
Warner Speedometer
Mohair Top and Boot
Clear Vision, Rain Vision Wind Shield
Prest-O-Lite Tank
Extra Rim



Touring Cars, Roadsters, Coupes and Torpedo Bodies



OBSERVE carefully, at the Chicago show, the preponderance of Eisemann magnetos with ***Automatic Spark Control*** on the trucks of class and size. The more severe the demands upon the truck the more likely that it is equipped with Eisemann magneto with ***Automatic Spark Control.***

The fact that Eisemann systems are found on so large a percentage of commercial vehicles speaks volumes for the efficiency and reliability of these products. In this field real merit counts most, for the success of the truck depends upon its economical operation and up-keep and in these essentials proper ignition plays a most important part.

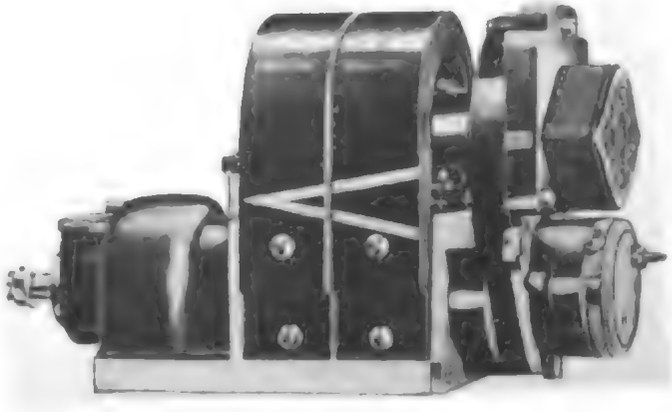
The remarkable gain in volume of business and in number of concerns using Eisemann equipment recorded in the last year or so is another evidence of the growing realization

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AUTOMATIC SPARK CONTROL

of the real value of Eisemann ignition devices. In this short space of time the increase has been something over two hundred per cent with no let-up in sight. In spite of this fact we have been able to live up to our promises fully as regards deliveries and shipments.

There's no reason why you can't have the most efficient ignition system on your product and have no delays in the delivery thereof. Better get in touch with us today.



The Eisemann Magneto Co.

General and Sales Office:
225-227 West 57th Street, New York

INDIANAPOLIS, IND.
514 North Capitol Ave.

DETROIT, MICH.
502 Woodward Ave.



Triplex

Finishes the Work the Carburetor Leaves Half Done

ECONOMIZES FUEL INCREASES MILEAGE PROMOTES FLEXIBILITY
PREVENTS BACK FIRING THE READIEST SELLER ON THE MARKET

A DIRTY MOTOR IS A SHORT LIVED MOTOR

Nothing tends to lower the efficiency, flexibility and sweet running qualities of a motor quicker than an improper mixture. Faulty carburetion is the prime cause of carbonization. Carbon-clogged cylinders, sooty spark plugs sap the ambition out of a motor, shorten its service.

Loss of COMPRESSION is caused from DIRT taken into cylinders through CARBURETOR. The TRIPLEX MAKES IT AN IMPOSSIBILITY for ROAD DIRT to get into the cylinders. DIRT OR DUST acts as a grinding material and causes loss of compression by grinding down PISTON, RINGS, AND PITTING OF VALVES.

THE TRIPLEX MAKES IMPERFECT CARBURETION A MECHANICAL IMPOSSIBILITY

The TRIPLEX is a device placed between the MANIFOLD AND CARBURETOR TO BREAK UP the mixture—the fuel.

The TRIPLEX will EQUALIZE the most UNEVEN mixture that leaves the carburetor—makes it uniform throughout.

Operating as it does on a tried and proven scientific principle, the TRIPLEX insures a mixture which will burn CLEAN to the last atom. It is a physical impossibility for a bit of live gas to remain unignited. BLACK SMOKE is emphatically done away with—CARBONIZATION forestalled.

A TRIPLEX WILL PAY FOR ITSELF IN TWO MONTHS. By utilizing every drop of gasoline to its full capacity, the TRIPLEX makes a saving of over 25 per cent. per gallon. It gives you 5 gallons of FUEL at a cost of FOUR. It makes high-test gasoline out of low.

Furthermore, it increases power proportionately. The full cylinder charge is ignited every time—the maximum power delivered at the point of highest efficiency. Because there is no fuel waste, there is no power waste. A TRIPLEX is a double economy—it INCREASES power at the same time it DECREASES fuel consumption.

INSURE YOURSELF AGAINST BACK-FIRING WITH A TRIPLEX. Another advantage it possesses is that it prevents FIRING a car due to the fact that any FLAME is cut off in trying to go through the TRIPLEX. The principle is the same as the non-explosive feature of a miner's gauze lamp.

Further advantages are that a TRIPLEX makes starting easier regardless of temperature or atmospheric conditions, and stops portion of live gasoline when the motor is cold.

The TRIPLEX can be readily attached by anyone in one-half hour's time.

THE TRIPLEX IS GUARANTEED. The TRIPLEX is guaranteed to do all we claim for it, or your money back. Therein lies YOUR protection. For further information write us.

1 in.	$3.50
1¼ in.	4.00
1½ in.	4.50
1¾ in.	5.00
2 in.	5.50
2½ in.	6.00

TO BE HAD AT ALL DEALERS OR DIRECT ON RECEIPT OF PRICE

DEALERS: Here is one of the fastest selling little devices on the market. Every motorist has got to have one. Big sales spell big profits. Get our sales proposition TODAY.

Write or Wire Us.



Bremer-Wilson Manufacturing Co.

1475 Michigan Blvd. CHICAGO, ILL.

AUSTERMELL & HANSON, Western Representatives, 560 Phelan Bldg., San Francisco, Cal.

The Triplex Starter

for FORD Engines



"It is out of sight," under the hood. All that shows is a small hand lever on dash. You do not have to leave your seat to start your Ford Motor when equipped with the TRIPLEX STARTER.

All that is necessary is to pull the lever. Will positively turn your motor over every time.

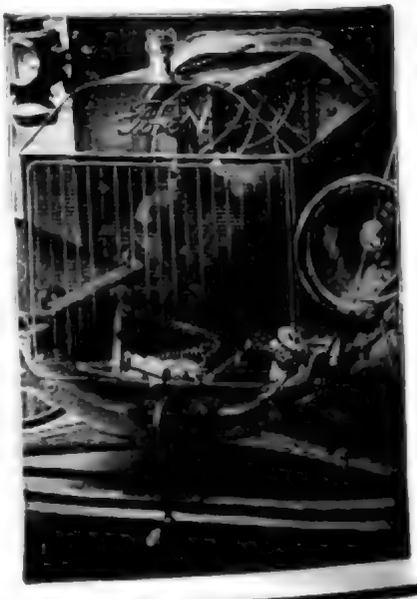
The TRIPLEX FORD ENGINE STARTER is a mechanical starter, which, of all types—compressed air, acetylene gas, electric and spring—is the only one on the market which at all times proves absolutely RELIABLE. In no respect is it a "Hit or-Miss" proposition—working one minute and short-circuiting or blowing out a cylinder head the next. It gives 100% uninterrupted service from the time it is attached. It comprises so few parts and is so simple and direct in application that it cannot get out of order, and it is as safe and durable as it is simple and effective.

With the TRIPLEX STARTER you have two starting devices. You do not remove the crank. It stays on.

"Ask the man that has one."

To be had at all dealers or direct on receipt of price.

DEALERS.—It doesn't require SALESMANSHIP to sell an ARTICLE for which every FORD OWNER is clamoring. Bring the TRIPLEX FORD ENGINE STARTER and the FORD OWNER together and a sale results. Big Sales spell Big Profits. Get our Sales Proposition today. Write or Wire. No more broken arms. Back kicks are dangerous.



PRICE $11.50

Write Department 10

BREMER-WILSON MANUFACTURING CO.

1475 MICHIGAN AVENUE, CHICAGO, ILL.

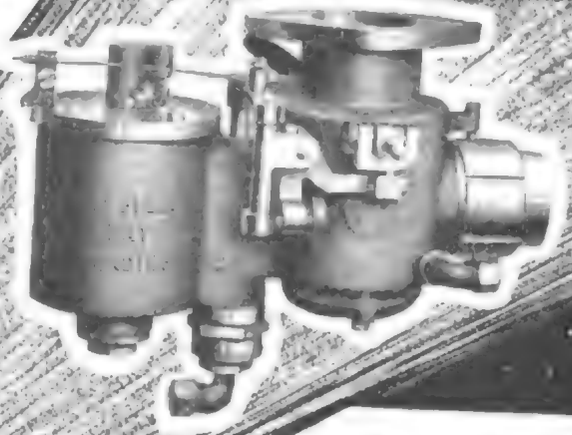
Western Representatives, AUSTERMELL & HANSON, 560 Phelan Bldg., San Francisco, Cal.

RAYFIELD CARBURETORS

The Sensation of the Year

RAYFIELD Carburetors created wonderful interest at the New York Show. Motorists from all over the world were eager to learn why the RAYFIELD had won its reputation for being

"The World's Greatest Carburetor."

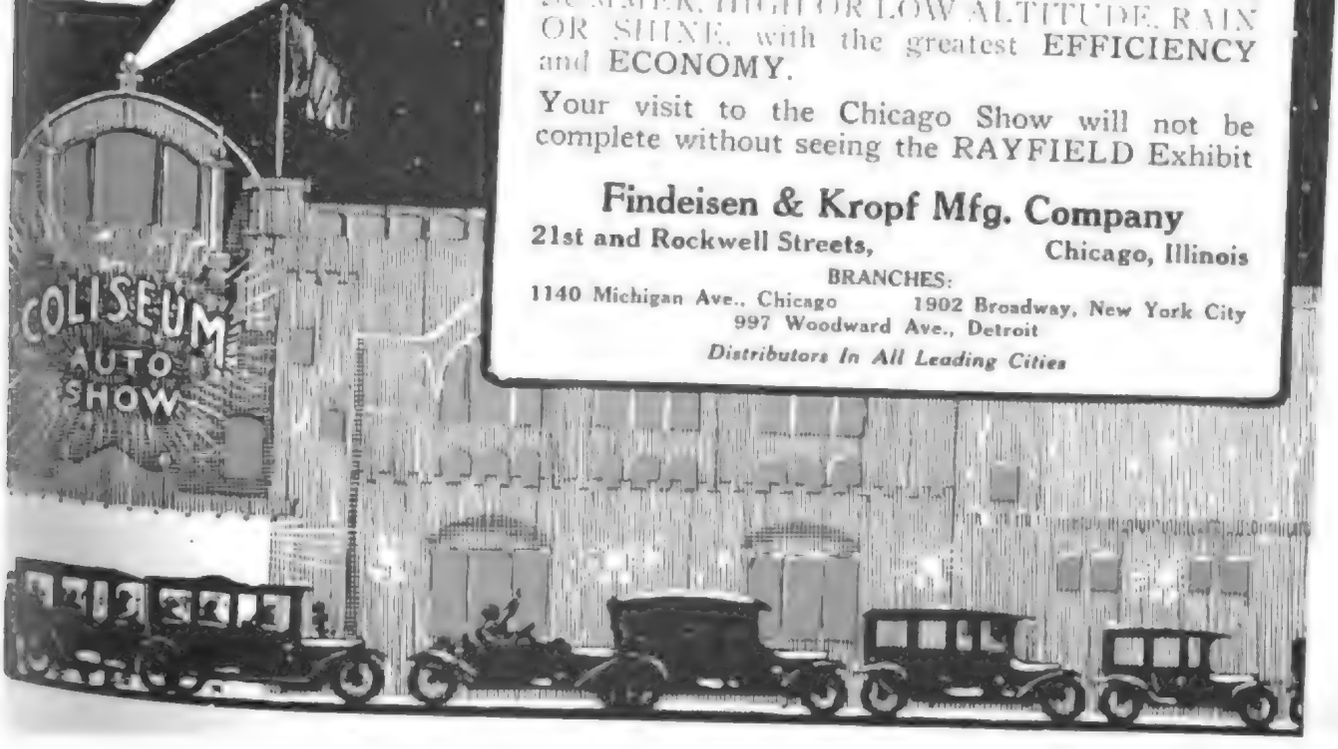


Those who have not investigated the superlative merits of this carburetor should not fail to do so—

At the Chicago Show, Coliseum Annex, Spaces 114-116

Competent men will be on hand to show you why the RAYFIELD, through its perfection in design and construction, holds more WORLD'S RECORDS in every kind of contest than all other carburetors. They will also show you why the RAYFIELD makes good in every-day service, WINTER OR SUMMER, HIGH OR LOW ALTITUDE, RAIN OR SHINE, with the greatest EFFICIENCY and ECONOMY.

Your visit to the Chicago Show will not be complete without seeing the RAYFIELD Exhibit



Findeisen & Kropf Mfg. Company

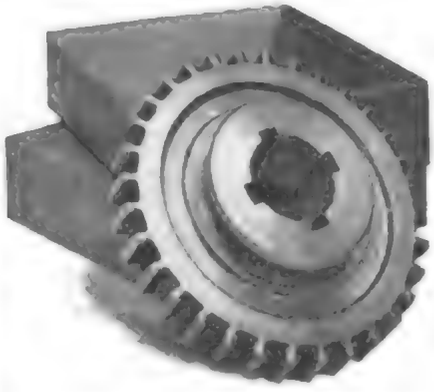
21st and Rockwell Streets, Chicago, Illinois

BRANCHES:

1140 Michigan Ave., Chicago 1902 Broadway, New York City
997 Woodward Ave., Detroit

Distributors In All Leading Cities

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Out of 30,000 Gears 29,982 Found O. K.

By Particular Manufacturer

A short time ago we completed a contract with one of the largest automobile manufacturers (name on request), whose product has a most excellent reputation for quality.

This contract consisted of 30,000 Transmission Gears, made from our special brand of 3½ per cent. Nickel Steel.

Although the inspection department of this manufacturer is the most exacting and careful of which we have knowledge, only 18 of this vast quantity of gears were not accepted.

GRANT-LEES GEARS

can be depended on for durability, accuracy in measurements and perfection in finish.

We **specialize** on automobile gears. We believe our heat-treating department the most efficient in the business. It is in charge of a man who has specialized in gears for twelve years.

Grant-Lees Gears are exceedingly hard, long-lived and durable—and wonderfully tough. They can be depended upon to stand up through every emergency.

Grant-Lees Gears have a fine, smooth finish that is the envy of our competitors. No one else takes such exacting pains in this work. To keep the finish perfect and protect our gears from any possibility of harm, each gear is packed in an individual box—as carefully as ball bearings are packed.

We Can Make You Better Gears and Save You Money

Why keep a big investment tied up in gear-making machinery, stock and labor hire, when you can contract for all the Grant-Lees Gears you want—get them just when you want them—get assured satisfaction—and get them at a lower cost than you can manufacture them in your own shops?

Let Us Get Down to Facts and Figures With You

THE GRANT-LEES MACHINE CO., 2360 Sixty-ninth St., Cleveland, Ohio



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HESS AXLES



THE prestige and reputation attained by the Hess Spring and Axle Company as manufacturers of high grade motor car axles is as unique as the motor car industry itself.

Although the first axles were produced more than four years ago, two years were devoted to testing and experimenting before the first axles were placed on the market. Since then fourteen manufacturers have exclusively adopted Hess axles.

A further gratifying fact of the success of Hess axles is the increasing demand from new manufacturers and renewals of contracts from present users.

Hess axle equipment on your cars means assurance of successful service and the elimination of axle trouble.

THE HESS SPRING AND AXLE COMPANY

CARTHAGE, OHIO, U. S. A.

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SPRINGFIELD CONVERTIBLE BODIES

With a Springfield Convertible Body, a few minutes work will turn the open touring car into a handsome luxurious closed car.

This radical departure from the unsightly, uncomfortable, ordinary top, is the final result of three years' development and it is today the *only* practical all-year-round body on the market.

When open, there are no signs calling attention to the fact that the body can be entirely enclosed in glass—just an ordinary closed top is visible as shown in this illustration.

When in position, the Springfield Convertible Body gives a beautiful glass enclosed, weather proof car with wide doors free from obstructions—in every way equal to the permanently closed car in appearance and comfort.





The transformation can be worked in remarkably short time through the simple operation of raising the top and adjusting the glass windows which are contained in a box back of the front seat when the car is open.

The Convertible Top feature is exclusive on Springfield Metal Bodies. It will not fit any other body, but we are prepared to make prompt deliveries on all designs from the little runabout to the largest limousine or landaulet.

Further information is at your command. Write for it.

Springfield Metal Body Co.

Springfield Massachusetts

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CHURCH-FIELD BROUGHAM

The only Electric Car with a two speed transmission—a high and low gear. You'll realize instantly what that means.

Church-Field Electric

combines the convenience, the simplicity of operation and the luxury of the electric with the sturdy all round efficiency of the gasoline car. The two speed transmission means an enormous saving in cost of maintenance because it minimizes wear and tear on the batteries and consumption of current. Furthermore, it places the Church-Field on the same footing as the gasoline car in hill climbing and heavy road work.

Responsible dealers are invited to write for available territory

THE CHURCH-FIELD MOTOR CO.

Detroit, Michigan

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Our Modest Output

By R. E. Olds, Designer

After 26 years, and perhaps a record success, I am building but 50 cars daily.

Men ask, Why this modest output?

Why aren't you today in the 40,000 class, with all this fame, all this experience, and with such a car as Reo the Fifth?

Not for Lack of Orders

It isn't due to any lack of demand. There were times last year when orders from users ran five times our factory output.

For months at a time we were thousands of cars behind on immediate shipments.

And the same condition will repeat itself. We know that now. In April and May there will be five buyers for every car, no doubt.

But here's the other side:

The Other Side

Our present output, with this model factory, brings the cost of production down to the minimum.

If I build two or three models the cost would increase by some 20 per cent, I figure.

A larger output would make impossible such supervision as this car gets. I can't find the men to give it.

And hurrying men, or working nights, would lead to oversights.

Here's What We Do

Each lot of steel is analyzed twice, before and after treating.

Gears are tested in a crushing machine, to prove that each tooth will stand 75,000 pounds.

We use special springs, made from the center one-third of the finest steel ingots. And those springs are tested for 100,000 vibrations.

We use a $75 magneto to stand the tests which we require of that.

Everything is discarded—materials or parts—which shows the least shortcoming.

Parts are ground over and over to get utter exactness. Tests and inspections are carried here to the very last extreme.

Each engine, for instance, is tested 48 hours—20 hours on blocks, 28 hours in the chassis. There are five long tests, covering every requirement.

Where Savings Go

We have, as I say, ideal factory efficiency. Engineers from everywhere come here to inspect it.

I have spent years and years in perfecting it, and I cannot apply it to a larger production.

We build only one model. We build all our own parts. We make no material changes, for our car is right. So our tools and machinery last year after year.

We save in these ways some $200 per car. It is that saving which pays for all this care and inspection. And it pays for things like these:

Costly Extremes

We give to each part a big margin of safety. In fact, each part is built to stand the tests for a 45 h. p. car.

We use 15 roller bearings—11 of them Timkens—where the usual ball bearings would cost one-fifth as much.

We use in each car 190 drop forgings, at twice the average cost of steel castings. We do this to make flaws impossible.

We equip the car with over-size tires—34x4. The cost is about $60 per car over tires which some call sufficient on a car of this weight. But the cost comes back to you over and over in the lower tire upkeep.

We use a centrifugal pump.

We use 14-inch brake drums.

We use 2-inch, 7-leaf springs.

Then note the costly finish. Each body gets 17 coats.

The deep upholstering is of genuine leather, filled with the best curled hair.

Every detail shows the final touch. The electric side lights are set in the dash. And even the engine is nickel-trimmed.

All for $1,095

To build a car like this, inside and outside, for $1,095, is an amazing achievement.

It would be to me an impossibility on a much larger production. And a lesser car would not be wanted when men found it out.

That's why I limit my output.

It is also the reason why men want more cars than I can build.

The $100 Control

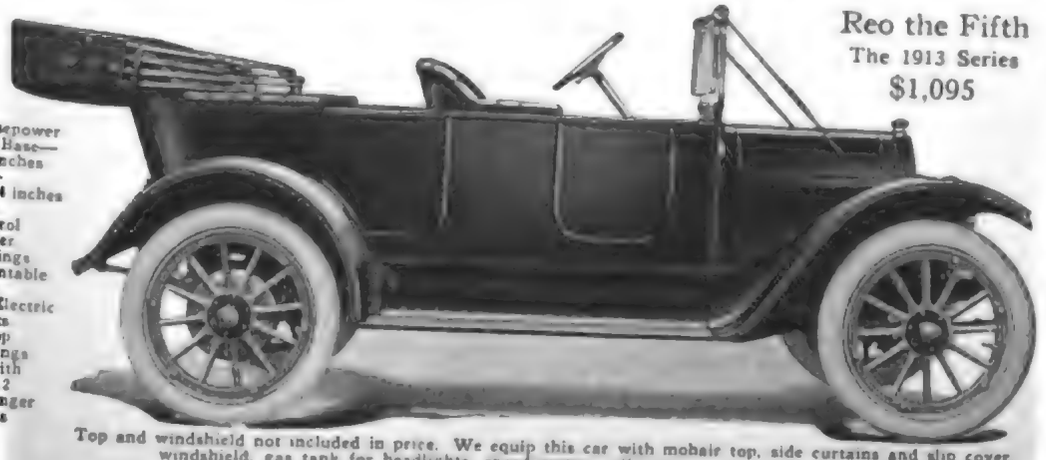
I believe men would pay $100 extra for the center control in this Reo the Fifth. Yet it adds not one cent to the cost.

All the gear shifting is done by one light handle, entirely out of the way. It is done by moving this handle only three inches in each of four directions. It is as simple as moving the spark lever.

No reaching—no levers in the way. Both brakes are operated by foot pedals. Both the front doors are clear.

This arrangement permits of right-hand control, combined with left-side drive. And that is regarded as an essential in a car that's up to date.

A thousand dealers handle Reo the Fifth. Write for our 1913 catalog, and the nearest dealer's address. Then see him, please, before the April rush.



Reo the Fifth
The 1913 Series
$1,095

30-35 Horsepower
Wheel Base—112 inches
Tires—34 x 4 inches
Center Control
15 Roller Bearings
Demountable Rims
Three Electric Lights
190 Drop Forgings
Made with 5 and 2 Passenger Bodies

Top and windshield not included in price. We equip this car with mohair top, side curtains and slip cover, windshield, gas tank for headlights, speedometer, self-starter, extra rim and brackets—all for $100 extra (list price $170).

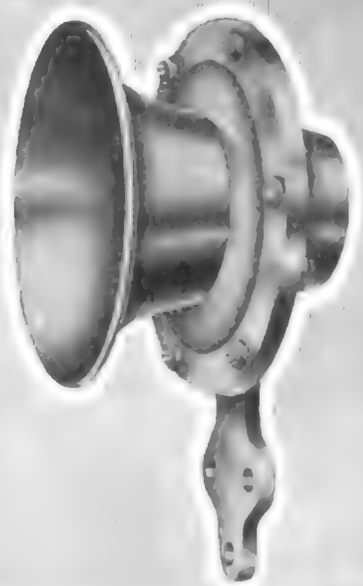
R. M. Owen & Co., General Sales Agents for **Reo Motor Car Co., Lansing, Mich.**

Canadian Factory, St. Catharines, Ont.

QUBIT

ELECTRIC HORN

THE ULTIMATE SUCCESSOR



TO THE BULB HORN

Dealers!

This out-of-ordinary electrical signal will find ready sale where ever introduced

Louder, more durable and better looking than the bulb horn.

Sells on sight. See next page

285,000 ELECTRIC GUBIT HORNS ALREADY CONTRACTED FOR



RETAIL FOR **THREE** DOLLARS

BIG DEALERS OPPORTUNITY

For dealers who have not responded to our previous advertising

Here is a real signal at a low price.

Has a high-toned musical blast---uses but little current---has no **vibrator** (the diaphragm is the armature)---cannot wear out, but gets better with age---needs no oil---runs on **six volts**---cannot get out of order.

Black enamel with very high gloss.

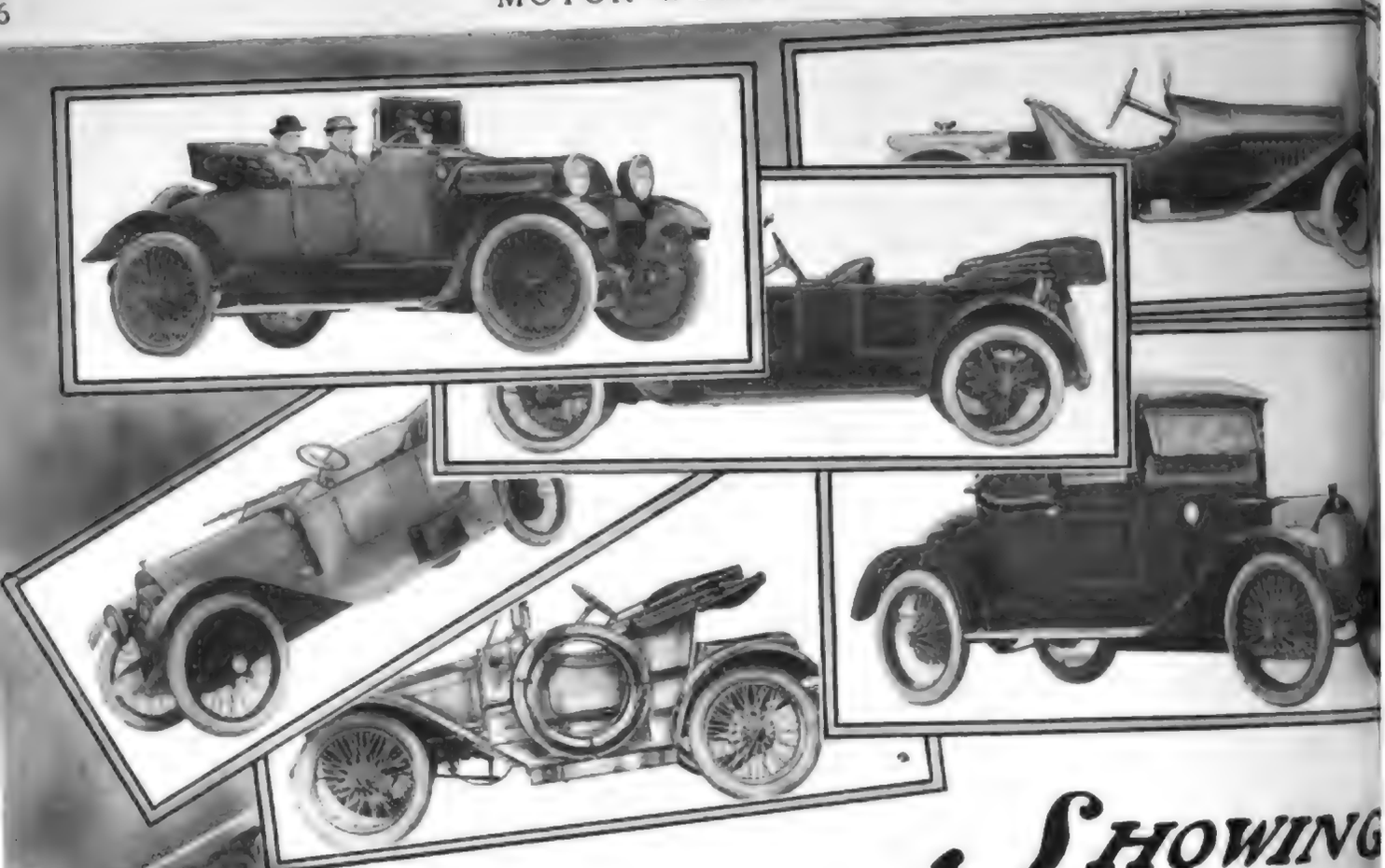
Weighs two pounds and a half.

Address all communications to

Nonpareil Horn Manufacturing Co.

73-75 Wooster Street, New York

Factory: 299 Ocean Avenue, Jersey City, N. J.



SHOWING

McCUE EQUIPPED

The above cars were centers of attraction at the New York Show —the public is becoming "wire wheel wise."

Here is the evidence—you can't discount it. **Wire wheels have come to stay.** Most notably, the McCue product is fast becoming a dominant factor in the field

Your prospective buyers want wire wheels—particularly McCue wheels—there isn't an argument they or you can raise discounting their practical worth. There **are** enough arguments **against** wooden wheels.

McCue Wire Wheels, aside from their tremendous resistance to radial and thrust shock, offer one great factor of safety—"**pocket book safety.**"

These wheels save tires—as high as fifty per cent.

Because they are light at the periphery and heavy at the hub—and so the road pound on tires at point of contact is negligible. Wooden wheels deliver a heavy blow on every inch of the tire at each revolution.

THE McCUE COMPANY

Google



SOME OF THE WIRE WHEEL AUTOMOBILES

At the Chicago Show these cars are again attracting the buying attention of the Middle West. Wire wheels are counted as big refinements.

Here's the illustration:

Take a hammer with a ten pound head—strike a piece of rubber continuously and see how soon it disintegrates. Then hold the hammer by the head and strike the rubber with the end of the handle—and you will wear your arm out—but not the rubber.

Remember, McCue wheels are detachable. We discard demountable rims as impractical. They add weight at the pounding point.

You specify wire wheels on the cars you sell and you will find yourself a leader in competition—that is, if competition don't catch the drift of this argument **first.**

Buffalo - - - New York

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B-T-K

PARTS OF QUALITY

TRANSMISSIONS, CLUTCHES and LEVERS

To fill all requirements in pleasure cars and light trucks

Contract Work, Gear Cutting

Brass, Copper and Nickel Plating

Our Engineering Department is at your service

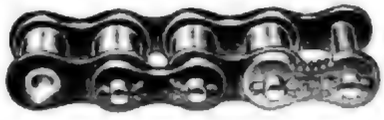
For further particulars address

AUTO PARTS MFG. CO., Dept. J. Muncie, Indiana





WHITNEY





The Most Practical Chain for Motor Trucks

Because the "Whitney" Cotter Detachable Chain can be easily separated at any link and lengthened, shortened, or repaired without the use of any special tool. This is of great advantage to truck builders, owners and drivers.

"Whitney" Chains are used by the leaders because they are strong, accurate, dependable and above all long lived. They are made right and they're made from the right kind of material, thus giving highest efficiency. When making replacements insist on a "Whitney."

"Whitney" Chains Are Built for Strains

THE WHITNEY MFG. CO., Hartford, Conn.







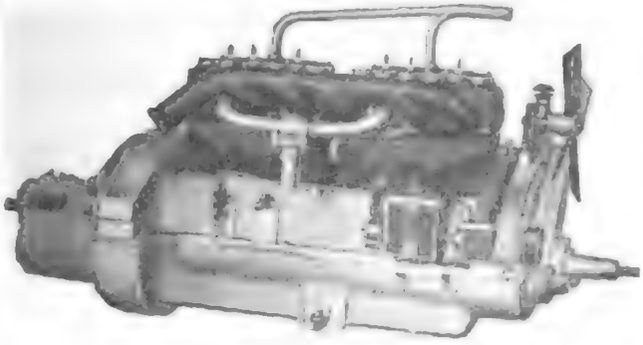




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Continental

The motor that gives a car a good name



The six-cylinder Continental unit power plant. Bore, 4¼ inches; stroke, 5½ inches. Built to accommodate any type of self-starter now made. Suitable for right or left drive.

Four-cylinders—20 to 70 H. P.

The Continental is responsible for more good motor car reputations than any other single product.

A common expression is this: "It must be a good car: The motor is a Continental."

The good name of the motor lends itself to the car. It is a guarantee of quality.

On the other hand, the manufacturer using the Continental does so because he realizes, more keenly perhaps, than his trade, the worth of this motor.

He uses it because he has a product worthy of it and he has enough pride in both to maintain the Continental standard throughout his own product.

Chicago Show Exhibit — February 1 - 15
Space 56, Coliseum Gallery

Continental Motor Mfg. Co.
DETROIT, MICHIGAN

Factory Representative.
K. F. PETERSON, 122 S. Michigan Blvd., Chicago.



Our departments of engineering and design co-operate with the men who build the car—combining their weight of experience in radiator making with the particular requirements of the designer of the automobile.

We will not, however, endanger the reputation we have made by making radical changes from established design. In standing by this resolve, we have, on rare occasions been obliged to lose business—something to be regretted, but none the less necessary.

Mayo Radiators are built to hold the engine at an even temperature—not too hot to endanger its usefulness, nor too cool to lose its efficiency. "Tolerance" in change of design is therefore liberal—but it has its limits.

If you, as the man who has sold the car, find yourself in "hot water" so to speak, with a leaky, inefficient radiator and a "superheated" customer, then be sure this car was not equipped with a Mayo Radiator. Dealers who sell cars Mayo equipped know that the radiators will stand up under any unfavorable condition short of a blow with a hammer or a bad collision.

Mayo Radiator Co.
NEW HAVEN, CONNECTICUT

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The Right Light For Your New Car

Why does gas lighting with an automatic lighter give you just as much convenience and more efficiency, reliability, and economy than any other lighting system? Here are the facts. Keep them in mind in deciding upon any system of automobile lighting.

Convenience

First of all, you say you want convenience in your lighting system.

Prest-O-Lite, when used in connection with an automatic gas lighter, offers you perfect convenience.

You can use gas in all your lamps, and you can light or extinguish all or any of the lights from the driver's seat, whether your car be moving or standing still. The flow of gas is automatically regulated to produce exactly the proper height of flame at all times. There are several good automatic gas lighters on the market. We make one—the Prest-O-Liter. It is about as simple as an electric doorbell. Any of our Service Stations will gladly demonstrate it to you. See it and judge for yourself whether any other system is any more convenient.

Then remember this **distinct advantage,** that should it ever be temporarily disabled, you are not left in the dark. You can light your **gas** lamps with matches, and YOU STILL HAVE LIGHT.

Reliability

Any lighting system on a motor car is subject to the heaviest jolts and shocks. Because of this, and because one must either carry or make his own light, automobile and house lighting are entirely different propositions.

Prest-O-Lite's absolute reliability is unquestioned. There are no delicate adjustments, connections, or complicated attachments to get out of order. Prest-O-Lite is so absolutely simple, it is trouble-proof. If, through carelessness, you allow your Prest-O-Lite to run dry, a Prest-O-Lite agency is close by, wherever you may be. Every city and town, and nearly every cross-road village, has its Prest-O-Lite exchange agency.

Here, then, is a system that every dealer understands; that never need leave you stranded on a country road; that never keeps you waiting for a factory expert to come and restore its usefulness; that is not affected by the heaviest downpour of rain.

In short, you have in Prest-O-Lite a system you can absolutely depend upon all of the time.

Efficiency

Exhaustive experiments have proven that the naked light of a ¼-foot acetylene burner gives 30 candle power without a reflector. The average **naked** light in other systems is 20 candle power or less. Weaker lights than Prest-O-Lite can give a blinding effect by the use of parabolic reflectors.

This principle was first employed in gas lamps, but was discarded as unsatisfactory because, while this type of reflector threw brilliant, concentrated rays far ahead it did not give the light **down on the ground** 10 to 50 feet ahead of the car, where you need it most, to give a perfect view of the road itself. Every experienced driver will tell you that Prest-O-Lite, with the reflectors now used in the gas lamps, gives all the light needed far ahead, and **in addition** gives a light immediately in front of the car which affords the driver a better idea of the ruts and bumps than he can get **even in broad sunlight.** This effect cannot be had from any lamps using parabolic reflectors.

Prest-O-Lite, as a practical road light for the driver, has no equal.

Economy

There is no other efficient lighting system that costs less to operate and maintain than Prest-O-Lite. The average cost of Prest-O-Lite operation, among over five hundred thousand actual users, is less than $10 per year. The user has no expense for repairs, for renewal of worn-out parts, or for adjustments, and its operation consumes no power and in no way interferes with the full efficiency of your engine.

Just one repair bill on any complicated, delicate lighting system might easily cost more than years of Prest-O-Lite service.

But even if Prest-O-Lite operation costs more than other lighting systems—instead of less—its reliability, its efficiency, its freedom from annoying troubles, should make it twice as valuable to any experienced driver.

No matter what self-starter is on your car, your lights should be gas lights. A self-starter is, after all, a highly desirable convenience, but not an actual necessity. Reliable lighting on your car is almost as essential as fuel. The disabling of a self-starter might mean, at the worst, your having to use the starting crank, but an accident to your lighting system may leave you helpless in the dark. But so long as you have Prest-O-Lite and matches you have light.

Almost any manufacturer will equip your new car with Prest-O-Lite and an automatic gas lighter, if you insist. If your car is now equipped with Prest-O-Lite, any of our Service Stations or any dealer can install an automatic lighter at small expense.

Before you decide on any gas lighting system, post yourself thoroughly by sending for a free booklet, "Light on the Lighting Problem," reprinted by permission, which gives all the facts of lighting prepared by one of the foremost authorities. By sending coupon below, it will reach you without charge by return mail.

THE PREST-O-LITE COMPANY
287 E. South Street, Indianapolis, Ind.

Please send free booklet, "Light on the Lighting Problem," to

Name .....

Address .....

The Prest-O-Lite Company, 287 East South Street INDIANAPOLIS, IND.

CANADIAN FACTORY AND GENERAL OFFICE, MERRITTON, ONT.
SERVICE STATIONS IN THESE CITIES: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Memphis, Tenn., Milwaukee, Minneapolis, New Orleans, New York, Omaha, Philadelphia, Pittsburgh, Portland, Ore., Providence, St. Louis, St. Paul, Minn., San Antonio, San Francisco, Seattle, Syracuse.
SERVICE STATIONS IN CANADA: Merritton, Ontario; Toronto, Ontario; Winnipeg, Manitoba.

Insist on Gas Lighting

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The Right Light For The Dealer

You Can Cash In On This Campaign

More than 10,000,000 readers will see Prest-O-Lite advertisements along the lines of the one on the opposite page. Among these readers are **your** patrons and **prospects.**

You'll want to read these advertisements carefully. Be prepared to reap what we are sowing.

How To Do It

You are familiar with the Prest-O-Lite Gas Tank Proposition—what it means to you as a dealer, and what it means to the hundreds of thousands users of Prest-O-Lite.

You should be equally familiar with the Prest-O-Liter. It is the final touch that adds unexcelled convenience to an efficiency and reliability that has never been questioned.

Consider the field open to you, the number of cars equipped with gas, to say nothing of the new cars every day. All these are your prospects.

The Prest-O-Liter

is a simple, efficient, automatic lighter for gas lamps that you ought to know about. It consists of the car's ignition battery or a few dry cells, a coil, wires to the lamps, an automatic reducing valve and a control valve and a push button on the dash. Turn the valve, push the button and the lamps are lit.

The Prest-O-Liter is easily and quickly installed and gives the user every convenience of the most complicated and expensive system, with greater reliability and economy in upkeep.

Send for Details

Every dealer should know about the Prest-O-Lite Campaign for **reliable automatic lighting.**

You'll want to be able to demonstrate and install the Prest-O-Liter, when the calls come.

We're ready to help you in every way and furnish literature for you to distribute. Use the coupon below, get in touch with the movement and be prepared to get your share when this business comes your way.

The Prest-O-Lite Company, 287 East South Street INDIANAPOLIS, IND.

CANADIAN FACTORY AND GENERAL OFFICE, MERRITTON, ONT.
SERVICE STATIONS IN THESE CITIES: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Memphis, Tenn., Milwaukee, Minneapolis, New Orleans, New York, Omaha, Philadelphia, Pittsburgh, Portland, Ore., Providence, St. Louis, St. Paul, Minn., San Antonio, San Francisco, Seattle, Syracuse.
SERVICE STATIONS IN CANADA: Merritton, Ontario; Toronto, Ontario; Winnipeg, Manitoba.

Insist on Gas Lighting

PREST-O-LITE COMPANY
287 East South Street, Indianapolis, Ind.

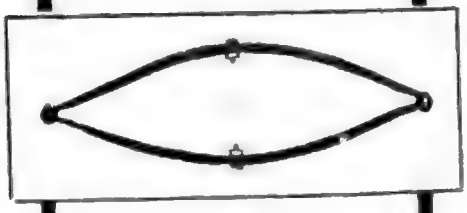
Kindly send full particulars on Prest-O-Liter and keep me in touch with your "Insist on Gas Lighting" Campaign.

Name .....

Address .....

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Penn Springs



Penn Spring Works

BALDWINSVILLE
NEW YORK

PENN SPRINGS are tested for resiliency and tensile strength far beyond any point that could be reached in every day service. They are guaranteed against fatigue and through the special grades of steel and methods of construction they will give service "plus."

Car manufacturers can make our engineering force part of their organization in the work of producing springs that are true in even load carrying, resilient and engineered to fit the particular car for which they are designed.

Add $10 to $25 Profit to Each Automobile Sale

Here's an easy way to pick up an extra Ten or Twenty Dollar Bill whenever you sell an automobile.

Just send us the name of the purchaser and we will endeavor to sell him an Edwards Private Portable Steel Garage.

That's all we want you to do—merely furnish us the name.

You Invest No Money or Time

It means $9.25 to $20 profit FOR YOU on each sale. And you've no money or time invested. Send us a list of all automobile owners in your locality, and on this plan you'll make a nice, clean profit—perhaps several hundred dollars.

The Edwards is far and away the most popular and widely advertised Private Garage. Our prices are much lower than others. And we've an excellent system of following up all names received. We won't miss any opportunities to close sales.

Write Us Now Send us your list of local auto owners at once, or we will be glad to answer any questions



Edwards Fire-Proof Garage

An artistic, fire-proof steel structure for private use. Gives absolute protection from sneak thieves, joy riders, fire, lightning, accidents, carelessness, etc. Saves time, work, worry and trouble. Comes ready to set up. All parts cut and fitted. Simple, complete directions furnished. Absolutely rust-proof. Joints and seams permanently tight. Practically indestructible. Locks securely. Ample room for largest car and all equipment. Made by one of the largest makers of portable fire-proof buildings. Prompt, safe delivery and satisfaction guaranteed.

The Edwards Mfg. Co., 709-759 Eggleston, Ave., Cincinnati, O.

IF YOU ARE INTERESTED IN

MOTORCYCLES

THE BICYCLING WORLD AND MOTORCYCLE REVIEW WILL INTEREST YOU

PUBLISHED EVERY TUESDAY AT 1600 BROADWAY, NEW YORK

TWO DOLLARS PER YEAR
SPECIMEN COPIES GRATIS

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The SPARTON



Dimensions:
Length, 12 inches
Flare, 7½ inches
6 Volts
Runson Dry Cells or Storage
Black enamel and brass or nickel bell

The First Electric Horn of Quality and Efficiency—At a Quantity Price

Big in Size—Big in Tone—Big in Value

To establish Sparton Value in your mind, compare it in tone, compare it in mechanical quality and efficiency; compare it from the standpoint of current consumption, appearance, size and finish, with the highest priced motor-driven horns. Then **compare prices.** The "Sparton" equals the best in quality, excels them all in durability and **its price is just about one-third.**

Quantity production alone makes possible "Sparton" Quality at "Sparton" prices. We have a capacity for producing 700 to 1,000 horns a day.

Two Styles Ready

Dash Type—In Black Enamel and Nickel or in Black Enamel and Brass.

Under-the-hood Type—In Black Enamel.

To Car Manufacturers

We are after "standard equipment" orders and can give immediate deliveries. We are setting a new pace for electric horn values. Write at once for sample horn and prices.

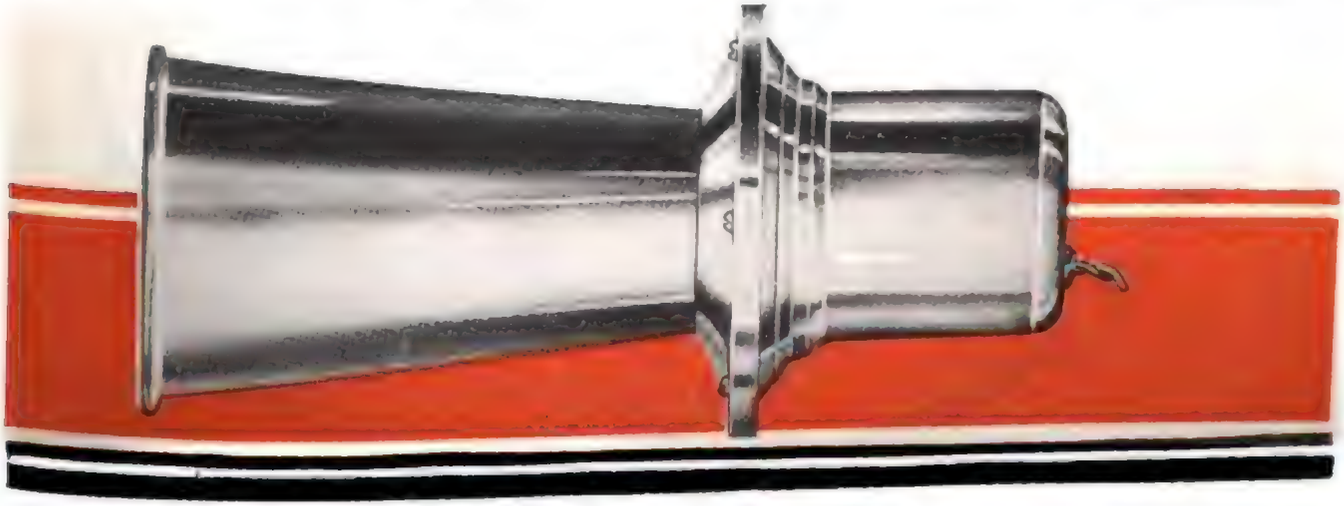
At Every Turn We Save You Profits That Every Other Manufacturer Must Pay.

We build our motors complete, manufacturing shafts and high speed bearings on high speed automatic machines; we stamp the laminations; wind both armatures and field coils; build a specially designed commutator; do all our own electrical work.

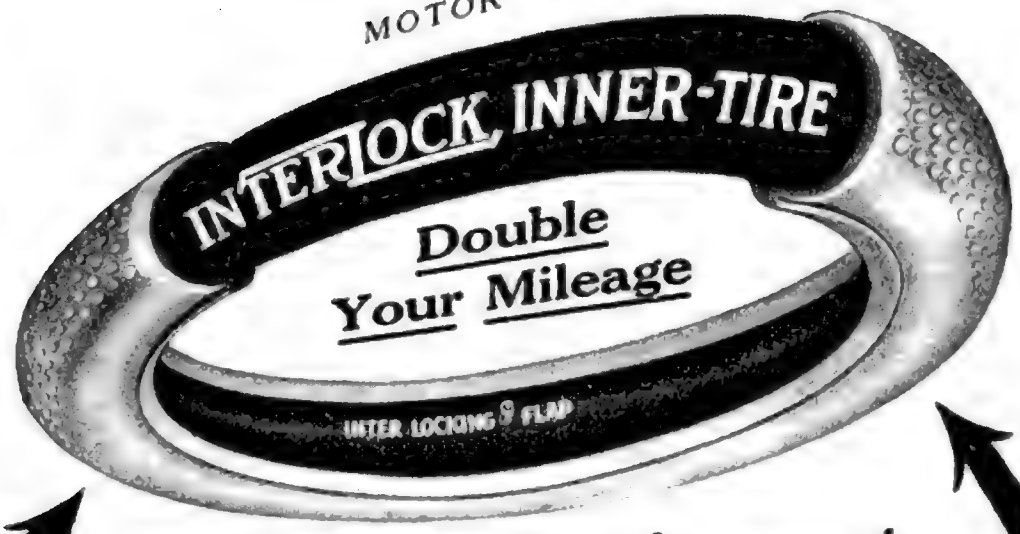
We stamp the bell diaphragm holders, front and rear, diaphragms, diaphragm armatures, motor covers, push button springs and casings.

For all these operations other horn makers pay a profit to someone else.

The Sparks-Withington Co., Jackson, Mich.



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The Only Tire Reinforcement That Prevents Rim Cutting or That Will Hold Rim Cut Tires

Tire experts concede that inside fabric breaks and rim cuts ruin 90% of the automobile tires before the rubber tread is half worn out.

Interlocks reinforce the sides of the tires as well as the tread, because they completely enclose the tube, and the interlocking flaps lock to the rim under pressure, giving ample excess fabric strength both to the sides and the tread.

Interlocks prevent blow-outs, rim-cuts and fabric breaks—protect the tube against punctures and free you from the dread and annoyance of tire trouble.

There is nothing experimental about ***Interlocks.*** They have proved their efficiency by the hardest kind of long, fast road tests under the official inspection of tire experts of the leading tire manufacturers.

The ***Interlock*** Inner Tire is a high grade, full round ***Endless Inner Tire*** (not an inner shoe or reliner) and is made like a tire—of rubber and fabric. It is easily placed in any pneumatic tire—between the outer casing and the inner tube—to strengthen the casing and protect the tube against puncture.

Write For Our Booklet

that gives complete description of ***Interlocks*** and valuable tire information about the care of tires, that will save you a lot of unnecessary tire trouble and expense.

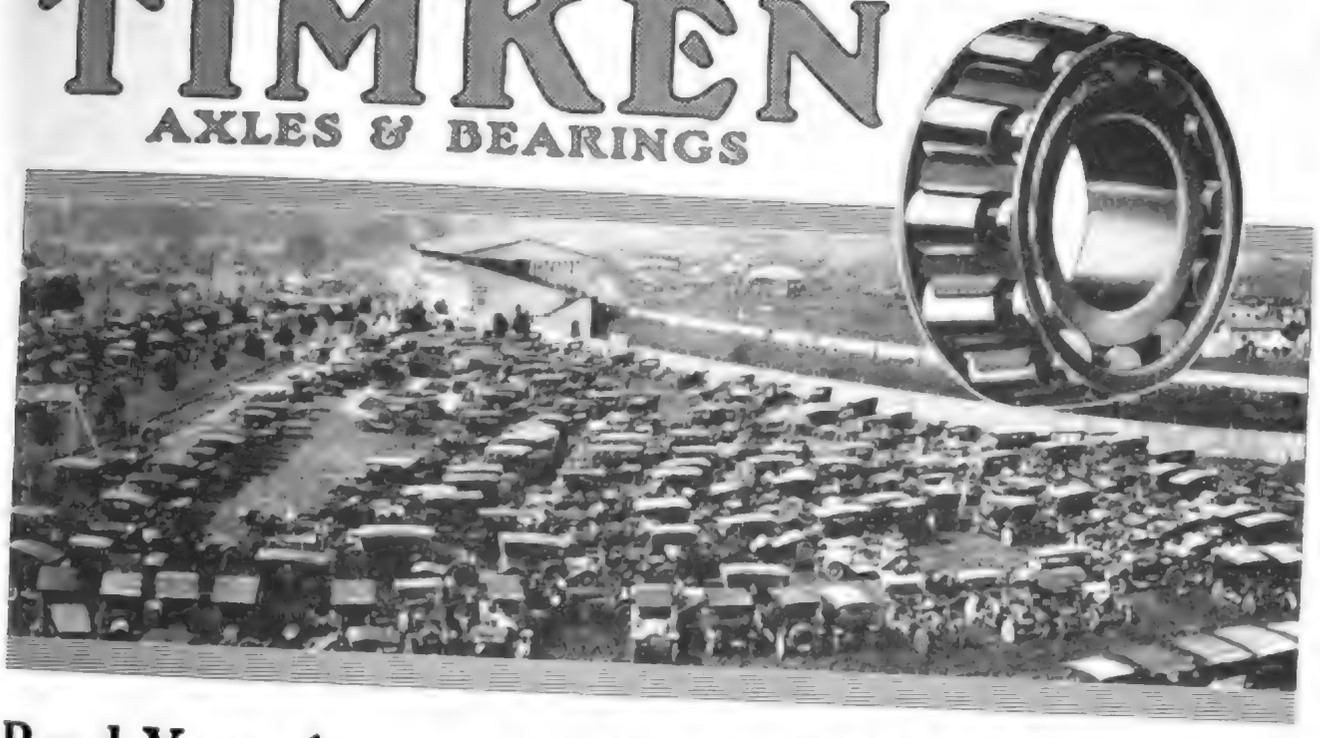
To Dealers: You will find ***Interlocks*** in all sizes, in stock at Beckley-Ralston Co., Chicago; Motor & Machinists Co., Kansas City; Bi-Motor Equipment Co., Boston; Fry & McGill Co., Denver; Western Auto Specialty Co., Iowa City, Iowa; and all leading jobbers of automobile supplies. Please give us the name of ***your*** supply jobber when you write. ***We want good dealers everywhere.***

Chicago Show Space, 208-9 ***Boston, Space G.-600***

Double Fabric Tire Co.
600 W. 9th Street
AUBURN, IND.

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TIMKEN
AXLES & BEARINGS



Read Your Answer in the Cars

DO Timken principles of axle and bearing construction work out in practise? Are their merits acknowledged by the leading motor-car builders?

These questions are natural and just. You have read the Timken stories of axle and bearing importance in previous advertisements.

You have felt, as you read, that Timken principles were right, that they must have proved right on many a steep hill and stony road.

Nor did you err, for hundreds of thousands of Timken-equipped motor-cars, pleasure and commercial, are daily demonstrating the worth of Timken principles and Timken construction.

At the points of severest service—there you are most likely to find Timken Equipment

Because front axles and the bearings on their spindles *must* stand up to the tests of every day travel and meet the emergencies, builders of good cars dare not take chances at these vital points.

On the right are listed nearly all of the cars using Timken Tapered Roller Bearings and Timken-Detroit Axles. Among them, you will agree, are most of the best known and highest grade cars made in the country.

All of the makes of cars listed here use Timken Bearings or Axles on one or more models, throughout or in part.

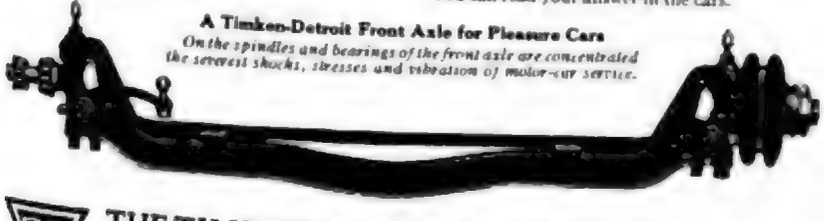
To be specific, 97¼% of all these cars have Timken Bearings at the points of severest service—on the spindles of the front axle.

In addition to that, 93⅓% of the entire list have Timken Axles or Bearings at all or some of the following points: rear axle, rear wheel bearings, differential and pinion-shaft bearings, transmission bearings, commercial rear axle and jackshaft, and their hubs and bearings.

Also 61⅔% of the pleasure cars and 72½% of the commercial cars listed at the right have Timken-Detroit Axles, front or rear or both.

Coming back, then, to the questions, "Do Timken principles of axle and bearing construction work out in practise? Are their merits acknowledged by the leading car builders?"

You can read your answer in the cars.



A Timken-Detroit Front Axle for Pleasure Cars

On the spindles and bearings of the front axle are concentrated the severest shocks, stresses and vibration of motor-car service.

THE TIMKEN ROLLER BEARING CO.
Canton, Ohio

THE TIMKEN-DETROIT AXLE CO.
Detroit, Mich.

Below are listed most of the cars using Timken Tapered Roller Bearings and Timken-Detroit Axles throughout or in part:

PLEASURE CARS

Abbott-Detroit — Amplex — Atlas-Knight — Bartholomew — Buffalo Electric — Cadillac — Case — Chalmers — Chicago Electric — Colby — Cole — Columbia — Columbus Electric — Crawford — Cunningham — Detroit-Electric — Diamond-T — Dorris — Edwards — Flanders — Franklin — Great Eagle (U. S. Carriage Co.) — Haynes — Kissel-Kar — Knox — Lexington — Locomobile — Lozier — Marion — Marmon — Mason — Mason-Seaman Taxicab — Matheson — Maxwell Special — Middleby — Mitchell — Moline — Moon — Moyer — National — Overland — —Packard — Palmer-Singer — Peerless — Pierce-Arrow — Pope-Hartford — Premier — Pullman — Rauch & Lang — Reo — Reo (Canada) — Russell (Canada) — Shaw Taxicab — Simplex — Speedwell — Stafford — Stanley Steamer — Stearns-Knight — Stoddard-Dayton — Stutz — Thomas — Tudhope (Canada) — Velie — Walker — Waverly Electric — Westcott — Winton — and many others.

COMMERCIAL CARS

Ahrens Fox Fire Engine — Alco Truck — American-La France Fire Apparatus — Atlantic Electric — Atterbury — Autocar — Avery — Baker Electric — Bessemer — Bronx — Cass — Commercial Truck of America — Dayton Auto Truck — —Detroit-Electric — Dorris — Federal — Four Wheel Drive — Garford — General Vehicle — Grabowsky — Gramm (Lima) — Gramm (Canada) — Gramm-Bernstein — Harrison — Hewitt (International Motor Co.) — Ice Mfg. Co. "A. I. C." — Kissel-Kar — Knickerbocker — Knox — Lansden Electric — Lewis — Lippard-Stewart — Locomobile — Lozier — Mack (International Motor Co.) — Mais — Marathon — Martin — Mather Funeral Car — Moeller — Mogul — Moore — Mooreland — Morgan — Oliver — Packard — Packers — Peerless — Pennsylvania R. R. — Pierce-Arrow — Pope-Hartford — Randolph — Rapid — Reliance — Reo — Rowe — Sampson — Schacht — Seagrave Fire Apparatus — Speedwell — Standard — Sternberg — Stewart — Stewart Iron Works — Studebaker — Toledo — Transit — U. S. Truck — Universal — Velie — Victor — Vulcan — Walker — Ward — Waterous Fire Apparatus — Waverly Electric — Webb Fire Apparatus — Wilcox — Woodworth — and many others.

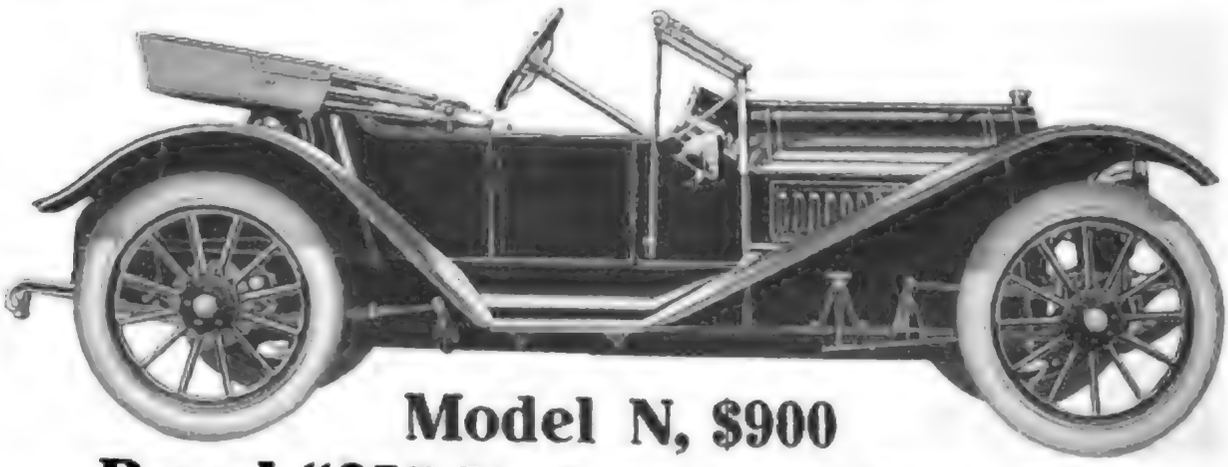
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You Will Find Them at the Shows—and Everywhere



Model T, $950
Regal "25" Underslung Touring Car

Tires Morgan & Wright, 32 x 3½ inches. Selective sliding gear transmission, three speeds forward and reverse. Motor, four cylinders cast en bloc; bore, 3¾ inches; stroke, 4½ inches; dual ignition; thermo-syphon cooling. Equipment includes nickel plated trimmings, electric lights with option of gas headlights, oil side and tail lamps, and Prest-O-Lite tank; electric horn; foot accelerator; tools and tire repair kit. Top, wind shield and speedometer, $75 extra. Price $950.



Model N, $900
Regal "25" Underslung Roadster

Tires, Morgan & Wright, 32 x 3½ inches. Selective sliding gear transmission; three speeds forward and reverse. Motor, four cylinders, cast en bloc; bore, 3¾ inches; stroke, 4½ inches; dual ignition; thermo-syphon cooling. Demountable rims (one extra free of charge). Equipment includes nickel-plated trimmings; electric lights, with option of gas headlights; oil side and tail lamps and Prest-O-Lite tank; electric horn; foot accelerator; tools and tire repair kit. Top, wind shield and speedometer, $75 extra. Price $900.

These popular Regal Cars and other Regal Models will be exhibited at the First Regiment Armory, Chicago, Space E 3, and all other important shows.

See them—hear the story of their success

Regal Motor Car Co., Factories, Detroit, Mich.

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RHINELAND BALL-BEARINGS

STANDARD PRODUCT of THREE COUNTRIES

GERMANY

FRANCE

"The Standard Product of Three Nations"

Strikes, Fire, Flood or War Cannot Stop Deliveries

INSURANCE for BUILDER and USER

UNITED STATES

95 D

RHINELAND MACHINE WORKS CO., 142 West 42nd St., N.Y.

MaBo Enamelling Works

BLACK ENAMEL AND COLOR WORK

Quick Deliveries

Enamelling of Automobile Parts a Specialty

We are in a position to quote prices to automobile manufacturers on large quantities.

MaBo Enamelling Works

JOHN L. BOWEN, General Manager

251 Ocean Avenue **Jersey City**

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PENNSYLVANIA Oilproof VACUUM CUP TIRES

THE only tires on the market that embody the "Big Three" of tire service: Anti-Skid, Oilproof, Long Wearing—all guaranteed.

First—to introduce the suction principle of positive skid prevention. *First*—to guarantee definitely, in print, full wearing capacity (4000 miles, under liberal conditions of car weights). *First*—to tackle and defeat the "oil disease" bogey.

The addition of the new feature—resistance to oil—to the already famous qualities of skid prevention and longer service, has elected these tires to the highest place in the opinion of experts and exacting motorists.

The intense interest aroused by Oilproof Vacuum Cup Tires is becoming more and more materially apparent. Our factory at full blast is working overtime to catch up with our orders before Spring.

Dealers: Now is the time to file your order. Early deliveries are not for those who delay. Our national publicity is rapidly diverting the tire demand into the Vacuum Cup channel.

Pennsylvania Rubber Co., Jeannette, Pa.

(Reorganized February 1st, 1910)

NON SKID V TRADE MARK

Pittsburgh, 505 Liberty Avenue
Cleveland, 1837 Euclid Avenue
Detroit, 254 Jefferson Avenue
Chicago, 1004 Michigan Avenue
Minneapolis, 34 S. 8th Street
Kansas City, Mo., 514 E. 15th St.
Omaha, 215 S. 20th Street
Seattle, Armour Building

PENNSYLVANIA RUBBER COMPANY OF NEW YORK
New York City, 1700 Broadway Boston, 149 Berkeley Street Dallas, 411 S. Ervay Street

PENNSYLVANIA RUBBER COMPANY OF CALIFORNIA
San Francisco, 512-514 Mission Street Los Angeles, 930 S. Main Street

An Independent Company with an independent selling policy

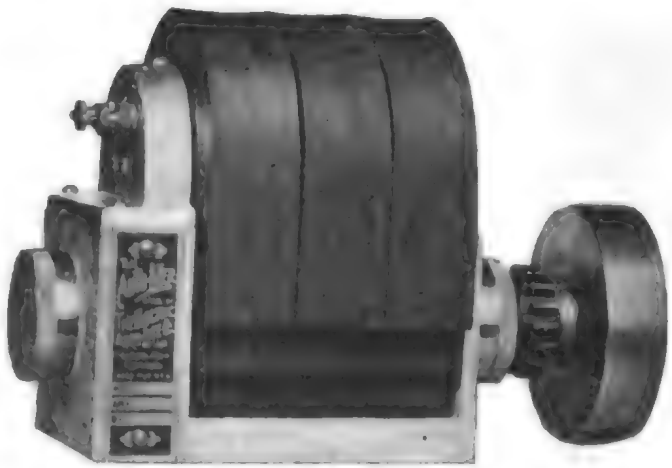
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Goodrich

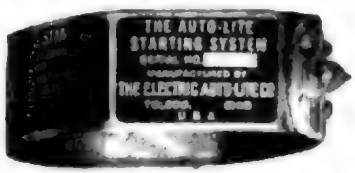
"AUTO-LITER"

The Positive Electric Starter and Lighter

There is no longer any question as to starting and lighting motor cars. We have overcome every difficulty and completely mastered the project. The Electric "Auto-Lite" is positive in its action at all times and under every known weather condition.



The simplicity of the "Auto-Lite" system is largely responsible for its success. There is nothing to get out of order. The two mechanically independent units are sturdy of construction and absolutely dependable in action.





Our starting motor turns the engine until an explosion occurs in the cylinders. It has proved as successful as the "Auto-Liter" outfit which has never failed in many seasons of service. It automatically disengages itself when the explosions do occur. Both are operated by a six-volt current, which eliminates excessive battery weight and other objectionable complications.

To manufacturers, dealers and prospective car owners our catalogue and descriptive literature are interesting and highly important. They treat the subjects of starting and lighting automobiles intelligently and exhaustively.

Our dealers' self-starter proposition is especially attractive. Write today.

THE ELECTRIC AUTO-LITE CO.

Main Office and Factory, Toledo, Ohio

BRANCH OFFICES: New York Kansas City San Francisco

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KLINE KAR

Chicago Show
Armory

KLINE KAR OWNERS ARE SATISFIED OWNERS

SEPARATE—

Two Systems **IGNITION** Bosch Magneto

Electric **STARTING** Equipment

Electric **LIGHTING** Dynamo

Four Speed Forward Transmission

PRICES

Model 4-30 - - - - - Three Body Types	$1750	Model 6-50 - - - - - Five Body Types	$2585
Model 4-40 - - - - - Five Body Types	$1985	Model 6-60 - - - - - Six Body Types	$3500

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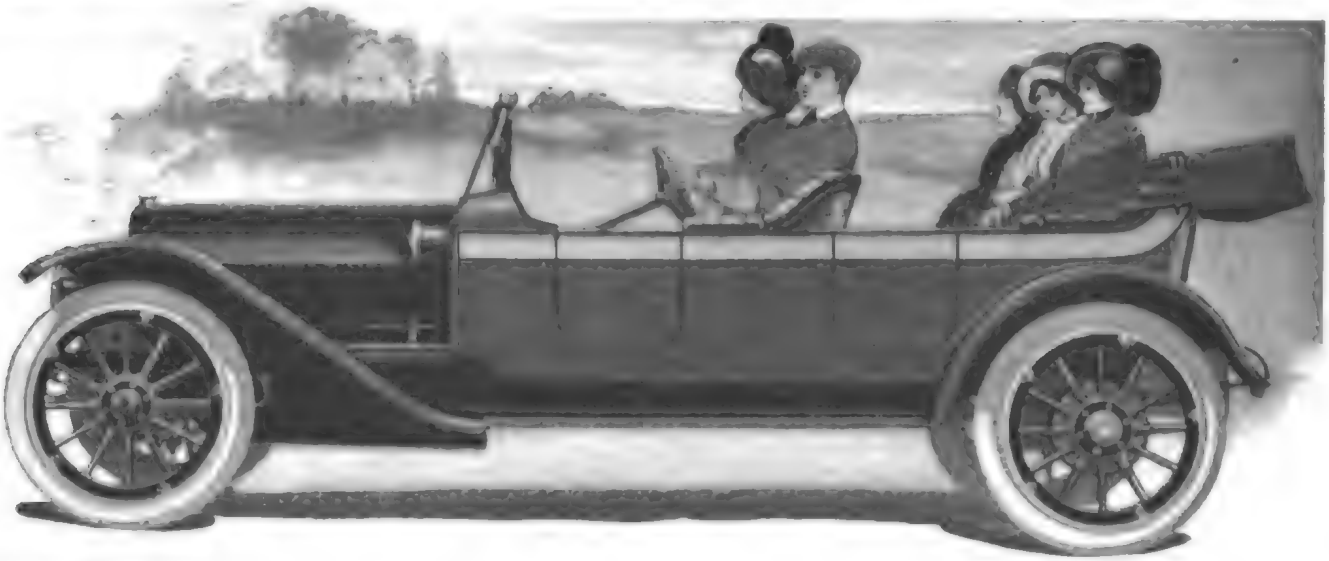
KLINE MOTOR CAR CORPORATION

RICHMOND, VA. Main Office and Factory YORK, PA.

RICHMOND, VA.

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Your Motor Car!



Electric Starter
Electric Lights
Center Control
Complete Equipment

Nyberg

Six $2,000
Four $1,650

YOUR MOTOR CAR is a stylish, comfortable car---one which any man may well be proud to own. A valuable addition to any dealer's line.

YOUR MOTOR CAR
Represents Real Value

It is not another sensation of the automobile world; it is not the car for which thousands have been waiting; it is not better than any car selling for twice as much.

Your Motor Car is just a beautiful, powerful car, designed by an engineer who has been identified with the automobile industry in America for fifteen years; built under his direction by an organization which has been trained to do things right at the lowest cost.

This engineer is Henry Nyberg, a graduate of the famous technical school at Malmo, Sweden; a practical mechanic who has worked out a plan by which you can buy Your Motor Car for at least 10 per cent. less than any other car of equal value.

This plan is based on conditions as they exist today. The automobile business has changed radically during the past few years. Certain features have been adopted as standard, so that it is no longer a difficult problem to determine the value of a motor car. Your Motor Car measures up to these standards in every way.

REAL MOTOR CAR VALUE
Is Determined by Many Factors

There are many good motor cars on the market now, but some of them offer you much greater real value, proportionate to the selling price, than others. A car may be right in every particular—design, material and workmanship; it may be manufactured in a modern factory; it may be sold at a reasonable profit —and still not be good value for the money.

The one big factor entering into the question of real value in a motor car—a point which many people overlook—is the conditions under which the car is built.

A car manufactured in a million dollar factory located on valuable land must have included in its selling price a share of this big investment. A car manufactured where living and labor are high must stand its share of that expense.

Your Motor Car is built in a town where labor conditions are unusually good; in a plain, substantial factory, designed for producing automobiles economically. The overhead expense on Your Motor Car is much less than that which most motor cars have to stand, and we are giving you the benefit.

YOUR MOTOR CAR
Itself Is the Proof

You have read many glowing statements regarding cars of all kinds, ranging in price form $500 to $5000. We could use a lot of superlatives in describing Your Motor Car, but it is not necessary. The car itself is the best proof we can offer of its unusual value.

Satisfy yourself on this point before you put up any money. Compare our car with others, selling at about the same price, bearing in mind that "Your Motor Car" is listed with complete equipment, including electric starter, electric lights, electric generator and storage battery, electric horn, top, windshield, speedometer, five demountable rims, nickel trimmings throughout, etc.

You should also bear in mind that the Nyberg SIX is a proven SIX, now in its third successful season. This is a point you should consider carefully when looking over the SIXES being offered for 1913. To be in line you want a SIX, but you cannot afford to take a chance on an experiment, and you will find that most of the medium priced SIXES are experiments.

You will NOT find "YOUR MOTOR CAR" at the Chicago Show. We have selected a better place to exhibit it—where you can sit in it—ride in it—or what not—"YOUR MOTOR CAR" is at our Chicago Branch, 2437-2439 MICHIGAN AVENUE

Nyberg Automobile Works

Northern Factory:
ANDERSON, INDIANA

Chicago Branch:
2437-39 MICHIGAN AVENUE

Southern Factory:
CHATTANOOGA, TENN.

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JONES
Speedometer

Based On A Principle



Centrifugal Force

Always Declares the Truth

THE truth is the wheel speed. The hand on the dial and the wheel on the road are one. They have a continuous line of metallic connection without gap or opening, branch or break. The hand of the meter is geared direct to the truth.

The wheel speed is recorded by centrifugal force---stable, fixed, unvarying for each speed. There is nothing to balance, nothing to counterpoise, nothing to compensate. Centrifugal force and speed are inseparably related.

The JONES SPEEDOMETER is not actuated or controlled, excited or impelled, induced or swayed by magnetic or temperature disturbances. Centrifugal force always tells the speed truth.

THE JONES SPEEDOMETER

Broadway at 76th Street, New York, N. Y.

PLANTS: BUSH TERMINAL, BROOKLYN, N. Y., NEW ROCHELLE, N. Y.

Chicago, 1430 Michigan Ave.
Boston, 109 Massachusetts Ave.
Philadelphia, 1427 Vine St.
San Francisco, 530 Golden Gate Ave.
Buffalo, 20 Goodrich St.
Los Angeles, 1229 S. Olive St.
Portland, 329 Ankeny St.
Seattle, 917 East Pike St.
Detroit, 872 Woodward Ave.

Google

Stewart Speedometer

MAGNETIC PRINCIPLE



Model F
$50

The Stewart Speedometer is built on the *magnetic* principle.

Two hundred and one out of two hundred and seven automobile manufacturers equip their cars with the *magnetic* speedometer.

Which is absolute evidence that the magnetic principle is the only practical one and proof that the Stewart is giving absolute satisfaction to users of motor cars.

Permanent service stations in all principal cities

(Stewart Speedometer Factory, Chicago, Ill.)

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SHELDON
AXLES

We couldn't improve on the construction of the Sheldon Axle so we are offering new features in design and equipment in order to maintain the position of Sheldon dominance.

Our new heavy service axle has the yoke arms bushed with Tobin bronze because it is at these two points that the greatest wear takes place.

Friction is reduced to a minimum by the presence of wide openings on the yoke.

Perfect lubrication and the minimizing of wear are brought about by numerous well-placed oil cups.

All these features are combined with Sheldon design and construction to make the greatest truck axle ever put on the market.

But not content with our product in itself, we are going one step further and we offer with our 1913 axles the following bearing equipment:

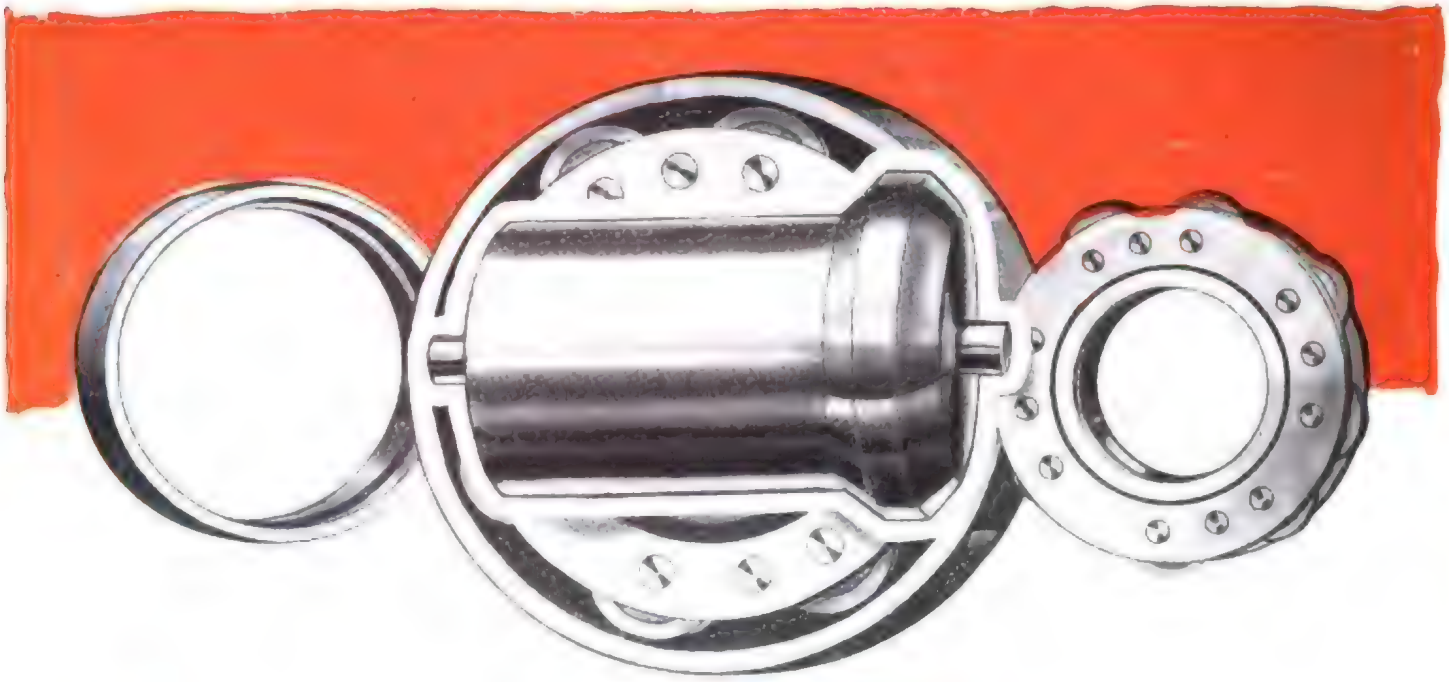
Standard Tapered Roller Bearings.
Bower Straight Roller Bearings.
New Departure, Rhineland, F. & S. Hess-Bright or any standard Double Row Annular Bearings.
Single Row Annular Bearings can be supplied without difficulty by using spacers.

This combination of the Sheldon Heavy Service Axle with a choice of any of the world's best bearings should not be overlooked by the truck manufacturer who wants the best.

SHELDON AXLE CO.
WILKES-BARRE, PA.

CHICAGO BRANCH 49 East 12th St.
DETROIT BRANCH 1115 Woodward Ave.

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Bower Roller Bearings

Right in Design Right in Quality Right in Service

A BEARING is only a small thing and yet it has a vital and important relation to the whole car. It affects service, affects fuel consumption, affects tire economy, affects power, affects ease of repair and adjustment.

As automobiles become more refined, as engineers pay closer and more scrutinizing attention to details the sale and use of Bower Roller Bearings increases.

For engineers, and all who deal with the public, realize that the less you leave for the public to do in the caring for a mechanical device of any kind the greater is the certainty of giving complete satisfaction.

And the use of Bower Roller Bearings entirely eliminates the necessity of one kind of adjustment that must be made when other types of roller bearings are used.

Bower Roller Bearings are non-adjustable radially. End play can easily and quickly be regulated without changing the RADIAL alignment; the RADIAL alignment never requires adjustment.

The body of the roller carries the RADIAL load; one end of the roller carries the end thrust, independent of the RADIAL load. Thus increasing the RADIAL load does not increase the end thrust; nor does increasing the end thrust increase the radial load.

To accomplish this in a single bearing unit without combining the radial and end thrust in a single element, is to achieve the highest type of roller bearing efficiency—and that is exactly what we claim for the Bower.

Every Bower claim is susceptible to proof—and the increasing use of Bower Roller Bearings—now in their fourth successful year—points unmistakably to the fact that we are "delivering the bacon."

Made in all regular standard sizes. Interchangeable with all the prominent makes of ball or roller bearings.

Get in touch with our engineering department, or write for full details.

We will exhibit at the Coliseum Annex, Chicago—glad to see you

BOWER ROLLER BEARING COMPANY, Detroit, Michigan

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KELLY TRUCKS

YOUR PROFITS

$ YOU CAN MAKE MONEY SELLING MOTOR TRUCKS.

$ YOU CAN FINISH EACH SEASON WITH INCREASING PROFITS.

$ TO DO SO TAKE ADVANTAGE OF THESE FUNDAMENTALS:

(1) YOU MUST HAVE GOOD TRUCKS TO SELL—AND GOOD SELLING TRUCKS.

(2) YOU MUST BE SUPPORTED BY AN **ORGANIZATION** WHICH WILL CO-OPERATE WITH YOU TO GIVE 100 PER CENT. TRUCK EFFICIENCY TO THE USER—THAT'S KELLY SERVICE.

(3) YOU MUST HAVE THE BENEFIT OF WORKING WITH A FACTORY SALES DEPARTMENT WHICH HAS BUT ONE OBJECT—THE SALE OF KELLY TRUCKS FOR YOU. THIS MEANS AGGRESSIVE ADVERTISING, INTELLIGENT PUBLICITY AND DIRECT SALES CO-OPERATION.

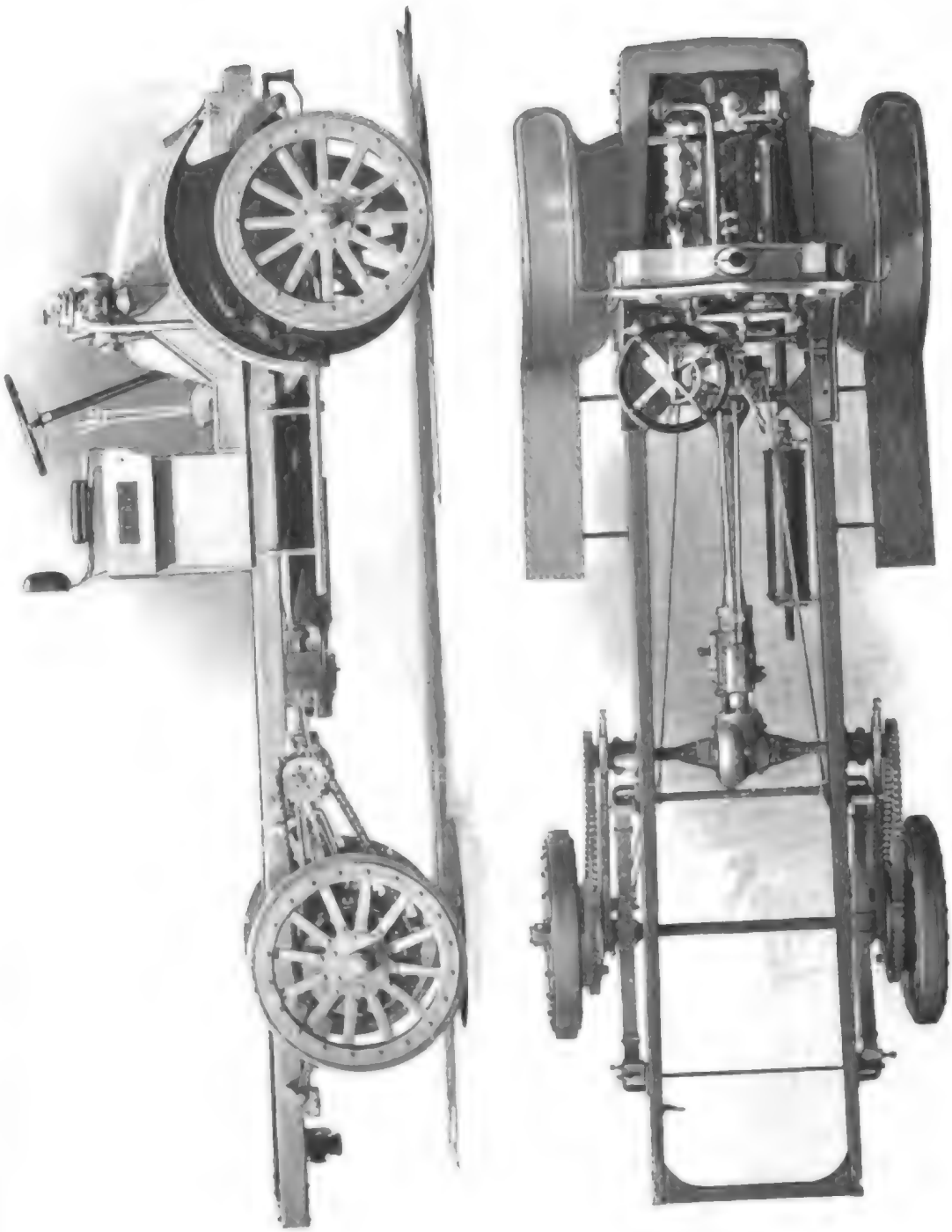
$ IN YOUR COMMUNITY WE WILL CREATE A DEMAND FOR KELLY TRUCKS, AND IF YOU ARE THE DEALER WITH THE BIG BRAINS **WIRE IMMEDIATELY AT OUR EXPENSE.**

ADDRESS: SALES DEPARTMENT

THE KELLY-SPRINGFIELD MOTOR TRUCK CO.

1026 BURT STREET, SPRINGFIELD, OHIO

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Side and plan views of the K-30 Chassis

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KELLY MOTOR TRUCKS

EXPERIENCE has taught THE KELLY-SPRINGFIELD MOTOR TRUCK COMPANY how to design and build the best high-efficiency motor transports. Experience has taught us that to build a big and permanent success in our chosen field of endeavor we must: first, build honestly and well; and second, equip with service facilities at factory, at our branch houses and at our agencies throughout the country so that Kelly motor truck users may be assured, as nearly as possible, 100 per cent service satisfaction for years after our product becomes their property.

The prospective buyer of motor truck equipment, in this era of enlightenment—be the installation one or a half-hundred chasses—realizes that when he has found the best designed and best built equipment, his responsibility to himself, or the corporation he represents, is but half discharged. In reality it is less than half discharged.

The buyer must go under the surface of things. He must go deeper than the mere chassis.

Is it the product of a thoroughly responsible manufacturing corporation—responsible both financially and morally?

Are the men who designed and who manufacture the product masters in their respective departments?

Are they able and always willing to back up their product to the limit?

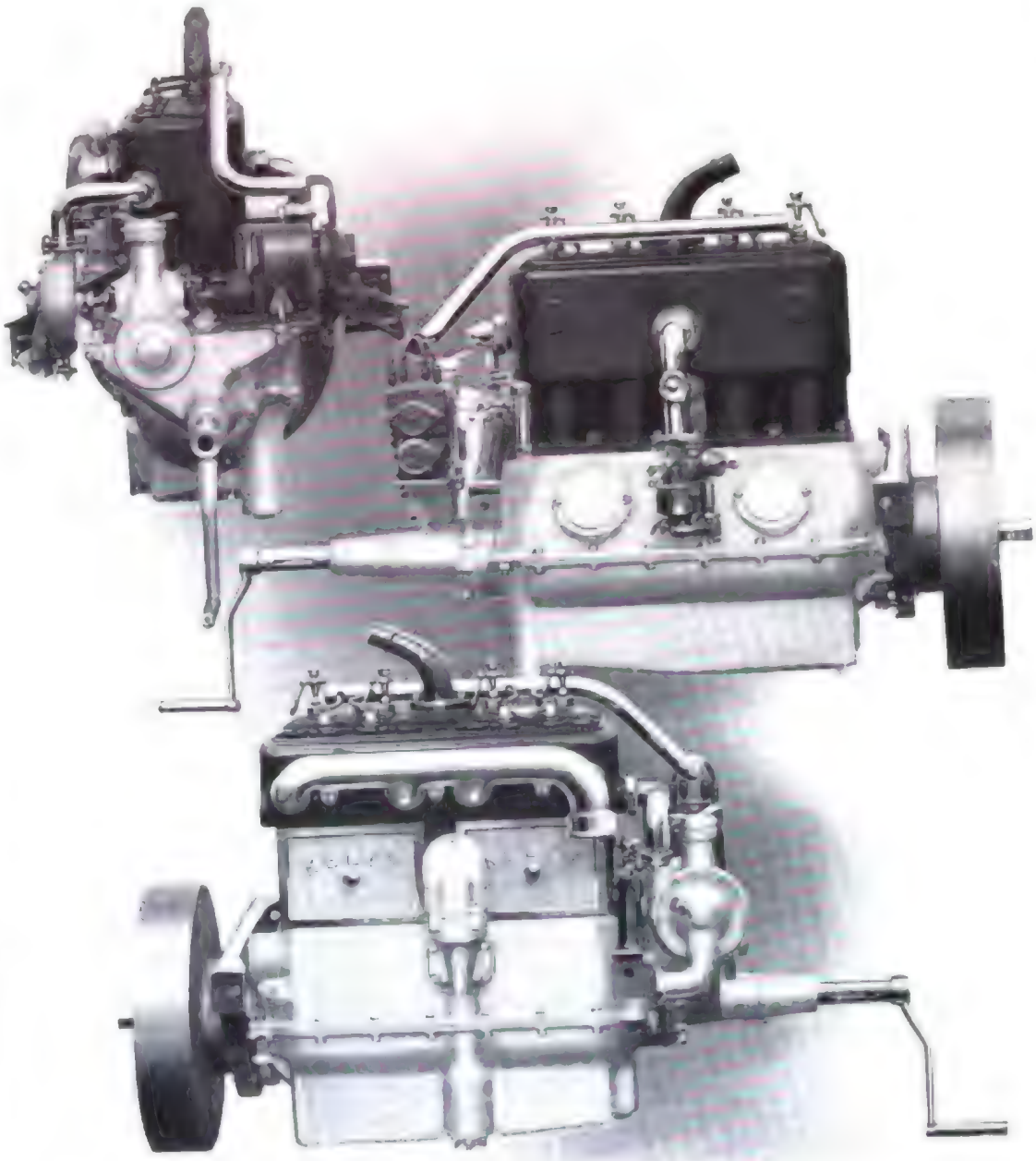
What are the manufacturer's facilities in the territory throughout which the truck, or trucks, are to be operated, with respect to giving service—not merely for a month, or a year after purchase, but five or ten years thereafter?

We buy a pleasure car and, after one or two seasons' use, sell or trade it for a new car—a later model in which we take increased personal pride in the driving. The staying qualities, the lasting responsibility of the manufacturer is not so serious. But with motor trucks—our commercial servants—it is quite a different matter.

The motor trucks you buy to-day are expected to stand up and deliver high transportation efficiency for years to come. And why not?

The right selection now, as regards design, quality of materials, carefulness of scientific manufacture, the ability and willingness of the builders to stand with you

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Intake and Exhaust sides and front views of the K-30 Motor. Note that valve springs and stems are completely housed and protected

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and for you during the years following your purchase, mean that you have made the great big step in the direction of satisfactorily mastering your problems of transportation.

You at once promote the advantage of your patrons by insuring quicker delivery than possible by older methods. And that advantage to your patrons is your advantage—your advantage multiplied.

Your radius of action trebles. You reach out and are able to conquer in avenues of new business where your earlier limited delivery radius meant impossibility.

Simultaneously with the adoption of motor trucks in your delivery system you reduce the costs per ton mile to such a degree that the economy of motor trucks presents such a decided item of advantage that you regret not having adopted them long ago.

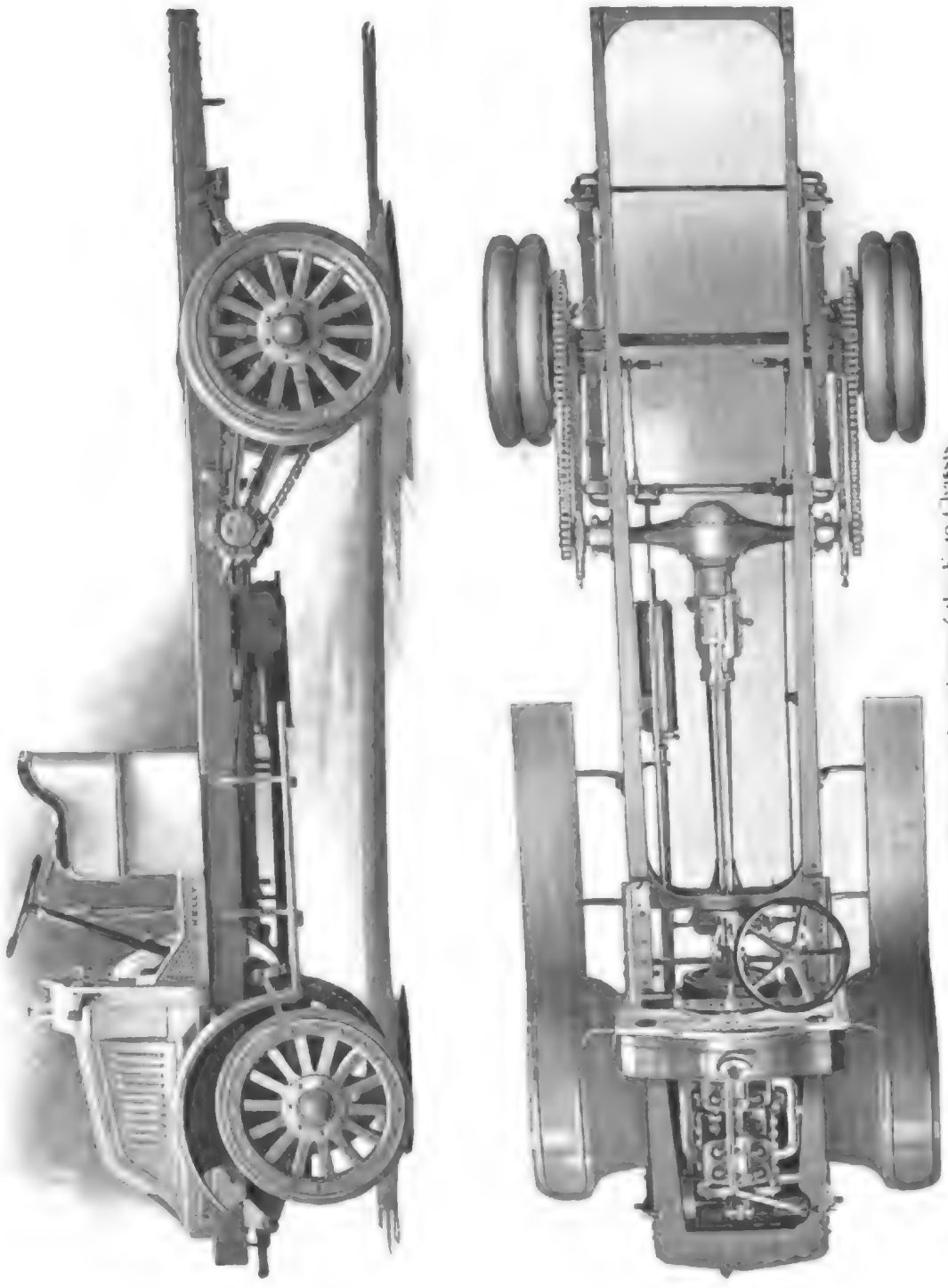
Did you delay earlier purchase in order that someone else might blaze the trail? Perhaps. In passing, however, we wish to thank many hundreds of those "trail blazers" whose patronage we have appreciated during the years since we, as pioneers in the industry, began the manufacture and marketing of motor trucks in America.

During these years we have learned many valuable lessons. We have learned much along lines of what *not* to do. We have been, and are, exclusive motor truck manufacturers. We do not build touring cars with motor trucks as a "side line." The manufacturing and marketing of high-efficiency motor transports is our business.

KELLY PRINCIPLES OF CONSTRUCTION

IT is a fundamental principle of mechanics that a structure designed to give under stress is much more durable than one which must resist pounding and vibration by its rigidity alone. There are, accordingly, two methods open to the truck designer: he may either attempt to make everything so hard and fast that it will resist, by its strength alone, the severe pounding to which a truck is always subject in daily service, or he may so design the machine that every part gives to the blow and cushions its effect by *not* resisting it. The Kelly design embodies the common-sense method represented by the *flexible* form of construction. This not only increases durability but permits the building of a lighter truck with higher load efficiency.

The Kelly motor is mounted on a three-point flexible suspension, the forward support consisting of a steel drop forging, the ends of which are bolted directly to the frame side members so that the crank case is relieved of the stresses usually imposed upon it. The third-point support at the rear is a large swivel joint which allows the frame to adjust itself to the inequalities of the road without imposing any strain on the motor bearings. The alignment of the latter accordingly is never disturbed, and there is no loss of power or wear on the bearings due to the twisting of the frame. The motor and clutch form one unit, while the countershaft, carrying the differential and transmission, form a second unit. The driving shaft is enclosed in a torque tube, and all relative movement is taken care of by a



Side and plan views of the K-40 Chassis.

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double universal joint between the clutch and the driving shaft. The forward end of the torque tube is attached to the central cross member of the frame by a double swivel joint, while the front ends of the radius rods are mounted on the countershaft on large ball and socket joints, and the rear ends of these rods at the rear axle are carried on double swivels. The three-point suspension of the motor, combined with this effective use of universal joints, provides for relative movement right from the crank shaft back to the wheels, so that the entire construction is flexible, and tends to *give* rather than to *resist* heavy shocks. On both the one and three-ton Kelly trucks pressed steel frames of liberal dimensions are employed, the one-ton frame being 4½ inches deep, while on the three-ton the channel section is 7 inches deep and ¼ inch thick. Only one cross brace is necessary in addition to the usual front and rear ends. There is, accordingly, a minimum necessity for drilling and riveting to the side members of these frames, and they will successfully withstand the continuous twisting to which a truck is subjected under heavy loads, without the tendency to "loosen-up" that is unavoidable in a rigid, stiffly trussed frame. This flexible construction of Kelly trucks permits the motor to deliver the maximum percentage of its power at the rear wheels. There is no waste through mis-alignment or binding of the crank shaft or other bearings, inevitable when they must resist the twisting of the frame.

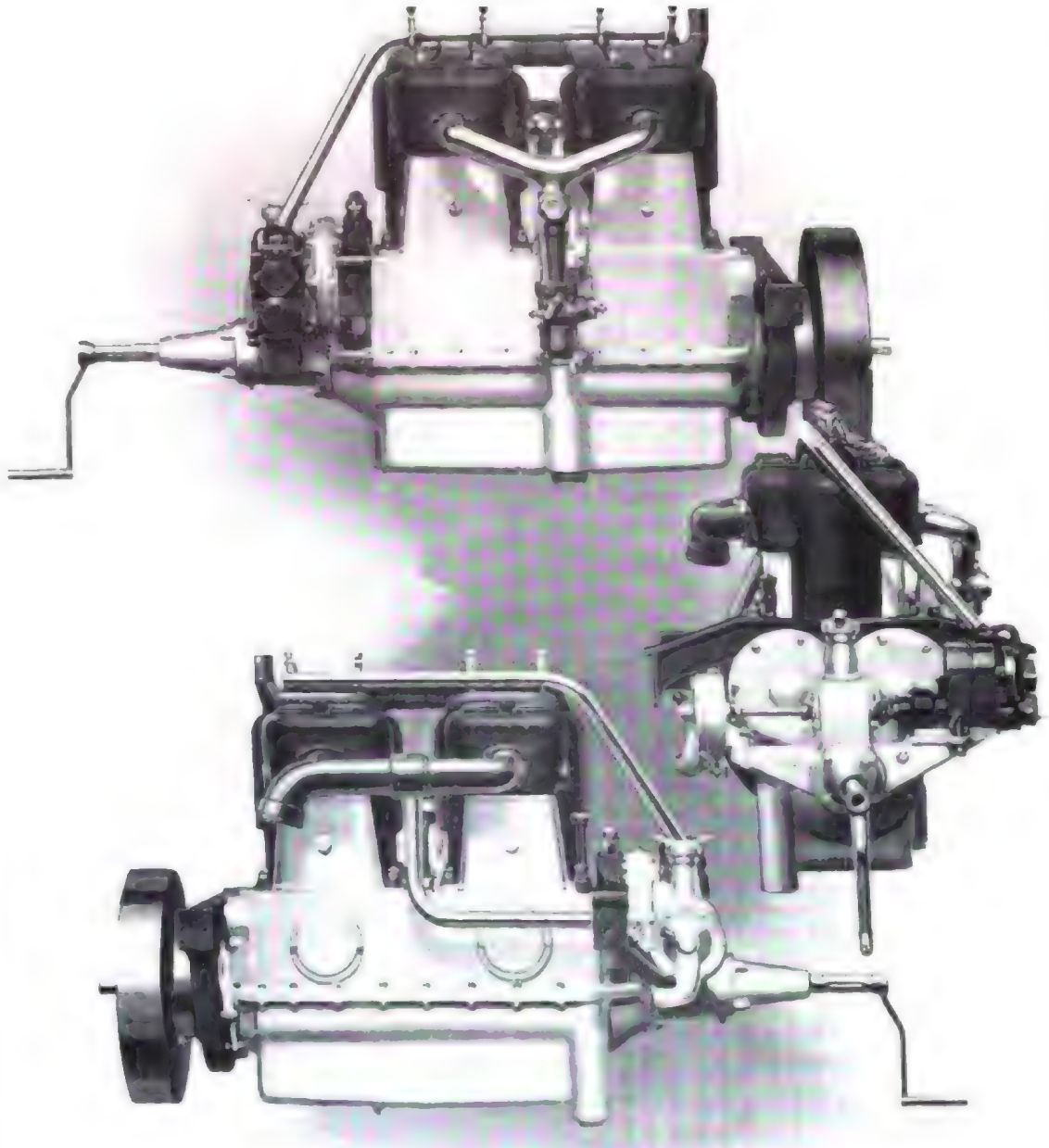
MATERIAL AND WORKMANSHIP

Correct principles are the very foundation upon which the successful motor truck must be built, but principles alone will not make an enduring and serviceable machine. They must be embodied in good material machined to the closest degree of precision. The high standards we have always maintained in the construction of every part of Kelly trucks have been responsible for their success quite as much as the fact that their design is based upon the correct principles. Parts that move together, or upon one another, must be finished in a manner ordinarily associated with the work of the jeweller if wear is to be avoided. As a matter of fact, jewellers' measurements have become crude by comparison with the fine standards adhered to in the making of many parts of Kelly trucks.

Machinery is ordinarily finished to what is termed commercial limits of precision, *i. e.*, as fine as they may be made by the usual methods, but in the manufacture of a machine that must endure the hardest class of service, such as Kelly trucks are subjected to in a great many different lines of business, the ordinary commercial standards are far from being fine enough. There are two hundred operations in the construction of a Kelly motor truck in which the limit of error is held to one-thousandth of an inch; twenty operations in which the limit of error is between one-thousandth and one two-thousandth of an inch, and thirty operations in which the permissible inaccuracy does not exceed one four-thousandth of an inch.

These differences are practically microscopic—they cannot be detected except by the finest precision measuring instruments. Such exceptional precision requires the use of expensive duplicating jigs and fixtures, and also the highest grade of skilled labor. That the maintenance of such a high standard is worth while is best

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Clean-cut simplicity of the K 40 Kelly Motor. The Power Plant of the Kelly Three-ton Truck

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evidenced by the success of Kelly motor trucks in service; wear is reduced to a minimum and when replacement of parts is necessary, the new ones fit absolutely.

The flexible unit principle of Kelly motor trucks is supplemented by an interchangeable unit construction which eliminates guesswork and rule-of-thumb methods in assembly.

LOAD DISTRIBUTION

The power-plant of the Kelly motor truck is placed under a hood, where both engineering principles and the needs of daily service indicate it should be. The value of a motor truck lies in its ability to carry the largest paying load, but to keep its efficiency up to the maximum, that load and the weight of the truck itself must be properly distributed. In the Kelly one and three-ton trucks eighty per cent of the total weight is on the rear wheels, twenty per cent on the front wheels. Placing more than eighty per cent of the load on the rear wheels increases the wear on tires without corresponding advantage. It is often claimed that placing ninety per cent, or more, of the total weight on the driving wheels will increase the traction, but experience has proven the contrary. In addition to the advantages of better load distribution and less wear on the tire equipment, the location of the motor under the hood makes every part instantly accessible.

KELLY WATER-COOLED MOTORS

With the experience of many years of truck building and the knowledge gained from hundreds of trucks in daily service, Kelly water-cooled motors have been designed to give the maximum efficiency and dependability under the most severe working conditions. Both the one-ton and the three-ton motors are of the slow-speed, long-stroke type, designed to work continuously under full load. The number of parts has been reduced to the minimum, and the design of the motor is extremely simple. High-grade materials make it possible to keep the weight down to the minimum. With the exception of the magneto driving shaft, all moving parts are enclosed. The oiling, ignition and cooling systems are all self-contained, while the motor is effectually governed not to exceed a speed of 1200 revolutions per minute on the one ton and 900 on the three ton. There is, accordingly, no opportunity for an unskilled driver to tamper with the motor, or abuse it by "racing," as this is prevented by the positive acting governor.

KELLY K-30 WATER-COOLED MOTOR

The dimensions of the one-ton, K-30 motor are 3¼ inches bore by 5¼ inches stroke. The four cylinders are of the L-head type in a single casting, which makes the motor compact. At 1200 revolutions per minute, to which the motor speed is controlled by the governor, the K-30 develops 25 horse-power.

The most important features of a gasoline motor designed for commercial use are the oiling, cooling and ignition systems, and these have been given particular attention. The lubricating system is entirely self-contained, consisting of an oil reservoir forming part of the lower half of the crank case. At the bottom of this reservoir is placed a high pressure pump driven through spiral gears at half the

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engine speed from the cam shaft. This pump forces oil at the rate of several gallons per minute through the hollow crank shaft to the main bearings, crank pins, connecting-rod bearings and pistons. It is commonly known as the dry-base system, as no lubricant is allowed to splash around in the crank case, all excess immediately finding its way back to the pump, which again circulates it. This gives a constant circulation of a large quantity of oil over all bearings while the motor is running.

Ignition is provided by an Eisemann automatic advance type magneto so that this important feature of the control is taken out of the driver's hands. A careless or unskilled hand cannot abuse the motor. Both the magneto and the centrifugal water pump are accessibly located at the forward end of the motor, where they are driven by a short transverse shaft and spiral gears. The oil sight-feed is also located at the front end of the motor, and is visible upon lifting the hood. With hood lifted, every part of the motor is made as accessible as if it were on a bench. This location of the magneto takes it away from the heat and the dirt, as well as the risk of being wet by either gasoline or water.

The radiator is of the tubular type which affords the most durable construction, and is built as part of the dash. It is carried on a flexible suspension which prevents damage consequent upon twisting of the frame or similar stresses. The centrifugal pump circulates the water around the exhaust valves and out at the tops of the cylinder heads and through large diameter tubing to the radiator. An aluminum fan, mounted directly in the center of radiator and driven by a belt from the fly wheel, provides a strong and efficient circulation of air, insuring proper cooling under all conditions of road, load and temperature.

KELLY K-40 WATER-COOLED MOTOR

The same principles of design and the same refinements of construction are followed throughout in the Kelly three-ton motor as in the K-30 model, practically the only difference being in the dimensions. The K-40 motor differs slightly in having T-head cylinders cast in pairs instead of the *monobloc* of the smaller motor. These dimensions are 4½ inches bore by 6½ inches stroke, and, at its normal speed of 900 revolutions per minute, to which the governor restricts it, it produces 38½ horse-power. Apart from the slight difference mentioned, all of its features of design, construction and control are identical with those of the smaller motor, and this also holds good for every other feature of the truck, the clutch, transmission and drive, all being built on the flexible unit principle. The dimensions throughout have been made extremely liberal for the load rating of the truck. It is a common practice to abuse motor trucks by greatly overloading them, and we have accordingly rated Kelly trucks at moderate capacities as compared with their actual carrying ability.

This does not mean that the Kelly one-ton truck is designed to carry two or three tons, nor that the Kelly three-ton truck is meant for five or six-ton loads, but both are designed to give reliable service day in and day out under the most severe conditions, and ample allowance has been made for the occasional excess loading which is unavoidable.

SPECIFICATIONS K-30 (1-TON) KELLY MOTOR TRUCK

NORMAL LOAD CAPACITY 2000 POUNDS

Motor	Four-cylinder, water-cooled, on three-point support.
Cylinders	3¾ inches bore by 5¼ inches stroke, L-head type in *monobloc* casting.
Horse-power	25 horse-power at 1200 revolutions per minute.
Lubrication	Self-contained automatic system, circulating oil constantly by gear-driven pump.
Ignition	Eisemann automatic spark advance high-tension magneto. A self-contained ignition system with which it is impossible to tamper.
Cooling	Tubular radiator, built in dash and mounted on flexible support. Gear-driven centrifugal pump at forward end of motor. Belt-driven aluminum fan back of radiator.
Governor	Vertical ball type direct connected with throttle.
Motor Control	By throttle only, magneto automatically taking care of spark advance.
Clutch	Aluminum cone faced with chrome-tanned leather, directly engaging fly wheel.
Transmission	Three-speed and reverse, selective type, built as unit with differential on jack shaft. Transmission shafts in vertical plane, giving access to gears without removing load or body.
Control	Left hand, with levers in center at driver's right.
Drive	Double side chains, heavy roller type.
Final Gear Ratio	6⅔ to 1.
Axles	Front: I-beam one-piece drop forging with nickel-steel steering knuckles and spindles. Rear: I-beam chrome-nickel steel forging 3 x 2-inch section.
Bearings	Hyatt high duty, and Standard roller bearings.
Springs	Semi-elliptic, 40 inches front; 42 inches rear.
Brakes	Both sets internal expanding type in drums on rear wheels. Dimensions, 16 x 2 inches.
Wheels	Artillery type, square spokes of 2-inch section, S. A. E. detachable rims.
Tires	36 x 3½ inches solid, front; 36 x 4 inches solid, rear.
Wheel Base	Standard, 120 inches; option, 144 inches.
Chassis Length	Standard, 15 feet 6 inches over all; optional, 18 feet 6 inches.
Tread	Front wheels, 56 inches; rear wheels, 60 inches.
Frame	Pressed steel channel section 7/32 inch thick, by 4½ inches deep. Length of standard frame, 9 feet; special frame, 12 feet, back of driver's seat.
Percentage Chassis Weight on Rear Axle	50 per cent.
Percentage of Full Load on Rear Axle	80 per cent.
Fuel Tank Capacity	15 gallons. Located under driver's seat.
Water Capacity	9 gallons.
Oil Tank Capacity	2¼ gallons.
Normal Road Speed	Standard, 15; option, 18 miles per hour—controlled by governor.
Price of Chassis	Complete with driver's seat, oil side and tail lamps, full set of tools and jack—$2000, f. o. b. factory.

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SPECIFICATIONS K-40 (3-TON) KELLY MOTOR TRUCK

NORMAL LOAD CAPACITY 6000 POUNDS

Motor	Four-cylinder, water-cooled, three-point suspension.
Cylinders	4½ inches bore by 6½ inches stroke, T-head, cast in pairs.
Horse-power	38½ horse-power at 900 revolutions per minute.
Lubrication	Self-contained automatic system, circulating oil constantly by gear-driven pump.
Ignition	Eisemann automatic spark advance high tension magneto. A self-contained ignition system with which it is impossible to tamper.
Cooling	Tubular radiator built in dash, and mounted on flexible support. Gear-driven centrifugal pump at forward end of motor. Belt-driven aluminum fan supported back of radiator.
Governor	Vertical, loose ball type, direct connected with throttle.
Motor Control	By throttle only, magneto automatically taking care of spark advance.
Clutch	Aluminum cone, faced with chrome-tanned leather, directly engaging fly wheel.
Transmission	Three forward speeds and reverse, selective type, built as unit with differential on jack shaft. Transmission shafts in vertical plane, giving access to gears without removing load or body.
Control	Left hand, with levers in center at driver's right.
Drive	Double side chains, heavy roller type.
Chains	1¼-inch pitch.
Driving Gear Ratio	11½ to 1.
Axles	Front: I-beam one-piece drop forging with nickel-steel steering knuckles and spindles. Rear: I-beam, drop forged, special Kelly design.
Bearings	Hyatt high duty, and Standard roller bearings.
Springs	Semi-elliptic, 48 x 3 inches front; 56 x 3 inches rear.
Brakes	Both sets internal expanding type in drums on rear wheels. Dimensions: service brake, 20 x 3 inches; emergency brake, 20 x 2½ inches.
Wheels	Artillery type, 2½x3 inches rectangular section, S.A.E. detachable rims.
Tires	38 x 5 inches single in front, 42 x 5 inches dual in rear.
Wheel Base	Standard 150 inches; options, 120 and 172 inches, or any intermediate length.
Standard Chassis Length	19½ feet over all.
Tread	Front wheels, 68 inches; rear wheels, 72 inches.
Frame	Pressed steel channel section ¼ inch by 7 inches deep, 3 inches top and bottom. Length of standard frame back of driver's seat, 12 feet, 3 inches; special frames, 9 feet, 10 inches; 15 feet, and 17 feet.
Percentage Chassis Weight on Rear Axle	50 per cent.
Percentage of Full Load on Rear Axle	80 per cent.
Fuel Tank Capacity	20 gallons.
Water Capacity	15 gallons.
Oil Tank Capacity	2¾ gallons.
Normal Road Speed	11½ miles per hour—controlled by governor.
Price of Chassis	Complete with driver's seat, oil side and tail lamps, full set of tools and jack—$3400, f. o. b. factory.

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UTMOST care has been exercised in the selection of highest quality materials for the manufacture of Kelly motor trucks. Special alloy steels which embody greatest resisting and wearing qualities are used throughout. By the employment of these expensive alloys minimum weight with maximum strength is the result attained. This big and important advantage is decidedly favorable to Kelly motor trucks.

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KELLY SERVICE

THE final test of the efficiency of a motor truck is service. The sale of a truck is only the beginning of the manufacturer's responsibility.

Do you realize what real factory service means to the man who sells a truck?

Kelly service is legitimate service in every sense of the word. We can give real service because we have built up the Kelly organization with that idea in view.

We operate well-equipped factory branches and service stations in the following cities:

Boston	Dallas	Chicago
Providence	San Francisco	Kansas City
Worcester	New York	Seattle
New Haven	Philadelphia	Los Angeles
Cleveland	Birmingham	

Every city and town in the country is within a few hours' reach of these service stations. The necessary equipment for



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any repairs can be dispatched to any dealer without an instant's delay, and delivered within a few hours. The advantage of this arrangement can be best realized by those who have often been compelled to wait many days for the arrival of repair parts from a distant factory.

KELLY SALES HELPS

OUR sales and advertising department is designed and manned to sell Kelly trucks for you. We will help you in every way possible.

We begin our co-operation with the issue of advertising and sales proposition ready for you. We will supply more beginning months to promote your sales.

Every member of our sales and advertising department has had long experience in selling. They know how to help you sell the business you get from us.

We will co-operate with you in every way possible.





THE LAST WORD

IN conclusion we urge upon you the importance of telegraphing at our expense if you, as THE live Dealer, want the best motor truck account in America.

We are prepared to go the limit with you to get the cream of the motor truck business in your territory.

Don't wait to see us for the Chicago or any other motor truck show.

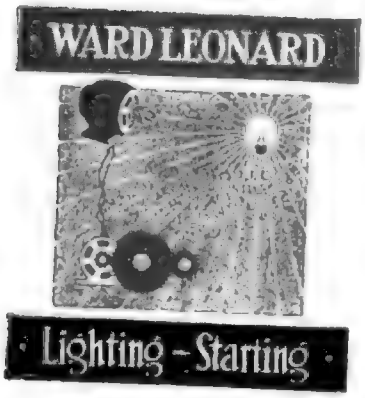
Telegraph immediately at our expense and arrange to have territory assigned you.

THE KELLY-SPRINGFIELD MOTOR TRUCK CO
1026 BURT STREET SPRINGFIELD OHIO

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The Ward Leonard System

With Real Automatic Control



The perfection of the Ward Leonard System is due to the fact that Ward Leonard is electrical and mechanical experience combined.

The latest and best forms of heavy electric hoisting machinery are operated under Ward Leonard Systems of control. Hoists which employ as high as 1500 H.P. and which are driven vertically at the rate of 40 miles an hour are perfectly controlled by Ward Leonard Systems.

This control results in a marked increase of the output, greater economy and absolute safety.

Steel rolling mills in Germany alone save millions of dollars because their immense rolls, a single set of which frequently requires 12,000 H.P. to operate, are electrically controlled by Ward Leonard Systems.

It is apparant then, that all problems of electrical control in the case of mills, heavy machinery, and the like, have been satisfactorily met by the Ward Leonard Systems of Control.

The application of this specific knowledge of electrical and mechanical control to the automobile industry has made it possible for the Ward Leonard Company to offer motorists and manufacturers a starting and lighting system that is efficient, simple and reliable because it is based on scientifically correct principles of control.

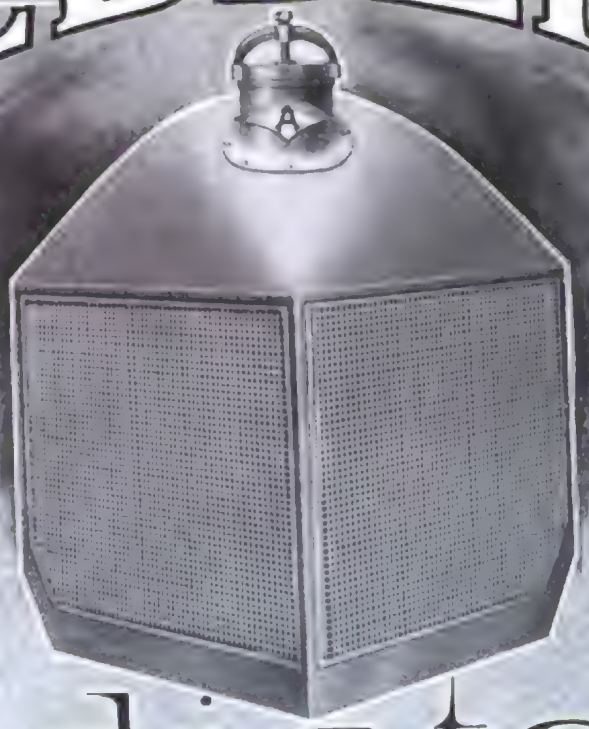
Time and test have proved our claims. Our system is the result of a quarter of a century of evolution and our experience is your guarantee.

WARD LEONARD ELECTRIC CO.
BRONXVILLE, N. Y.

WARD LEONARD

FEDDERS

Square Tube



Radiators

Water All Around

The water channels in Fedders Square Tube Radiators are vertical and horizontal, open on all four sides, guaranteed to give maximum cooling surface.

This form of construction is right and logical—a fact admitted and acted upon by engineers of many of America's best known cars—and in these days the wise manufacturer takes no chances of endangering the popularity of his car by gambling on parts of problematical value—more especially radiators.

Dealers who sell cars equipped with Fedders Radiators can repair broken tubes with a pair of tinner's irons. No expensive delays in returning to the factory.

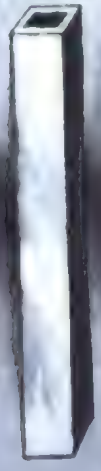
Highest cooling efficiency, long life, easy repairs—this is the whole story of Fedders supremacy.

Note that while we specialize on Square Tube Radiators we are also equipped to produce radiators of any type and in any quantity over specifications furnished. Get in touch with our engineering department.

FEDDERS MANUFACTURING CO.
Buffalo, New York

Repaired At Home





Highest Efficiency-Longest Life

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Schafer Ball Bearings Insure

Smooth and Silent Operation

THE CAR THAT RUNS SMOOTHEST lasts longest—the noiseless car conserves its power and efficiency indefinitely. Smoothness and silence are the indications of frictionless operation—a prime necessity in motor car endurance. Friction means rapid and costly depreciation. No mechanism can long endure when the bearing points are centers of discord and grinding wear.

SCHAFER BALL BEARINGS offer the best solution of the friction problem. They are the anti-friction bearings par excellence. Although in theory friction always will develop where steel moves over steel, Schafer Bearings reduce the coefficient to so low a degree as to be practically negligible. They are the highest grade and finest quality of ball bearings made in the world today.

THE CHROME STEEL used is of special analysis, close in grain and fine in texture. The balls are accurate in dimensions and sphericity, uniform in size to within one ten-thousandth of an inch. We were first to employ 95 per cent. of balls in the raceway. Our cage design has not changed in years, for it was correct in principle from the first. Schafer Ball Bearings are standard equipment on the best cars of Europe and America. Of course, there's a reason.

BARTHEL, DALY & MILLER

42 BROADWAY NEW YORK CITY

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PATHFINDER

Official good roads car
Sensation of the shows

THERE is a big human interest back of the wonderful achievements of the Pathfinder 40—the official good roads car of the A.A.A. and U. S. Government.

YOU will be attracted to the Pathfinder because of its proved ability to duplicate for you such a wonderful performance as the one-season triple transcontinental tour.

WE offer free to dealers who are interested in long distance touring, an A. A. A. strip map of any one of the official trails surveyed by A. L. Westgard. Besides their intrinsic worth, these maps have an historical value that should appeal to you. Get one free by asking.

THE MOTOR CAR MFG. CO.
Indianapolis, U. S. A.

NEW YORK CHICAGO

Exhibiting at the Armory





Two questions a Dealer should ask himself when considering the representation of a Motor Truck Manufacturer :

Which Truck will give the most satisfaction to my customer ?

The truck which is built to perform the service expected of it, and which possesses exclusive points of economy and superiority.

The A&R Motor truck represents accumulated results of eight years careful study and scientific development with the most severe road tests. Through these tests, it has been demonstrated that the A&R truck is more than capable of meeting every possible condition.

A&R CONSTRUCTION

"Study the lines" :—They represent power and efficiency — far in excess of their rated load capacities, combined with minimum weight and great strength. Many features of the A&R truck are exclusive—collectively they represent the highest type of motor vehicle construction.

CAPACITY

Heavy service—three, four and five tons.

Which Company will give me the best co-operation, not only in the sale, but in rendering service to my customer ?

The Company which is firmly and substantially established; thereby assuring permanence, situated to render service to owner and dealer, and willing to co-operate with him in compelling attention and consideration for the truck through publicity.

The Abendroth & Root Manufacturing Company, is an engineering corporation, whose products have been recognized standards throughout the engineering world for over forty-five years, thereby insuring sterling quality and dependable service for every A&R truck.

A&R SERVICE

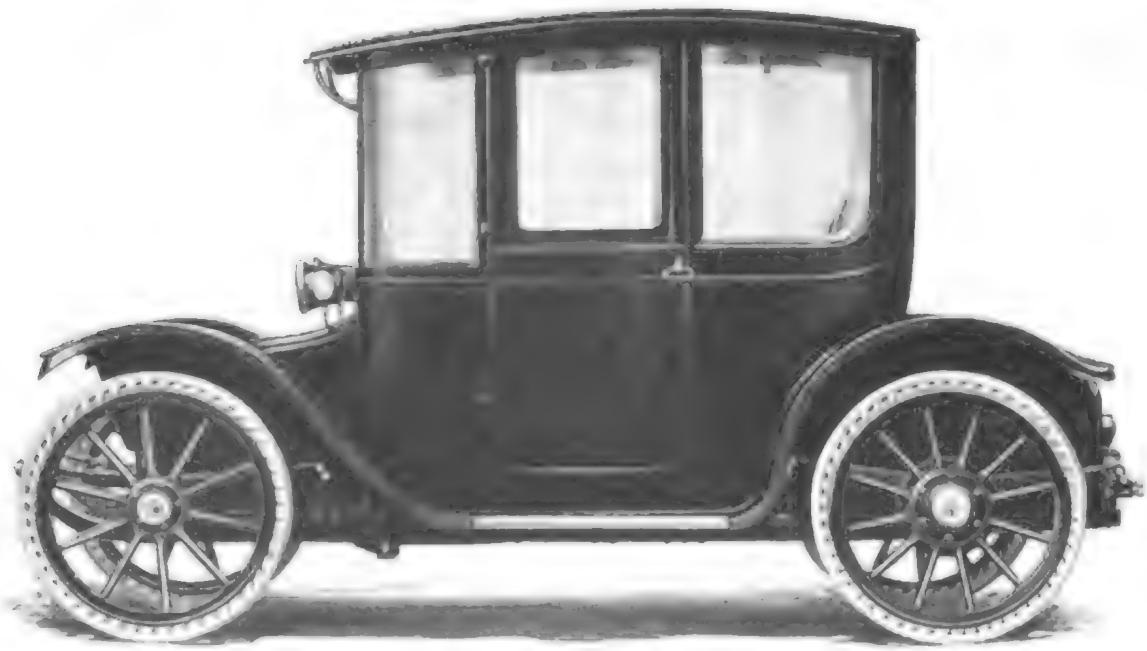
A thoroughly equipped factory at Newburgh, N.Y., in close proximity to New York City, has a factory service department, where the most efficient co-operation is available to every dealer and purchaser of an A&R truck.

WE have an interesting proposition, with a generous margin of profit, for a live dealer in your territory. The demand for high grade motor trucks, already exists, and will be further stimulated by our advertising assistance, and co-operation with the dealer. Write or telegraph us now for more complete information.

Abendroth & Root Manufacturing Co.

NEW YORK CITY, 48 Church Street **Factory: Newburgh, N. Y.**

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Some of the most desirable territory in the Middle West and West has not yet been closed.

That means several big opportunities for dealers of standing and ability. You'll find full details—and the car itself—at Space 8, Basement of the Annex, Chicago Show.

Century
ELECTRIC

is a car of distinguished personality. A car of superb proportions and simple elegance.

The low, underslung body, scientifically suspended on long, flexible springs, makes it peculiarly an easy riding car and one that sticks close to the ground. It almost can't overturn, or skid.

There isn't anything finer in the Electric field.

Don't fail to see it and get the dealer proposition.

CENTURY ELECTRIC CAR COMPANY

1157 Woodward Avenue Detroit, Mich.

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MATHER

Scientifically Heat-Treated Springs



THERE is no better example of the advancing strides being made in the Automobile and Motor Truck Industry, than is shown by the demand of the Manufacturer that all vital steel parts be **Scientifically Heat-Treated.**

It is an obvious fact that little or no effort has been made by the Old Line Spring Shops to enhance their product by intelligent Heat-Treatment—due partly for want of proper equipment and partly to indifference. This fact, more than all others, is accountable for the large percentage of broken and soft springs, of which the Motor Car Manufacturer now complains.

Our plant has been designed and equipped expressly with a view of **Heat-Treating Springs Scientifically.**

The Electrical equipment used throughout our entire plant, controlling the necessary heats, is considered by far the most efficient obtainable; and is the type most generally used for laboratory work.

We guarantee every spring turned out by us to be Scientifically Heat-Treated.

A visit to our plant will convince you that we can materially reduce your spring troubles.

The Mather Spring Company

Toledo, Ohio

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To the DEALER

These instruments embody quality that insures integrity of speed and time measurements year in and year out. This quality then means right design, accuracy in machining and assembling and metals that must conform to the high laboratory standards set for them.

In these days of strenuous business competition, quality is sometimes sacrificed to increase publicity and to lessen sales resistance. Advertising overhead charges when carried to excess, must be taken from quality of product.

Hoffecker and Waltham products are conservatively, but effectively, advertised in that this publicity goes direct to, and exclusively to car owners and prospective owners.



HOFFECKER SPEEDOMETERS

HOFFECKER IS TO A SPEEDOMETER WHAT WALTHAM IS TO A TIMEPIECE

MANUFACTURER and OWNER



Our advertising is economical and it goes right to the people to whom dealers can talk, knowing that we have told the story in advance.

And through the elimination of scattering advertising we can and do conserve money that goes *into* the products---not into talking inordinately *about* them.

Hoffecker Speedometers and Waltham Time Pieces are the best that money can produce---they are sold at prices modestly consistent with their known worth in accuracy and constant service.

DEALERS—Investigate, prove all things we claim and then help your trade to more and better speed and time recording service than they have been taught to expect.

WALTHAM TIMEPIECES

HOFFECKER IS TO A SPEEDOMETER WHAT WALTHAM IS TO A TIMEPIECE

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TO OWNERS *of* CONTINENTAL

RIMS  RIMS

THE RIM BASE OF

STANWELD

RIM No. 30

Will Fit the Felloe Band of Either the Continental or Standard Universal No. 3 Rim

SEE OPPOSITE PAGE

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Rim Base of STANWELD Rim No. 30 With Tire Applied

If your car is equipped with Continental or Standard Universal No. 3 Demountable rims, you can completely re-equip with No. 30 STANWELD Rims in less than one hour and with very little expense.

All that you need are the No. 30 rim bases. They fit perfectly the felloe band of either of the above mentioned types and can be applied without the necessity of any special wheel work or the addition of any bolts, wedges or special tools.

Merely remove your old tire rims from the wheels, apply your tires to the new rims, replace the rim with tire on the wheel, screw up your wedges and you have a complete set of new rims.

STANWELD Rim No. 30 is a vast improvement over all former similar types. It is operated without a special tool. Rust and freezing cannot interfere with its operation. Circumferential movement of either section is not necessary to detach a tire.



Merely open a small swinging latch with a screw driver, pry loose the ends of the two flat semi-circular spring rings which fit over corresponding lugs of both sections. The two sections of the rim base can then be separated for removal of the casing or tire. The locking rings can be replaced with the fingers in a very short time.

All the old difficulties experienced with the other types are completely eliminated. The rim itself is light, strong, extremely simple and easy to operate. The expense involved is so low that the oldest car can economically be re-equipped with the No. 30 STANWELD rim, provided its former equipment was either Continental or Standard Universal No. 3 rims.

Write to us, giving the present size of your rims and we shall furnish you with a descriptive folder giving prices. This is absolutely the best rim offer that has been made to the motoring public for many years.

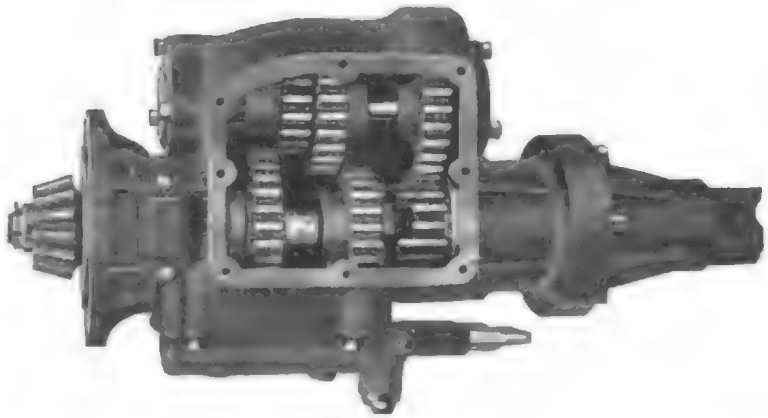
THE STANDARD WELDING COMPANY

CLEVELAND, OHIO

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COVERT

Covert Recognized Because Specialized



This year many more leading models show Covert Rear Axle Transmissions and Covert Jackshaft Transmissions, than ever before. There must be merit to warrant this growing popularity.

Fourteen years ago we exhibited the first Rear Axle Transmission. Our confidence in the advantages of this construction, at that time, has been justified by its converts, including many of the leading engineers in this country and abroad. These advantages apply with equal force to the manufacturer, and the man who operates the car.

We maintain a staff of able engineers, who will gladly go over your transmission problems with you.

We specialize on Transmissions designed for direct attachment to rear axle or jackshaft, and practically all the leading manufacturers of those parts carry a complete line especially designed to take Covert Transmissions.

Your 1914 plans are now before you. Let us show you the advantages of Covert Construction.

Covert Motor Vehicle Company

Sales Office: Ford Building, Detroit, Mich.

Factory: Lockport, N. Y.

COVERT

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WARM HAND WHEEL WARM HAND WHEEL WARM HAND WHEEL WARM HAND WHEEL WARM HAND WHEEL WARM HAND WHEEL

Be a Warm Hand Wheel Dealer

If you are a Warm Hand dealer this season you will be one next season, and every new car you sell or that appears in your territory will mean practically another Warm Hand Wheel sale for you.

The Warm Hand Wheel is as necessary to winter driving as is any other convenience on the car It is not a luxury but a real comfort-giving device useful seven months of the year, and in some sections, even longer.

The Warm Hand Wheel is electrically heated, operating from either storage battery or lighting system, or from the inbuilt fly wheel magneto on the Ford car.

It consumes a negligible amount of current—can be installed in a remarkably short time—and once on, need never be removed either summer or winter. The reason for this lies in the fact that the current may be turned on or off in an instant by a simple movement of the hand.



Circuit Open



Circuit Closed

No matter how cold the weather, how icy the wind, the Warm Hand Wheel will impart a grateful warmth to the hands, even in cases where gloves are not worn.

This is a simple story. We want you to consider and act upon it—for out of the retail price charged—$15—your commission is most liberal and one well worthy of your consideration.

Write and get your territory before it is invaded.

Warm Hand Steering Wheel Co.

527 Fifth Avenue New York

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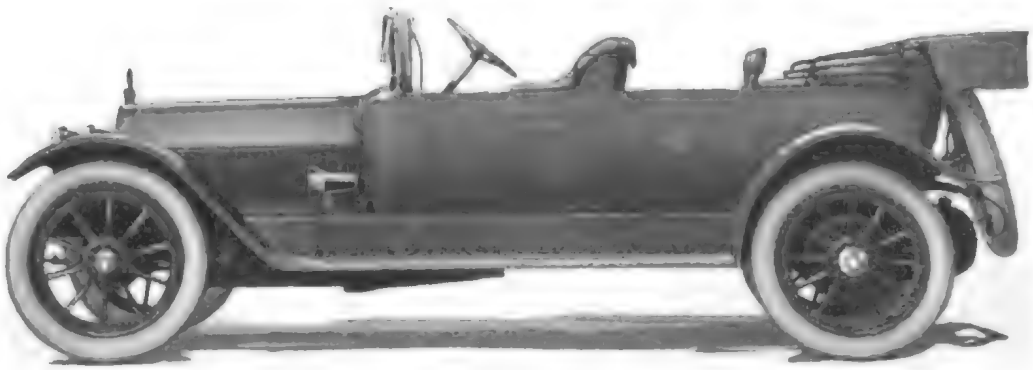
Stearns-Knight Success

Over twelve hundred Stearns-Knight cars are now running in daily service all over the world. Their owners form the greatest asset of this company.

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Three passenger roadsters, limousines and landaulets.



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(Knight Type Motor)

The F. B. Stearns Company

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Our Annual Catalog is the largest, most complete, up-to-date and authoritative dictionary of the auto supply market of any book published. It has come to be recognized as one of the standard reference works of the industry.

The total distribution of one hundred thousand copies of this catalog practically covers the world, at least wherever automobiles are used. Nearly all foreign as well as domestic automobile manufacturers and dealers, the offices of American Consuls, Public Libraries, Universities, Y. M. C. A. Schools, Publishers, Automobile Clubs, Engineers' Offices, Purchasing Departments—in all these places you will find a copy of the Miller catalog on file.

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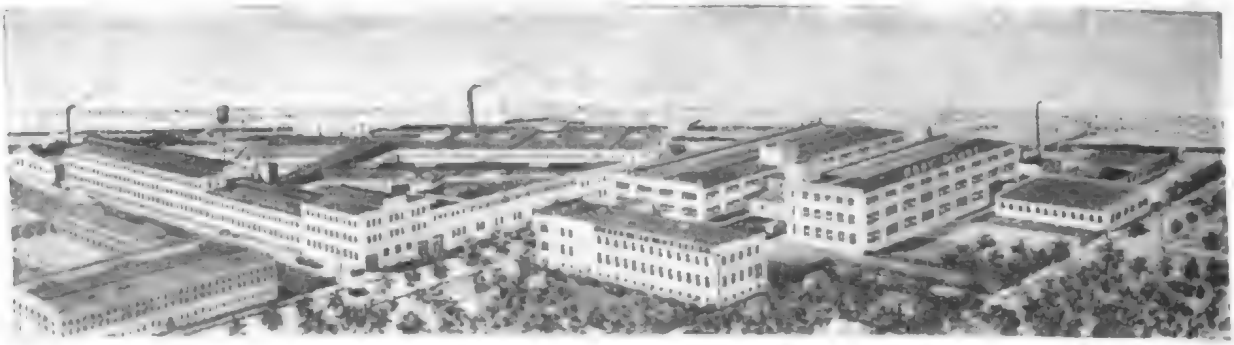
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FORESEEING the inevitable rise of the automobile industry and the tremendous field offered to the manufacturer of sheet metal parts for motor cars, Mr. J. H. Hayes organized the Hayes Manufacturing Company in Cleveland in 1903.

With 2,000 feet of factory space and a small force of men the first year's business totaled $17,000. Then the small plant was moved to Detroit, reorganized and headed by Mr. Hayes as president, with H. H. Sanger, vice-president, and H. P. Carrow, secretary and treasurer.

Each year the business doubled its sales, expanded its plant and added to its line of products. "Everything in sheet metal for the automobile" became the slogan, and motor car factories all over the country were using Hayes parts.

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Ask the Hayes organization about your sheet metal problems.

Hayes Manufacturing Company

Detroit, Michigan

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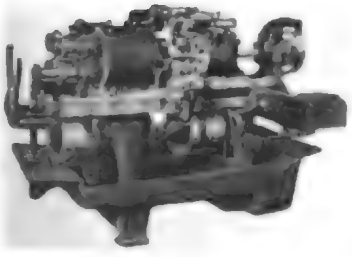
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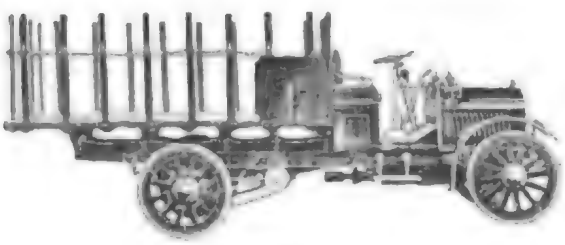
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Few cars are so perfect that they can be counted on to give uniform and unfailing service at the critical moment. But the car that carries

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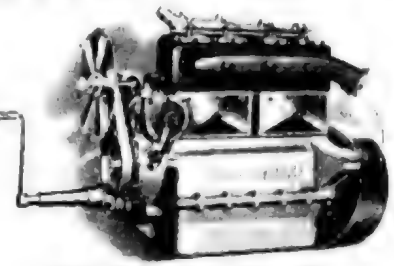
is always in commission. It goes when and where it is needed. It catches the train and delivers the goods. There are less chances of delay with a Rutenber-driven truck than with a horse-drawn wagon. There is no noise, no confusion, no uncertainty. No time is lost because of uneven streets or steep hills. And there are no big bills for upkeep and repairs

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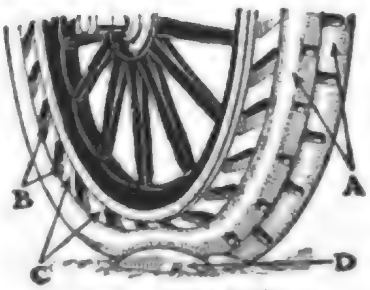
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Send today for Booklet 58 and Agent's prices.



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Stutz Six-cylinder, Six-passenger Touring Car, $2300

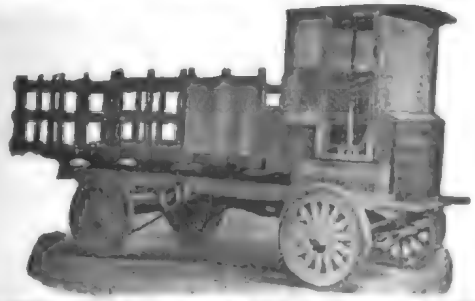
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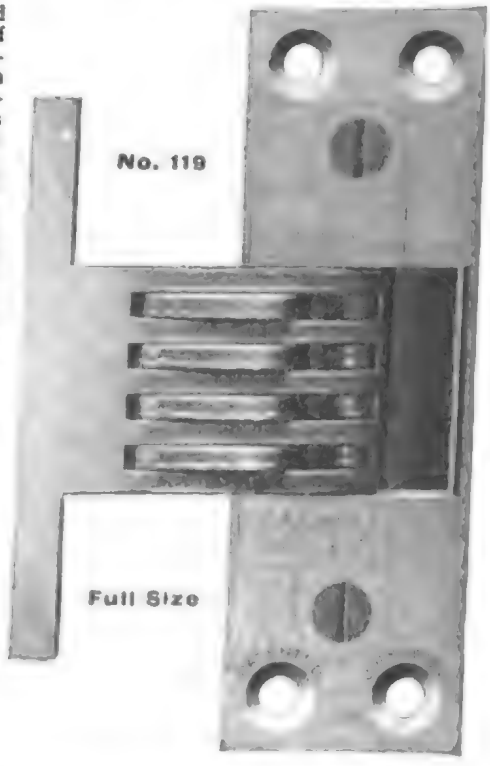
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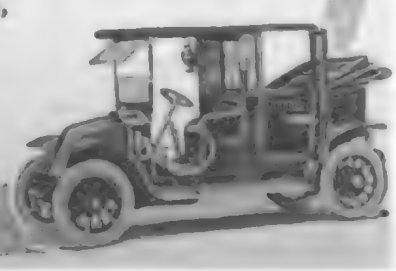
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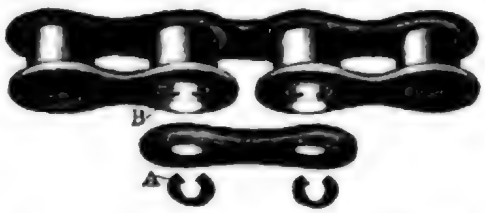
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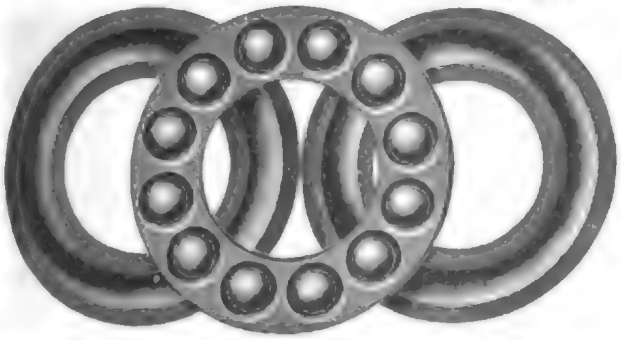
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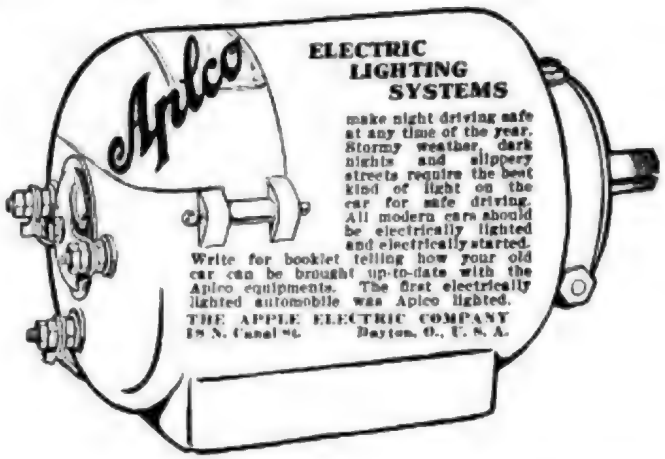
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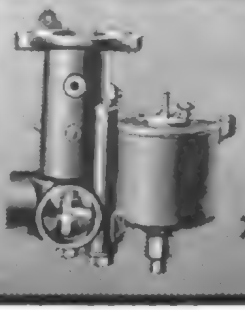


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Do you wish to make your car more comfortable by installing a pair of auxiliary seats? If so, have the best. Our seats are made in five styles. Send for catalogue.

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TWITCHELL AIR GAUGE



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The Motor Lamps with Distinctive Features

There are no other motor lamps on the market with the advantages of Solar Lamps. Solars are always exclusive in style and in quality. They are the strongest lamps as well as the most effective.

In no other lamps can you obtain the Solar Special Short Focus Lead Glass Lens Mirror Reflector—the patented system of double ray light projection which gives two distinct fields of light for town and country use—or the new and exclusive black finish with a metallic lustre which is unaffected by heat or moisture. All of these features are exclusively "Solar."

Do not equip your car or specify equipment to the maker until you have seen all of the Solar advantages. See Solars at any live dealer's or write for the catalog.

Solars are made in all styles for oil, electricity, gas and in combinations.

Solar Lamps

BADGER BRASS MANUFACTURING COMPANY
Kenosha, Wis. (137) New York City

NO SAFETY DEVICE

can equal



TRADE MARK **Raybestos** REG. U.S. PAT. OFF.

"THE ORIGINAL AND BEST ASBESTOS BRAKE LINING"

As a protection against accident to your automobile.

THE ROYAL EQUIPMENT COMPANY
436 Housatonic Ave. Bridgeport, Conn.

We also make Duplex and Raymond Brakes and Gyrex the Mixer.



Fabric Casing

TIRE CUTS ruin casings. They admit moisture to the carcass, cause the fabric to rot and weaken, grow larger—end in blowouts.

You can repair **CASINGS** and **INNER TUBES** anywhere in 15 minutes, better than a Repair Shop can do—and for *one cent.*

Universal Auto-Vulcanizer

Patented

A practical vulcanizing outfit complete, with enough repair gum to make 40 patches. It weighs 3 pounds and can be carried in the tool box. **Simplest and most satisfactory device for eliminating tire troubles that has ever been devised.**

Absolutely automatic. Place the patch—attach the Vulcanizer—put in the gasoline light it. No further attention required. In 15 minutes the job is done.



It *can't burn, scorch* or *injure* tube or casing. It *can't* get out of order. It *can't* fail to do its work. So simple, anyone can operate it. The Universal Auto-Vulcanizer saves its cost a *hundred times* over in trouble and expense.

Price Complete **$4.00** Ready for Instant Use
Guaranteed Satisfactory or Money Refunded

ADAMSON MFG. COMPANY, East Palestine, Ohio

Repair That Inner Tube Yourself

No electricity, no steam, no trouble, no delay. A little gasoline, a little rubber, the

Imperial Vulcanizer Repair Kit

and a few simple directions, and you have repaired the puncture perfectly in 15 minutes. Time and money saved.



GUARANTEED TO SATISFY OR MONEY REFUNDED

PRICE, $3.50
NICKEL PLATED
Patent Pending

Complete with enough rubber for 40 punctures. Pays for itself in a short time.

At Your Dealer's or By Express

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RAJAH GIANT PLUG

Extra strong and heavy. Perfectly simple—only four parts, which are easily taken apart for repairs or replacement. Only highest grade, imported, hard fire porcelains used. Minutely accurate, well finished machine work. No thumb screws—a Rajah Clip Terminal supplied with every Plug. Price, $1.50 postpaid—the most economical Plug made. Send for catalog.

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SPRING BOLT ESSENTIALS

The things which are necessary in every spring bolt will be explained in the February 13th issue of Motor World. Watch for our advertisement in that issue.

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SPLITDORF

"Always There"

SPLITDORFLITE electric lighting generators are a positive source of illumination and especially adaptable to installing on machines not designed for a lighting outfit. SPLITDORF claims are guaranteed.

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Complete Differentials

The New Process Gear Corporation
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The Kentucky Thoroughbred
"AMES 45"

Long stroke, powerful Continental Motor—Electric (Dynamo) Lights—Self Starter—Left Hand Drive—Full Equipment—"Amesbuilt" Bodies and Tops. A combination of power, speed, endurance and graceful lines. Price, fully equipped, $1,635. This is 1913's most remarkable car value. Backed by a reputation of 30 years it will win you from the first inspection. We have a most liberal proposition for good, live agents. Send for catalog.

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Any Kind Every Kind Stock, or to Blue Print **Rims** Clincher Q. D. Demountable Channels

For Automobiles, Motor Trucks, Aeroplanes, Motorcycles, Bicycles.

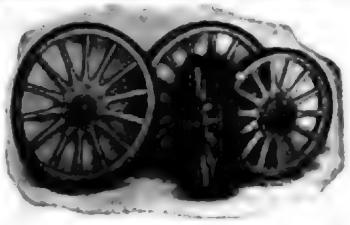
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R. B. ABBOTT SALES CO., Sales Agents, Detroit

Motor Car Manufacturers Since
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Occupying the newest and most modern automobile manufacturing plant in America.

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Ready for 1913

"STANDARD" WHEELS

FOR PLEASURE OR COMMERCIAL CARS
One Passenger to 16 Tons Capacity

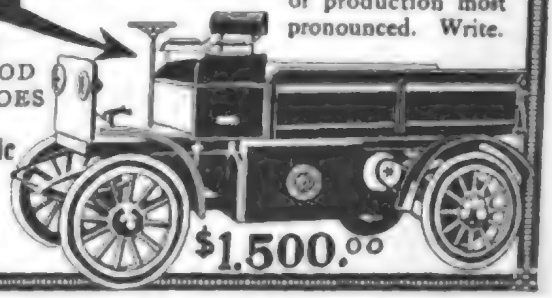
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DEALERS—Here is the first electric truck that sells for about $700 less than any other. Capacity 1000 pounds—Service 100 per cent. more than gasoline truck—Economy of production most pronounced. Write.

MADE TO MAKE GOOD AND IT DOES



M & P Electric Vehicle Co.
Franklin and Detroit Sts.
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$1,500.00

Drop Hammer Forgings

cost very little more than castings. They are vastly superior and less expensive in the end.

WE ARE SPECIALISTS
in producing
DROP HAMMER FORGINGS
from special analysis steel.

Send prints of parts you will need in
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QUALITY AND SERVICE GUARANTEED
THE CONSOLIDATED MANUFACTURING COMPANY, Toledo, Ohio

Hook up with COLE

COLE

Series Eight comes in Three Chassis:

Cole Sixty six cylinder Touring Car, five passenger convertible to seven passenger, 132-inch wheel base, Delco electric lighting, starting and ignition. $2485

Cole Fifty four cylinder Touring Car, five passenger convertible to seven, 122-inch wheel base, Delco system. $1985

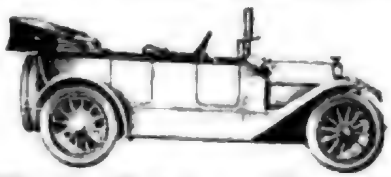
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WRITE TODAY for Cole Blue Book and dealer's proposition.

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Type 35
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Electric
Lighting and
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MERCER *The Champion Light Car*

Mercer power and efficiency are well-known qualities. These features are decidedly emphasized in our new series. The various models offer a Mercer for every reasonable need.
PRICES: $2600 to $2900.
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Built to last



THE SILENT CAR

BUILT TO LAST

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A beautiful and classic equipage that stands unchallenged in point of constructional achievement.

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The Six "48" Keeton Compares with the best foreign cars

THREE EXCELLENT MODELS

Riverside Touring Car, Five Passenger, Completely Equipped	$2750
Two extra folding seats for above	$25
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Chassis without tires or rear guards	$2250

All prices f. o. b. *Booklet on request*

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Three New Models—All Fully Equipped

4-36	4-44	6-66
$1,875	$2,150	$2,750

We are building 500 extra PULLMANS for 1913—1500 in all. Our present dealers have spoken for 1000 and the increase is for new territory—possibly yours is open. Our SALES MAKING ORGANIZATION helps the agent—let us tell you how.

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Touring Car and Roadster Types. 44 h. p. 6 Cylinders. Unit Power Plant, 3-Point Suspension. 122 in. Wheel-Base. 36 x 4 Tires.

HAVERS SIX

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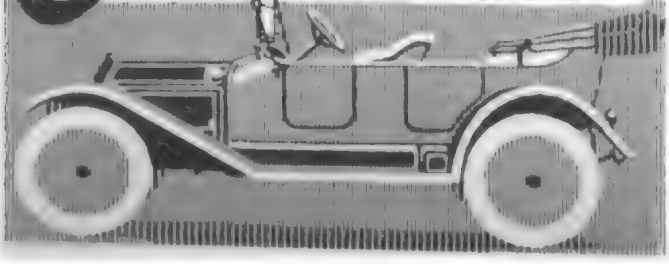
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Write for full specifications

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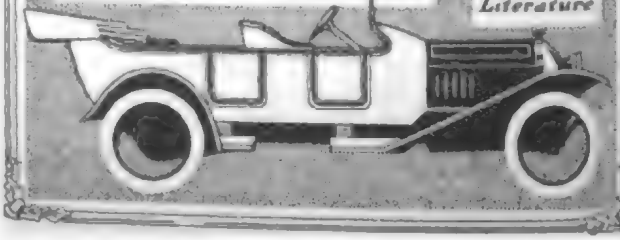
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Two Models Only
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The same chassis is used for both models.
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Four & Six Cylinders $1000. to $3000. *Write for Literature*

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PONTIAC MICHIGAN



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Price Complete $24

Lights, dims and extinguishes all gas lamps on the car through a simple turn of the hand. Coupled to valve-stem of acetylene tank. Direct control. Always within easy reach



Convenient
Safe
Dependable

Write for booklet and dealer discounts.

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Sole Licensed Manufacturers for the United States.

Another Victory for Staver

Staver 55 was the only touring car to finish the exacting "Round Lake Michigan" reliability run with a perfect score—repeating its victory in the contest of the preceding year.

Larger Output—Three Splendid Models

For 1913, we are concentrating on three great models—Staver 55, Staver 45 (our competition crushing forty), and our big Staver Six.

Staver cars are roomy, luxuriously upholstered, up to the minute in equipment. Backed by Staver durability, they are the biggest value on the market.

STAVER CARRIAGE CO., 76th and Wallace Sts., Chicago



RELIANCE
"The Speedometer of Quality"

Special features that eliminate speedometer troubles. Send for the booklet.

Reliance Speedometer Co.
134 Eliot St. Boston, Mass.

Glare Eliminator

Tones down headlights for city driving and foggy nights—an auto necessity. Price 75c. per pair. Sells like hot cakes. Dealers, secure the agency quick.

F. H. TOBIAS
1931 Broadway, New York

POLSON Quality Windshields

Auxiliary Seats, Bumpers and Gas Starters

POLSON MANUFACTURING CO., Buffalo, N. Y.

SIMMS MAGNETO "American Made"

NOW READY FOR THE TRADE

Highest Efficiency—Good Service Guaranteed

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We have a plan to help you sell more cars. Our business is financing the sales of automobiles to people you would trust if you could do a credit business. We make good your credit and pay your car sales commissions at once. Get the details.

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NATIONAL Compound Mixer and Primer

makes any car start easier in cold weather; adds 10 to 40% to power and mileage. Simple, easily installed, guaranteed effective on any motor. Get details and price.

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Here is an accessory that will not stay on the shelf. It sells on sight.

MARVEL STEAM VULCANIZER

Automatic, therefore safe for rubber. Uses alcohol or gasoline. Low priced. Send for sales plan and sample Vulcanizer.

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The Ford Water Circulator

forces the water from radiator through cylinder water jacket, maintaining rapid circulation when car is in motion. Write for descriptive matter if you handle Ford cars.

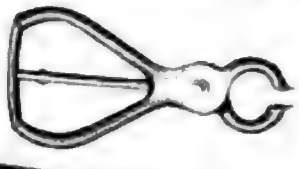
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"THE MASTER CAR" SIXTEENTH YEAR

6 Cyl. 50 H. P., $5,000 4 Cyl. 35 H. P., $4,500
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(Completely Equipped)

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GILMER TIRE REPAIR PLIERS

The biggest live wire selling proposition that ever went across the dealer's counter. Get the details and you will surely order.

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GILMER TIRE REPAIR PLIERS

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Weed Chains

The Great Anti-Skid DEVICE

Nine-tenths of all accidents to automobiles are caused by skidding or slipping.

Either you skid into the "other fellow" or the "other fellow" skids into you.

No matter how careful a driver you may be, you **cannot prevent skidding** or slipping on wet, muddy snow-covered roads or on icy, slippery greasy pavements unless you equip your car with **Weed Chains.**

Cannot Injure Tires

Because They Creep

An absolute necessity on both rear wheels and if you want to know what real steering steadiness means put them **on the front wheels too.**

For your own safety—for the safety of the public, **fully equip** your car with **Weed Chains.** Make it **your business** to get a set today.

Recommended and sold by all reputable dealers

Weed Chain Tire Grip Co.
28 Moore St. New York

The Name "Weed" on Every Hook



Abbott-Detroit

"The demand of the day is that an organization shall be judged by its product and not by what it claims for itself" Keep this in mind when you examine these 1913 models

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30-40	Fore-door Roadster, 116-inch wheel base	$1700
34-40	5-passenger, Fore-Door Touring Car 116-inch wheel base	$1700
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Write for "Guide Books" Nos. 1 and 6

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ARE THE BEST

A. R. MOSLER & CO.
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AJAX EXTRA HEAVY NON-SKID TIRES

The Only Non-Skid Tires *Guaranteed for 5000 Miles*

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General Offices: 1796 B'way, New York
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The Otho System

for Self Starting Lighting Ignition Signalling

"Is right Inside the Flywheel"

Otho Motor Co., 60 State St. Boston, Mass.

METZ "SPECIAL" $395

Completely equipped, fully guaranteed. 22½ H.P., 4-cylinder water-cooled motor, Bosch magneto. Artillery wheels, best quality 30" x 3" clincher tires. Makes 5 to 50 miles per hour on the high speed, 28 to 32 miles on 1 gal. of gasoline. You can secure EXCLUSIVE SALE in your territory. Send for Book "B."

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REGISTERED U.S. PAT. OFFICE

Magneto Plugs coax maximum power out of engine.
EMIL GROSSMAN COMPANY, Mfr., New York and Detroit

GASOLINE TURBINES

Half the size, Half the weight, Half the fuel, Half the friction

Smooth as Electric, Will replace any engine in any car

No Valves, No Springs
No Adjustment, No Noise
No Fly Wheel, No Muffler
No Back Pressure

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Exclusive Territory Open for Live Agencies

CHAMPION SPARK PLUGS

Special Designs for Every Type of Motor Made

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Perfection Spring Company

SPECIALISTS IN

Spring Suspension

High Grade Only

Cleveland, Ohio

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Sheet Metal Stampings

Estimates Cheerfully Furnished

The Bossert Company
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American Kushion Kore

A tire filler 10 to 20 per cent. lighter than any other tire filler. A big proposition for dealers who are on the alert for more and better business. Write for details.

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Drop Forgings

Ready for Immediate Delivery

by the manufacturers who have made a specialty of drop-forgings for more than forty years.

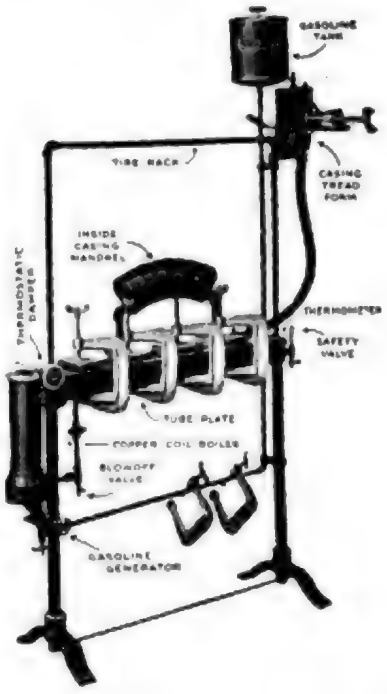
Because of this experience we know just what is the correct kind and temper of steel to use in the various forgings.

Why Experiment ?

Estimates gladly submitted for special forgings. Send us the blue-prints.

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Complete Vulcanizing Plant $45

A great money maker for the garage or repair shop. Handles every practicable kind of tire repairing, from a tube puncture to largest casing blow-out.

No experience necessary for its successful operation as the steam pressure is automatically controlled and held at the vulcanizing point. Steam generated in a copper coil boiler that heats the machine as quickly as you can get a tire ready.

Place your order at once and insure delivery of your vulcanizer when you want it. Be prepared to handle the most profitable part of the repair business.

SHALER

Vulcanizers for Every Requirement of Motorist or Repairman

The Shaler line of vulcanizers, the only complete line in the world, includes models to suit everyone from the motorist with one small runabout, to the garage handling large quantities of work. A full line of electric, steam and gasoline heated vulcanizers. Write for catalog today.

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15 cents per line of six words, cash with order.
— In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

FOR SALE—Several used racing cars, by a factory famous for its success in contest work. These cars have been rebuilt and are in perfect running order and had perfect care and attention during their use in contests. Here is an opportunity to secure something exceptionally fast at a low figure. They will be snapped up quickly. Address Box 414, Indianapolis, Ind.

FOR SALE.

COMPLETE WORKING DRAWINGS AND PARTS

FOR THE MANUFACTURE OF

GASOLINE LIGHT DELIVERY TRUCKS.

With the purchase of a business, we acquired among other things complete working drawings and stock of parts for medium priced gasoline motor delivery wagon, designed by Gustave Chedru. Several prominent Buffalo merchants are using these delivery wagons, and they are giving very satisfactory service.

We will dispose of the whole of these drawings and stock of parts at a bargain. Here is a chance to secure a successful design, complete working drawings and stock of parts at very much below their market value, and at about 10 per cent. of what it would cost any manufacturer starting in the delivery truck business for a design, experimental and development work. BUFFALO ELECTRIC VEHICLE CO., BUFFALO, N. Y.

HELP WANTED—Salesmen now calling on accessory trade can easily double their present income carrying as a side line our quick selling, well advertised product. Pocket sample. Very liberal commission. One good order per day makes you $100.00 per week. No long sales argument needed. Address G. T. J., 706 Dollar Bank Bldg., Youngstown, Ohio.

TOPS AND SEAT COVERS.

High-grade material and experienced workmanship in either case. Our Tops are built to look right tomorrow and a year from tomorrow. Our Seat Covers can be cleaned to look like new, with gasoline or soap and water. We're glad to estimate special work or quote prices on stock goods. Prompt service assured. CENTRAL AUTO TOP CO., 120 W. Mich. St., Indianapolis, Ind.

WANTED—An expert automobile mechanic to take interest in large commercial garage and to take charge of the shops to be operated in connection with it. Address LOS ANGELES AUTO & TAXICAB LIVERY, 622 So. Broadway, Los Angeles, California.

WANTED—Either Toy Tonneau or two passenger Roadster Model "D" 1909 Oldsmobile. State fully condition, equipment and least cash price. AUTOMOBILE, 250 East Main St., Lexington, Kentucky.

FURS—SOMETHING NEW, BEAUTIFUL AND ELEGANT CARRIAGE COVERS; TRAVELER WISHES TO REALIZE. CALL FROM 9 TO 2. ALVAREZ, 138 WEST 46TH ST., NEW YORK CITY.

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A GENTEEL ad energetic young business man of good address, starting West March 1, making all the largest cities west of Chicago to the coast, would like to represent some concern as a side issue; present position occupies but two hours daily a week in each city; all railroad fares paid; abundant time to devote to any good, live proposition; auto or accessory preferred. Box 243, Motor World.

OFFICE MANAGER, good executive ability, competent to handle correspondence, accounts, handling salesmen, etc.; wants to relocate. Now with motor truck company. Box No. 244, Motor World.

A $5000 Locomobile in good condition; five good tires. The first check for $1500 gets it. J. B. McALESTER, McAlester, Okla.

KEROSENE FOR AUTOMOBILES.

New Model B uses successfully half and half mixture lowest grades kerosene and gasolene. Satisfaction guaranteed or money refunded. Greatly increased power, very slow speed on high. Starts easy at zero. Special agents' prices. Dept. 8. THE AIR-FRICTION CARBURETOR CO., Dayton, Ohio.

AUTO LISTS, owners, etc., of any State. S. H. CARROLL, JR., Albany, N. Y.

FOR SALE—Garage, equipment and business at Hobart, Okla., county seat of 5,000, two railroads, prosperous and growing agricultural section surrounding. Weather and roads such that everybody uses the auto the year round. No tie up for snow and ice. Come or write. D. A. SCOTT, Hobart, Okla.

FORD Model T Reference Book" gives cause and cure of all the ails of Model T simply and concise. Gives the latest kinks. Full of pointers. Written especially for it. Elaborate cross index enables you to discover any trouble at once. Write for descriptive circular or sent postpaid, $1.00. FORD REFERENCE BOOK CO., 57 West 125th St., New York.

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FOR SALE—Cheap, one American Traveler, color battleship gray; just like new; run a little over 4,305 miles. MICHIGAN AUTO CO., 410 7th St., Calumet, Mich.

FOR SALE OR LEASE—The most modern garage in Southern Colorado, with fine repair shop and storage room for sixteen cars, doing good business and fine prospects for coming year. A snap for someone. Address BOX 208, Monte Vista, Colo.

SITUATION WANTED, with accessory manufacture or supply house, by young, energetic man, thoroughly experienced in the wholesale, retail and mail order supply and tire business. Good salesman and buyer and thoroughly competent as correspondent, advertising and catalog man. Would like to connect with a good, reliable concern. Address BOX 999, care Motor World.

FOR SALE—One Ford town car body. Fits any Model T Ford chassis. BENNINGTON GARAGE, Bennington, Vt.



An ad. like this will cost you $1.05 for each insertion.

These columns offer you an opportunity to appeal to an audience of 8,000 readers whose merchandising taste is being cultivated

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15 cents per line of six words, cash with order. — In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

WANTED—A high class draughtsman, having had motorcycle experience, in making application state previous experience and salary expected. THE POPE MFG. CO., Westfield, Mass.

PEERLESS AUTO TOP DRESSING.
A waterproof dressing for leaking mohair and duck tops and curtains. Makes old and faded tops look like new. Ask your garage and supply dealer for it.
The Columbus Varnish Co., Columbus, O.

AUTOMOBILE FOR SALE—1912 Marmon Speedster, Indianapolis Speedway type car. A-1 condition; run 4,000 miles. For particulars apply W. F. BURROUGHS, 66 Midland Ave., Arlington, N. J. Tel. 29 Arlington.

WANTED TO BUY—Five or seven passenger automobile for cash, in good condition; no dealers. 172 Pacific St., Brooklyn, N. Y.

BARGAIN—Two new and never used 34 x 4 Davis Armor, Model B, Tire Protectors; cost $54.00. Will take $32.00. Disposed of car before "Armors" arrived. BOX 231, care Motor World.

LOT in Velasco, Texas, for automobile or motor boat; paid $1,000 20 years ago. TOM CHILDRESS, R. F. D. No. 2, Arlington, Texas.

APPLY Boyer's Automatic Refinisher to your automobile today. Tomorrow it will look as though it just came from the factory. Finest thing in the world for dull hoods. Easily applied with cheesecloth. Particulars free. BOYER CHEMICAL LABORATORY CO., State and Michigan Sts., Chicago, Ill.

PEERLESS EXTRA FINE BLACK JAPAN.
Covers solid one coat for enameling lamps, radiators and fenders. No undercoat required. Heat does not affect it. Ask your garage and supply dealer.
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MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXXIV
No. 8

New York, February 13, 1913

Ten cents a copy
Two dollars a year

Electric DISCO Starter

Astounds New York Show Visitors

Interest at the New York Show was largely centered around **Electric Starters** and, naturally, motorists expected to see some good demonstrations, but imagine the exclamations of surprise and astonishment created by the following exhibition:

Every ten seconds, night and day, the Electric Disco by pressing a button was made to S-P-I-N a great big 60 H.P. Six Cylinder Engine, under 65 pounds compression, ONE HUNDRED AND TWENTY Revolutions Per Minute!

Think how **fast** that is!

Think how **large** a 60 H.P. Continental Engine is!

Think what **65 pounds** compression means!

It just means that here is an Electric Starter that takes the **biggest engine** under **full compression**, and makes it fairly **hum**. Doesn't merely **turn** over the engine or **crank** it but SPINS it—almost like a toy top.

What more could men ask of a Starter?

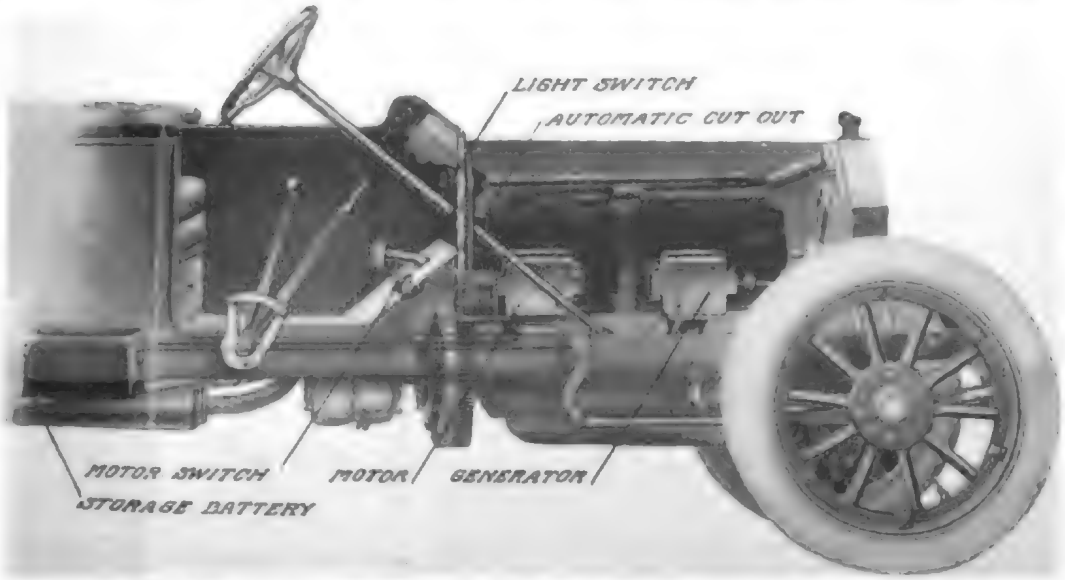
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Don't make the mistake of buying a car with "any old" electric starter. **Investigate.** Write for literature on all the Electric Starters you know. Learn all the facts. **See for yourself. Then** judge.

And remember **this**, the **best** Electric Starter, even though it may cost more than others, **is none too good for YOUR CAR.**

Don't you want our new Book, our Story on Starters, just off the press? It's a handsome little 5 x 7 Brochure that portrays in type and picture the latest developments in **Electric Starting** and **Lighting.** You may have a copy sent to your home or office. Just drop us a line and we'll forward it by return mail.

THE IGNITION STARTER CO., 715 Dodge Bldg., Detroit, U.S.A.



The Electric Disco

Starting and Lighting System

Published Weekly by the Motor World Publishing Company, 1600 Broadway, New Y

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Flexible springs and deep upholstery do not give you the maximum motoring comfort. It is these things in combination with the

Truffault-Hartford
SHOCK ABSORBER

that realize easy riding on all roads, rough or smooth. TRUFFAULT-HARTFORDS assimilate all jolts and jars—and by eliminating vibration, reduce the danger of crystallization of axles and steering knuckles. Their value as tire savers makes them an economy. In a season they will save many times their cost in increased tire mileage obtained. Most efficient and least conspicuous of all shock absorbers. The choice of discriminating motorists and of 23 leading car manufacturers for regular equipment. Five models, the New Automatic $60, Standard $50, Intermediate $40, Junior $25, Juniorette $15 per set of four. See your dealer and write for our catalog.

Hartford Suspension Co., EDW. V. HARTFORD, Pres.
Office and Factories: Jersey City, N. J.

Manufacturers of Hartford Self-Starters, Shock Absorbers, Jacks and Bumpers



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R·I·V Ball Bearings



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The prominent manufacturers are equipping their 1913 cars with R. I. V.

The Atwater Kent Ignition System



Time was when automobile engineers and the general motoring public thought they must equip their cars with a magneto. Today this idea is fast waning—in fact, it has been discarded by many of the foremost automobile engineers and discriminating motorists who are now demanding a more dependable source of current on their cars.

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Such is the Atwater Kent Ignition System—embodying the best features of both magneto and battery, without the weaknesses of either.

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In addition to our standard Type F System, we are marketing a new model —Silent Type K with automatic spark control and insulated primary circuit.



Whether you are interested in motor cars as manufacturer, dealer, owner, or prospective buyer, you should have a copy of our booklet "D." It covers the subject authoritatively and thoroughly and even the most experienced will find it interesting reading.

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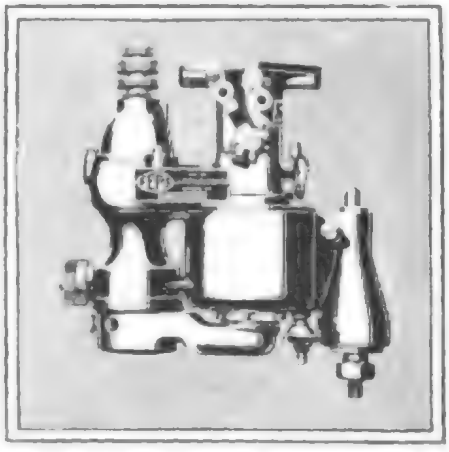
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MOTOR WORLD

Vol. XXXIV New York, U. S. A., Thursday, February 13, 1913 No. 8

N.A.A.M. TAKES COGNIZANCE OF GASOLENE SITUATION

Appoints Committee Which Seeks to Discover "What's What"—Engineers' Society Also to Discuss Kerosene Carburetters.

Although no announcement of the fact was made, it transpires that the National Association of Automobile Manufacturers has interested itself in what has come to be known as the "gasolene situation." Its interest has taken the form of the appointment of a committee of three to probe the subject, the committee consisting of Alfred Reeves, chairman, A. L. Pope, of the Pope Mfg. Co., and R. D. Chapin, of the Hudson Motor Car Co. The committee is clothed with general authority to go as far as possible in its investigations, the result of which, of course, will be reported to the association.

It is known that the committee has interviewed at least two of the influential directors of the Standard Oil Co., and before it completes its labors it expects to confer with others and also with representatives of the several independent companies, and, in fact, to seek information wherever it is likely to be found.

The chief idea of the N. A. A. M. inquiry is not so much to discover the causes that have led to the 90 per cent. advance in the price of the fuel within about a twelvemonth, but to find out what is the prospective supply for not merely the forthcoming year but for a period of at least five years and, of equal importance, what is likely to be the quality or specific gravity of the fuel; also what suggestions or recommendations the oil producers themselves have to make which point to at least a measure of relief.

When the information is obtained, and if it is learned that the supply of gasolene is likely to diminish and increase in price, and that kerosene or some other fuel is necessary to save the situation, it is the intention of the N. A. A. M. to call the engineers of various automobile companies in conference and have them redesign their motors or carburetters, or both, to meet the new conditions.

Less directly, the Society of Automobile Engineers also is interested in the subject of gasolene. At the next meeting of the Metropolitan Section of the society, which is scheduled for Feb. 27th, and will be held in the society's rooms at 1784 Broadway, New York City, a paper on kerosene carburetters for motor car use will be presented, and invitation has been extended to all carburetter manufacturers to be present and take part in the discussion, which is expected to prove unusually fruitful.

Goodyear Buys Control of Fabric Mill.

Interests representing the Goodyear Tire & Rubber Co., of Akron, Ohio, have purchased the controlling interest in the Killingly Mfg. Co. of Williamsville, Conn., which manufactures tire fabrics among other cotton goods. Following the acquirement, new offices for the Killingly company were elected, as follows: President, Benjamin F. Smith, of the B. F. Smith Construction Co. of Pawtucket, R. I.; treasurer, W. E. Palmer of Akron, Ohio; vice-president and assistant treasurer, W. Irving Bullard of Danielson. These gentlemen and W. T. Teegan of Boston and A. M. Bannister of Providence make up the new board of directors.

Million Dollar Tire Company on Coast.

W. D. Newerf, who for many years was prominently engaged in the tire jobbing business on the Pacific Coast and who latterly has been occupied in organizing a company actually to manufacture tires in that territory, has matured his plans to the point of incorporating the Panama Rubber Co., capitalized at $1,000,000. It is stated that he has interested a number of Los Angeles and San Francisco men in the enterprise and that a factory site near San Francisco is being considered.

CONSOLIDATED SEEKS TO SEIZE GOODRICH STOCK

Near-Expiration of Grant Solid Tire Patent Creates Remarkable Situation—Goodrich Accused of Holding Back Tires.

Although the famous and much-litigated Grant imbedded-wire, solid-tire patent, No. 554,075, owned by the Consolidated Rubber Tire Co., expires next Tuesday, 18th inst., a flood of tires of that construction upon the market will not immediately follow if the United States District Court for the Southern District of New York grants a motion which has been made by the Consolidated company and which is due for argument on Friday of next week, 21st inst.; the motion, among other things, will ask that some 300,000 pounds of tires, alleged to be held in stock by the new B. F. Goodrich Co. at its factories, be seized and held for an accounting on the grounds that the tires were manufactured prior to the expiration of the patent, which has been held valid by the courts. These tires are said to be worth about $120,000, and if the makers contemplated placing them upon the market as soon as the patent dies the granting of the motion will cause them some inconvenience.

This motion is a part of the Consolidated's suit against the Diamond Rubber Co. of New York which was filed in 1907 and is a part of litigation that has filled the volumes in the United States District, Circuit and Supreme courts for nearly fifteen years. The immediate status of affairs may be briefly explained by the statement that the Consolidated's suit against the New York Diamond company resulted in a victory for the former in every court and the action now has been in the accounting stage for about a year, which is to say that the machinery of the courts is being used to determine how much the Diamond owes the Consolidated because of manufacture and

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sale of infringing tires prior to the injunction which stopped sales.

Since the Goodrich company bought the Diamond company, and with it the New York Diamond company, the motion will also ask that the new and larger Goodrich company, B. G. Work, its president; Arthur H. Marks, president of the old Diamond company; William B. Miller, former Diamond secretary, and Andrew H. Noah, vice-president of the old Diamond company, be made parties in the defense. The motion was to have been made last Friday, 7th inst., but was adjourned for a period of two weeks.

The Consolidated, which is now known as the Kelly-Springfield Tire Co., won its infringement suits all along the line, and of the defendants the Hartford, Morgan & Wright and Firestone companies have made settlement. In the accounting stage are judgments against the Pennsylvania Rubber Co., the Thermoid Rubber Co. and the Rutherford Rubber Co.

An additional new feature in the litigation consists of two decisions in favor of the Consolidated interests rendered in the United States Circuit Court of Appeals in Chicago last Friday, 7th inst. Despite the many previous decisions in favor of the Grant patent, Judge Kohlsaat, of the District Court, had thrown both cases out of court as devoid of equity and the Appellate Court as promptly overthrew these decisions from the bench, ordering a mandate down to the lower court immediately, whereas the usual order is to permit thirty days to elapse, granted an injunction and ordered an accounting for the Consolidated. The defendants in these two actions were the B. F. Goodrich Co., of Akron, Ohio, and the Republic Rubber Co. of Youngstown, Ohio.

Engine Starters Cause of $3,100 Suit.

When the Pullman Motor Car Co., of York, Pa., files its answer to the suit which was instituted this week in the Supreme Court for New York County by the American Ever Ready Co., it may tell why it refused to pay for Ever Ready starters to the value of $3,103.24, but this far only the Ever Ready side of the argument is public property. The complaint states that the Pullman company contracted for engine starters and was to pay $50 each for No. 2's and $55 for No. 3's, and that between April 25 and December 19, 1912, goods to the amount of the judgment asked were purchased. The contract specified that the starters were to be regular equipment on all Pullman models except the 4-30, 4-35 and 4-50, these latter being excepted because, it states, they are to be discontinued as soon as the material on hand for their manufacture is exhausted.

1912 IS 48% BETTER THAN 1911 IN EXPORTS OF CARS

Automobiles Valued at Close to $24,000,000 Shipped in Twelvemonth Just Ended—Gains Recorded in Other Years.

Keeping pace with the records of preceding years, 1912 in the matter of automobile exports marked a substantial gain over 1911, the shipments for the calendar year just closed totaling $23,703,989, which is $7,779,628, or 48 per cent., in advance of the 1911 figure. The statistics do not include tires, parts or engines and the values of cars shipped to the non-contiguous American possessions, Hawaii, Porto Rico, the Philippines and Alaska are omitted, those compilations not yet having been completed. In 1911 the car exports were supplemented by the addition of $3,254,123 for parts, not including tires.

The gain of December, 1912, over the same month of the preceding year was slight, being but $127,382, or .66 per cent. The comparative values were, respectively, $2,060,812 and $1,933,430.

While the gain of 1912 over 1911 exceeds that of 1911 over 1910, neither is as great as the advance made by 1910 over 1909. The 1910 exports of cars totaled $11,210,295, which 1911 surpassed by $4,713,066, a gain of 42 per cent. The advance of exports in 1910 over the twelvemonth which went before was 62 per cent. The 1910 figures, as stated, were $11,210,295, which, in comparison with $6,889,031, the 1909 valuation, is a monetary increase of $4,321,264. The parts exported prior to 1911 were: 1910, $1,980,001; 1909, $897,586.

Prest-O-Lite Presses Refilling Suits.

When the Municipal Court of New York City held last week that the Prest-O-Lite Co. could not legally sue the 35% Automobile Supply Co., of New York City, for a penalty of $100 for refilling trademarked Prest-O-Lite tanks because of a defect in the filing of the trademark in New York State, that case was abandoned by the complainant, but the trademark was immediately refiled so that it accorded with the law as amended in 1907 and other suits are to be pressed. The decision in the "35%" case was more or less technical. Those who are still to be prosecuted are Smith-Haines, Inc., the Automobile Supply Co. and the Economical Tire & Supply Co., all of New York City. The cases probably will be heard February 21.

While the Searchlight Gas Co., just prior to going into the hands of a receiver, succeeded in overturning the patent under which the Prest-O-Lite Co. operated, litigation between the two is not ended, for there yet remains an action against the Searchlight in the United States District Court in Indianapolis in which the Searchlight is charged with unfair competition in refilling Prest-O-Lite tanks. This is under a Federal trademark law.

Mason Sues its General Manager.

H. W. Hayden, vice-president and general manager of the Mason Motor Co. of Waterloo, Ia., has been made the defendant in an action instituted by the company, which charges conversion and misappropriation of funds to the amount of $18,000. The complaint asks judgment for that sum and prays that a lien be placed upon certain stock of the company held by Hayden.

According to the papers in the case, Hayden became a Mason stockholder in September, 1911, when he acquired 1,888 5/6 shares, each of $100 par value. In January of the following year he was made a director of the company and assumed the vice-presidency and general management. Between September, 1911, and January 25, 1913, according to the complaint, Hayden had charge of the financial affairs of the company, making collections, receiving moneys, drawing checks, etc., and it was during this period that it is alleged he converted to his own use, or otherwise misappropriated, funds to the amount of $18,000.

Miller Sells Out to His Partners.

A. R. Miller has disposed of his interest in the firm Barthel, Daly & Miller, of New York, to his partners, the firm name becoming Barthel & Daly. They will continue to act as sole American importers of Schafer ball bearings. Miller, however, will not wholly discontinue his association with his former partners, as he will continue to represent the firm in the West. For some time he has been stationed in Detroit, which will remain his headquarters.

Packard Markets Remaining Note Issue.

Wm. A. Read & Co., the New York bankers, have purchased from the Packard Motor Car Co. the $1,000,000 five per cent. debenture five-year notes which constitute the unsold balance of the $3,000,000 issue which was authorized in December, 1911. The bankers at once resold the entire block. The notes are redeemable at 101 on any interest day.

Batcheller Would Become "Akron."

The Batcheller Rubber Mfg. Co., of New York City, has applied to the supreme court for permission to change its name to the Akron Tire Co., Inc. In the proceedings, Margaret M. Burnet, of 2 Rector street, figures as the Batcheller attorney.

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FORD ASKS COURT TO HOLD UP EXPORTER'S SHIPMENT

Declares Bowring Company Would Invade Territory of Ford's New Zealand Dealer—Cars Were Intended for Chili.

New Zealand, Chili, thirteen Ford Model Ts and the steamship "Minnehaha" figure in an action which was instituted this week in the Supreme Court for New York county by the Ford Motor Co. against Bowring & Co., New York exporters, and the Atlantic Transport Co., which owns the ship in question. The Ford company asks that the steamship company and Bowring be restrained from shipping the cars outside of New York while the case is pending in court, and the urgency of action at the present time is indicated by the statement that the thirteen Model Ts in question are aboard ship all ready to start for New Zealand.

The Ford claim is that it is making a strenuous effort to protect its New Zealand dealer, its policy being not to permit anyone else to ship Fords into a dealer's territory. Despite the fact, it claims that Bowring & Co., apparently having found Ford customers of their own in New Zealand, sought for cars to fill the orders and, not being able to secure them from the Ford company, managed to get them from the Ford company's Chili dealer, so that instead of the cars being on their way to Chili, as the Ford company supposed, it learned at the last minute that the original "L. A. C. Valparaiso" shipping mark had been rubbed off the cases and "S. I. A. Dunedin" substituted. Dunedin is a New Zealand port.

The injunction is asked especially against the captain of the Minnehaha, who is the man at present in charge of the cars in their place aboard ship at the docks in New York City. The request also is that Bowring & Co. be restrained from delivering the cars to any of their agents or representatives in New Zealand or anywhere else.

Taft-Pierce Sues Mitchell-Lewis.

Just why the Mitchell-Lewis Motor Car Co., of Racine, Wis., broke a contract it made February 29, 1912, with the Taft-Pierce Mfg. Co., of Woonsocket, R. I., whereby the latter was to build jigs, tools and other equipment for the production of 1913 Mitchell cars, is not stated in the complaint which the Woonsocket company has filed in the New York City Court against the automobile manufacturing company, but the tool producers claim the breach was unwarranted and demand damages of $434.79.

The Taft-Pierce company claims the contract was cancelled March 8, 1912, and that up to that time it had expended $198.38 in materials and labor; $230.41 is asked for the expenses and services of two men who were engaged to go to the factory in Racine to prescribe and make rough drafts of tools and jigs but who were held in Collingswood, Ohio, by the wreck of the 20th Century Limited the night of March 6, 1912. When the Woonsocket company offered to rush two other men to Racine, it claims, the offer was refused. An attachment, which was secured when the claim was filed, was vacated last week, when the Mitchell company filed a bond.

Knox Formally Declared a Bankrupt.

Growing out of the petition filed on January 20th last by three minor creditors, the Knox Automobile Co. of Springfield, Mass., was formally adjudicated a bankrupt on Monday, 10th inst. A meeting of the creditors will be held on either February 21st or 28th, at which trustees will be chosen and at which time it is believed arrangements will be effected that will permit of the projected reorganization, of which the bankruptcy proceedings constitute but the first step.

Nyberg Denies Report from Tennessee.

Despite press reports from Chattanooga, Tenn., that he had disposed of his interests in the branch factory which he established in that city last year, Henry Nyberg, of the Nyberg Automobile Works of Anderson, Ind., denies that he has done anything of the sort. The newspaper reports had it that Nyberg had sold his Chattanooga holdings to local capitalists whose purpose it was to enlarge the plant and devote it entirely to the production of six-cylinder cars.

French Tire Seeks American Favor.

The Etablissements Bergouguan of Clermont-Ferrand, France, which manufactures the Gaulois tire and which claims to be the second largest tire manufacturing company in the world, is preparing to make a bid for the American trade, having established a branch in New York City. It is in charge of Jean Grenier, who was in charge of the Montreal branch which the Gaulois people maintained for several years.

Saunders Forms a British Company.

Leslie R. Saunders, the American inventor of the gasolene saving device which bears his name, has registered the Leslie R. Saunders & Co., Ltd., under the laws of Great Britain. Its authorized capital is $20,000 in $5 shares. No. 106 Charing Cross Road, London, is named as its principal office. Its directors are Saunders himself, E. D. Stead and S. A. Cairns.

COURT DECLARES INVENTION LACKING IN SAGER BUMPER

Rochester Company Loses Suit When Grossman and Auto Bumper Appeal—Lower Court Favored Sager, But Unwillingly.

Hopes which were raised for the United States Auto Bumper Co., of Chicago, and the Emil Grossman Co. of New York City, when Judge Hough in the United States District Court for the Southern District of New York, on May 3, 1912, declared himself compelled by precedent but nevertheless unwilling to decide against the Grossman company and its backer, the Auto Bumper company, in a patent infringement action brought by the J. H. Sager Co., of Rochester, N. Y., were realized Tuesday, 11th inst., when the United States Circuit Court of Appeals for the Second Circuit, sitting in New York City, reversed the judgment and decided against the Sager company.

The action was brought by the Sager company for alleged infringement of patent No. 885,181, granted to James H. Sager, April 21, 1908, and covering what is known as the Sager bumper; the Grossman company was marketing a bumper manufactured by the United States Auto Bumper Co. under the McGregor patent, No. 958,420, and therefore this latter concern assumed the expense of the litigation. Judge Hough in his decision last May, upholding the Sager patent, said that ascribing the dignity of invention to the device was repugnant to him but that he felt called upon to rule as he did because of precedent, part of which was based upon a decision by Judge Kohlsaat of Chicago.

The Appellate Court in commenting upon the device, whose object is to provide a spring shock deadener at the front of the car, stated that "generally speaking, this idea was old as mechanics and it was also old as applied to motor cars." The decision follows:

"Prior to Sager's application, a patent was issued to R. W. Harroun, December 10, 1907, for an 'automobile bumper' designed to accomplish the identical purpose which Sager had in view, viz., 'to protect the automobile parts thereon from damage by collision.' The Harroun bumper is mounted on the car 'by means of spring connection so as to absorb any shocks caused by a collision' and acts 'as a cushion when it is bumped against an object.' The only difference between the Harroun device and that of the patent in suit is that in the former the spring is compressed by direct action and in the latter the interposition of a lever causes the bumper to rise slightly and com-

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press the spring in a downward direction.

"A patent was granted to Edgar Thomas July 31, 1894, for a car fender designed especially for electric and cable street railway cars. The specification says: 'When the object is struck by the movable member of the fender, the force of the blow is greatly diminished by the fact that the said member is movable and also by reason of the cushioning effect of the springs or like yielding medium, so that the liability of serious injury to a person by being struck by the fender is reduced to a minimum.' It cannot be denied that if the Thomas device were inverted and applied to the front of a motor car it would produce the same result, including the rising of the buffer, as is produced by the Sager device.

"The record contains other patents having the same general purpose in view, but it is unnecessary to refer to them, as they add nothing of importance to the art as disclosed by the two patents above mentioned. We have, then, in the prior art a spring buffer bar designed to protect the lamps and front portion of the automobile and to accomplish precisely the same result as Sager. The only difference being that in Sager there is a lever arm which causes the bar to rise when it meets with an obstacle, while in the Harroun structure there is simply a spring which is pushed back on a horizontal plane, the buffer bar not rising.

"We also have in the prior art a street car fender which, if inverted and applied to an automobile, will accomplish the same result pointed out in the Sager patent. We cannot think that it involved invention, in view of the prior art as thus disclosed, to produce the buffer bar of the patent. The only change which differentiates the Sager buffer from the Harroun buffer is the introduction of the lever which causes the bar to rise slightly when it strikes an obstacle instead of being forced directly back. As this principle was well known in mechanics and is shown specifically in the Thomas patent, we think its application to an automobile, assuming it to be an improvement, was the work of a mechanic and not of an inventor.

"The District Judge relied largely, in reaching his conclusion, upon the decision in the case of Turner Brass Works vs. Appliance Manufacturing Co. in the Northern District of Illinois, the patent in issue being the patent to Harroun above referred to. We do not know what the record disclosed in that case. The only patent mentioned in the opinion is the patent to Simmns, which was held to be unavailable. We are not at all satisfied that the decision would have been as it was if the patents before this court had been in evidence. However this may be, the question here is, Did it involve invention to make the Sager buffer, in view of the prior art in the Illinois case, plus the Thomas street car fender patent and the Harroun patent itself? For the reasons already stated we think it did not.

"The decree is reversed with costs."

Peerless Issues Five-Year Statement.

Following its recent increase of capital to $10,000,000 and its semi-reorganization, the Peerless Motor Car Co. of Cleveland, Ohio, has made public a financial statement covering the five years from December 1, 1907, to December 1, 1912. It shows total sales of $22,817,295, on which the net earnings amounted to $4,070,026, which, after deducting $637,328 for depreciation and $271,211 for other purposes, leaves a net profit of $3,161,486.

The balance sheet as of November 30, 1912, shows assets as follows: Cash, $447,671; accounts and notes receivable, $298,869; prepaid interest and insurance, $35,476; plant accounts and invested, $3,664,273; inventory, etc., $2,323,435.

Liabilities — Accounts payable, $189,436; accrued interest, taxes, etc., $129,220; capital stock, $4,200,000; bonds, $1,100,000; reserve fund, $126,309; surplus, $1,024,561.

May Cut White Judgment in Half.

Because the Court of Appeals of New York State has ruled that the New York City Court acted beyond its rights in handling cases wherein the amount involved was in excess of $2,000, the Appellate Term of the Supreme Court for New York county ruled this week that a judgment for $4,422.70 secured by the White Co., of Cleveland, Ohio, against its former Brooklyn dealer, the White Motor Car Co., and Philip S. Saitta, a New York City attorney, cannot stand. The decision was to the effect that the defendant would be granted a new trial unless the complainant consented that the judgment be reduced to $2,000, the City Court's limit. The matter has not finally been settled. The suit was on notes which the Brooklyn White company gave when it contracted as dealer, the paper being endorsed by Saitta.

U. S. Motor Completes Reorganization.

As the formal successor of the United States Motor Co., the Maxwell Motor Co. has completed its organization by the election of the following directors: James C Brady, Harry Bronner, Eugene Meyer, Jr., Henry Sanderson, William E. Potter, Geo. H. Burr, W. Catchings, Wm. J. Maloney, Walter E. Flanders and W. F. McGuire. The directors, in turn, elected Flanders president, McGuire vice-president, W. B. Anthony comptroller and Carl Tucker treasurer, in accordance with previous announcements. Brady and Eugene Meyer, Jr., were members of the United States Motor Co.'s directorate and were insistently active in its affairs. The appearance of Henry Sanderson, one-time president of the Automobile Club of America, as one of the directors contains the only element of even mild surprise in connection with the formal organization.

Canadian Company in Masonic Temple.

The Royal Motor Car Co., which recently was organized in London, Ont., with an authorized capital of $500,000, has established temporary offices in the Masonic Temple building in that city. The factory site has not yet been chosen, but it is the intention to manufacture a five-passenger touring car, styled the "Royal 30," which will sell for about $1,600. The officers of the company are: D. J. Cowan, president; C. C. Wright, vice-president; D. W. Henry, secretary; R. C. Eckert, treasurer; F. G. Mitchell, managing director.

Superior Absorbs Knickerbocker Brass.

The Superior Lamp Mfg. Co., which manufactures Superior lamps and electric horns, has taken over the business of the Knickerbocker Brass Goods Co. at 124th street and First avenue, New York. Henry Futterman is president of the Superior company. He also is interested in the New York Coast and Auto Lamp Co. A. L. Futterman, previously identified with the Knickerbocker Brass Goods Co., is vice-president of the Superior company.

Fire Destroys Double Fabric Plant.

Fire on Saturday night last, 8th inst., destroyed the W. H. McIntyre building in Auburn, Ind., which was occupied by the Double Fabric Tire Co. and the W. H. McIntyre Co.'s retail salesroom. The tire company's equipment was completely ruined and 10 McIntyre automobiles and a large number of buggies were destroyed.

Hermes Acquires Cincinnati Factory.

The Hermes Motor Co., which was organized in Cincinnati, Ohio, several months since, and of which Albert Kleyboldt is president, has acquired a factory on Bluerock street, near Hamilton avenue, in which the first Hermes car is nearing completion. It is a six-cylinder, 50-horsepower model, having a wheelbase of 124 inches.

Cole Denies Contemplating Removal.

Reports, printed in Detroit, that the Cole Motor Car Co. contemplated removal to that city from Indianapolis are emphatically denied by the Cole officials; they say there is absolutely no truth in the story.

The Hill-Standard Mfg. Co. of Anderson, Ind., is about to engage in the manufacture of wire wheels.

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The Week's Incorporations

Los Angeles, Cal.—Acme Electric Auto Works, under California laws; authorized capital, $10,000; to operate a garage for electric cars.

Melrose, Mass.—Auto Adjunct Co., under Massachusetts laws; authorized capital, $50,000; to deal in motor cars and supplies. Corporators—J. E. Knapp and others.

Chicago, Ill.—Feldt Motor Co., under Illinois laws; authorized capital, $1,000; to deal in motor cars. Corporators—Theodore Rohn, August F. Feldt, Louis G. Isaacs.

San Francisco, Cal.—Panama Rubber Co., of California, under California laws; authorized capital, $1,000,000; to manufacture tires. Corporators—W. D. Newerf and others.

Mercedes, Tex.—Sterling Automobile Co., under Texas laws; authorized capital, $10,000; to deal in motor cars. Corporators—A. G. Crawford, W. D. Chadwick, G. E. Simpson.

Elyria, Ohio—Garford Engineering Co., under Ohio laws; authorized capital, $100,000; to manufacture motor parts. Corporators—Sigmund Sanger, Walter F. Brown, E. C. Froelich.

Seattle, Wash.—Hugh A. Baird Motor Supply Co., under Washington laws; authorized capital, $10,000; to deal in motor car supplies. Corporators—Hugh A. Baird, George Emms.

Detroit, Mich.—Read Motor Car Co., under Michigan laws; authorized capital, $1,000; to manufacture and deal in motor cars. Corporators—Ray J. Read, Ray Herald and others.

Terre Haute, Ind.—Johnson Bros. Motor Co., under Indiana laws; authorized capital, $70,000; to deal in motor cars. Corporators—Louis J. Johnson, J. W. Sackrider, Julius Johnson.

Cleveland, Ohio—Chandler Motor Car Co., under Ohio laws; authorized capital, $1,000; to deal in motor cars. Corporators—Isador Grossman, Claude W. Shimmon, Harry C. Gahn.

Detroit, Mich.—Detroit Coil Co., under Michigan laws; authorized capital, $10,000; to manufacture motor car devices. Corporators—C. C. Cleverdon, Joseph R. Cleverdon, John F. Stobb.

Oneida, N. Y.—Federation Supply Co., under New York laws; authorized capital, $150,000; to deal in motor car supplies. Corporators—Howell D. Crim, Timothy Curtain, Albert J. Seaton.

New York, N. Y.—Owners Purchasing Assn., under New York laws; authorized capital, $5,000; to deal in motor cars—Corporators—Leonard J. Field, Irving P. Regensburger, both of 1733 Broadway, Charles Olsen, 74 Broadway.

New York, N. Y.—Club Garage, Inc., under New York laws; authorized capital, $5,000; to operate a garage. Corporators—Jerome A. Davis, 605 West 11th street; Thomas A. Kilfoil, 251 West 109th street; Samuel I. Goldberg, 37 Liberty street.

Brooklyn, N. Y.—Williamsburg Plaza Garage, Inc., under New York laws; authorized capital, $1,000; to operate a garage. Corporators—Louis Cantoni, 17 Hillsdale avenue, Jamaica; Frank Furnell, 312 Keep street; Adolph Furnell, 197 No. 6th street.

New York, N. Y.—Eureka Machine Co., under New York laws; authorized capital, $5,000; to manufacture motor car accessories. Corporators—Joseph Prosky, 920 Tiffany street; Phillip Frankel, 28 Burling Slip; Frank A. Dillingham, Millburn, N. J.

New York, N. Y.—Manhattan Automobile

SANFORD MOTOR TRUCK CO'S RECENTLY ACQUIRED FACTORY BUILDING IN SYRACUSE, N. Y.



The building is located on St. Mark's place between the Erie Canal and West Fayette street and measures 160 x 138 x 44 feet. It will permit the output of Sanford trucks to be doubled.

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Club, Inc., under New York laws; authorized capital, $100,000; to conduct a social organization. Corporators—F. D. Dorman, Belleclair Hotel; A. B. Cordner, Riviera Hotel; E. E. Schwarzkopf, 233 West 83d street.

New York, N. Y.—Cortelyou Starter Co., Inc., under New York laws; authorized capital, $25,000; to manufacture motor starters. Corporators—John H. Miller, 61 West 108th street; Isaac B. Parker, 1201 Broadway; Otto F. Ochs, 141 West 19th street.

New York, N. Y.—Western Vehicle Co., Inc., under New York laws; authorized capital, $1,000; to manufacture motor vehicles. Corporators—Harry Davis, 76 West Tremont avenue; William E. Williams, 1948 Bathgate avenue; Charles M. Frost, 1960 Valentine avenue.

Brooklyn, N. Y.—Royal Garage & Machine Works Co., under New York laws; authorized capital, $3,000; to operate a garage and repair shop. Corporators—Frederick Kongeter, 2656 Pitkin avenue; William Schwenn and Louisa A. Schwenn, both of 779 Monroe street.

New York, N. Y.—Albert E. Eldredge Corp., under New York laws; authorized capital, $7,000; to deal in motors. Corporators—Albert E. Eldredge, 75 Echo avenue, New Rochelle; John J. H. Peillon, 532 West 143rd street; Julia M. Wilkinson, 60 Pearl street, Paterson, N. J.

Tarrytown, N. Y.—J. D. Maxwell Motor Corp., under New York laws; authorized capital, $10,000; to manufacture motor cars. Corporators—J. D. Maxwell, Tarrytown, N. Y.; James P. McManus, 361 50th street, Brooklyn; Leander F. Sniffen, 3411 Fort Independence street, New York City.

Tarrytown, N. Y.—Maxwell Motor Co., Inc., under New York laws; authorized capital, $10,000; to manufacture motor cars. Corporators—Jonathan D. Maxwell, 121 North Broadway; James P. McManus, 361 50th street, Brooklyn; Leander F. Sniffen, 3411 Fort Independence avenue, New York.

Recent Losses by Fire.

St. Paul, Minn.—S. L. Rader, 2844 12th avenue, garage damaged. Loss, $2,500.

Buchanan, Mich.—Lee & Porter Mfg. Co., factory partially destroyed. Loss, $75,000.

Syracuse, N. Y.—New Process Rawhide Co., factory offices damaged. Loss, $8,000.

Peoria, Ill.—Avery Mfg. Co., wheel house, grinding house, steel room and blacksmith shop destroyed. Loss, $225,000.

New York, N. Y.—Louis Burkhardt, 136 West 105th street, garage and seventeen cars destroyed. Loss, $100,000.

"PROS" AND "ANTIS" LINING UP ON NO-SHOW PROPOSAL

N. A. A. M. Executive Committee Votes to Continue Chicago Show —Suggestion of Summer Show in Detroit Advanced.

Despite the preponderance of favorable views received by Albert L. Pope, of the Pope Mfg. Co., in response to his suggestion that the national automobile shows be discontinued, it already has become evident that he and those who share his beliefs must overcome strenuous opposition before they can carry their point.

The executive committee of the National Association of Automobile Manufacturers, at its meeting in Chicago last week, practically ranged itself against the Pope idea. Pope himself is a member of the committee, although he was not present at the meeting, but the eight members who were in attendance voted unanimously to repeat the Chicago show, at least, in February, 1914. The N. A. A. M. has nothing to do with the New York show. The members who so voted were: S. T. Davis (Locomobile), Charles Clifton (Pierce-Arrow), Hugh Chalmers (Chalmers), L. H. Kittredge (Peerless), W. C. Leland (Cadillac), H. O. Smith (Premier), H. H. Rice (Waverley). W. E. Metzger, president of the association, was in the chair and, of course, did not vote.

There were also present at the Chicago meeting Samuel A. Miles, general manager of the N. A. A. M., and J. S. Marvin, traffic manager. Miles himself holds exclusive rights to stage automobile shows in the Chicago Coliseum, and since last week's meeting his office has supplemented the action of the N. A. A. M. executive committee by press matter designed to indicate that the continuation of the Chicago show, at least, is highly desirable. This publicity matter states that, far from desiring the show to be abandoned, a number of the car manufacturers have asked that the 1914 pleasure car section cover a period of 10 days instead of seven days, as heretofore.

It also is stated that 3,400 dealers attended the Chicago show and that some manufacturers who originally expressed themselves as favorable to Pope's idea since have explained that their attitude has to do with local shows and not the national exhibitions in New York and Chicago.

On the other hand, there are those who have rallied even more firmly to the Pope standard and who emphasized their position that the shows have outlived their usefulness, and that the great expense and far-reaching disorganization of factory and sales operations which they cause each year more than offsets any possible good they may serve.

One prominent manufacturer, who is not of the number that engages in spread-eagle show advertising, declares that the New York show alone entailed an expense of $30,000. Another, M. J. Hammer, general manager of the Abbott Motor Car Co., asserts that the industry owes a debt to Colonel Pope for taking the lead in the movement. He does not believe abandonment of the shows will cause the trade to suffer any reduction of business, and holds that if a national automobile show must be held it should occur during the summer, at about the time the manufacturers introduce their new models, and should be held at a midway point, preferably Detroit.

All of which makes evident that when the N. A. A. M. executive committee convenes in regular session next month there will be scope for pointed and momentous discussion.

Changes Among Prominent Tradesmen.

W. H. Williams has been promoted to the post of advertising manager of the Franklin Automobile Co. of Syracuse, N. Y. Previously he was assistant to George H. Bryant, who recently resigned to join the Locomobile staff.

C. A. Forster has been appointed commercial manager of the Maxwell Motor Co.—the old United States Motor Co.—and will make his headquarters in Detroit. Previously Forster was assistant general manager of the Burroughs Adding Machine Co., of Detroit.

Edwin Irving has been appointed manager of the Peerless branch in New York City, succeeding A. N. Dutton. Previously, Irving was manager of the National Electric Light Co. of Toronto, Can., and, it is stated, long has been identified with the Terry interests which recently acquired control of the Peerless Motor Car Co.

Arthur J. Interrieden has been appointed sales manager for the Jones Speedometer Co., of New York. For many years he was the manager of the Warner Instrument Co.'s branch in the big city, and when the Warner interests were merged into the new Stewart-Warner Speedometer Corporation he became the latter's Eastern sales manager.

W. W. Wuchter, former president and general manager of the Swinehart Tire & Rubber Co. of Akron, Ohio, has become connected with the Gibney Tire & Rubber Co. of Philadelphia, Pa. Previous to his connection with the Swinehart establishment, Wuchter had enjoyed many years' experience with the Goodrich and Firestone companies.

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In the Retail World

Rosenhauer & Echerman have opened a garage in Early, Ia.

George W. Hoch, Jr., is having a garage erected in Canonsburg, Pa.

The Modern Garage Co., of Titusville, Pa., is building a new garage.

H. S. Titus & Son have opened a garage and supply store in Penns Grove, N. J.

W. C. Radley of San Diego, Cal., has sold the Grant Hotel Garage to George F. Barner.

H. S. Pulliam, of Lawton, Okla., is remodeling a building in which he will open a garage.

Hart & Starry have opened a garage in Olin, Ia. They also have secured the Krit agency.

Walter S. Vanderbilt has embarked in business in Tarrytown, N. Y. He has the Studebaker agency.

Emil Hulstrom has purchased a bowling alley building in Woodhull, Ill., and will convert it into a garage.

Leslie Tuthill is erecting an $8,000 garage in Visalia, Cal. He will operate under the style Main Street Garage.

The Red Wing Auto Co. and the Remshandt & Oliva Auto Co., both of Red Wing, Wis., have consolidated.

J. H. Benjamin, Jr., and A. C. Benjamin have purchased the Ford Garage in Red Bluff, Cal. They will operate it.

S. A. Collins & Co., of 2124 Cummings street, Omaha, Neb., plan to erect a new garage; the estimated cost is $20,000.

John Paire, of Baxter & Paire, garagemen in Hillsboro, has bought out his partner; he will continue the business alone.

Stephen Gyrfas, of Newark, N. J., has had plans prepared for a two-story brick garage and machine shop; it will cost $5,000.

W. S. Arbogast has purchased the interests of A. D. Stocker in the Economical Tire Co., of 415 East 3d street, Dayton, O.

Charles Sands has opened an automobile supply store in White Plains, N. Y. He is trading as the New York Auto Supply Shop.

A. N. Black has given up his agency in Peoria, Ill., and will devote all his time to the real estate business; he handled the Ford.

H. L. Kemp and G. H. Larned have opened salesrooms in Boston at 1070 Boylston street; they represent the Westcott line in New England.

O. F. Embertson and H. J. Ilson of Litchville, N. D., are about to open a garage in Valley City, in the same State; Ford cars will be stocked.

B. S. Bryant and E. J. Bigue have opened a garage in Claremont avenue, in the residential section of Oakland, Cal. The name adopted is Service Garage.

Thomas Hay, former Chicago Ford manager, has taken over the Staver agency for Northern Illinois, Eastern Iowa, Southern Michigan and all of Indiana.

The Colonial Motor Co., of Baltimore, Md., has opened a new garage on North avenue, east of Charles street; chauffeurs' recreation rooms are a feature.

Knox & McCauley, of Abilene, Tex., have sold their supply business to the Fulwiler Electric Co. The former will devote themselves to their garage buisness.

Robert Kilgour & Sons have purchased the Ontario Motor Car Co. of 18 Bloor street, East, Toronto, Ont. The deal carries with it the Packard agency.

The Faissole Auto Co., Inc., of 131 West 42d street, New York City, is about to change its name to Cosmo Auto & Touring Co. Charles A. Faissole is president.

C. D. Miller has disposed of his interest in the Grand Rapids (Mich.) Auto Co. His offices of president and treasurer have been filled by the election of A. B. Olmstead.

J. I. McFarland has inaugurated a two-story garage, 40 x 100 feet, adjoining the Kimball Hotel in Lodi, Wis. It cost $12,000. He will handle the Ford and Studebaker lines.

City Automobile Co. is the name which has been chosen by P. J. Albers and H. H. Hagedorn, who recently entered the trade in Luverne, Minn. They have the Overland agency.

The Reading (Pa.) Motor Vehicle Co. has been formed with Harry E. Eisenbise as manager; it will distribute Rowe trucks and a line of fire apparatus which incorporates patents held by Eisenbise.

Fred Offenhaeuser and Frank W. Dotsch are about to establish a garage business in White Plains, N. Y. They formerly were employes of the Maxwell-Briscoe Motor Co., of Tarrytown, in the same state.

Harry F. and W. G. Bailey, who have conducted a garage and supply store in Hartford, Conn., on George street, have dissolved partnership; the former will continue the business under the style Harry F. Bailey & Co.

The Franklin Automobile Co.'s branch in Rochester, N. Y., at 86 North Adams street, has been taken over by G. R. MacCollum and T. J. Stevens, who will operate it on a dealership basis; the style will be Franklin Motor Car Co.

The Rubber Tire Repair Co., of Kansas City, Mo., has taken over the Shawmut agency; Henry A. Winter, manager of the company, has been made factory representative of this brand of tire in the territory in and about Kansas City.

The Peerless Motor Transfer Co., of Washington, D. C., has changed its style to C. B. B. Motor Co. The concern retains its location at 511 I street, Northwest, and will continue to handle Peerless cars and trucks and Kelly and Modern trucks.

The Martin-Matteson Garage Co., formerly located on North Seminary street, in Galesburg, Ill., has completed a new garage at Cherry and Waters streets; there is storage room for 30 cars. The company has the Apperson and Paige agencies.

The King Motor Sales Co. has entered the selling field in Kansas City, Mo., at 1625-27 Grand avenue, selling King cars. C. E. Hathaway, who has been in the trade in and about Kansas City for eight years, is at the head of the new business.

Charles Colton has sold his interest in the Milbank (S. D.) Auto & Supply Co. to Arthur Partridge, who, with Albert Partridge, constitutes the remainder of the firm; they will continue the business as heretofore, retaining the Ford, Chalmers and Studebaker agencies.

E. L. Kaufman of Keota, Ia., has purchased a half interest in the Lawler Garage in Wellman, in the same State; the name of the business has been changed to Kaufman-Lawler Auto Co. Kaufman will act as manager and the building will be remodeled and enlarged.

Henry L. Wedemeyer, for the last two years superintendent of the Foster Gear

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Co., of Columbus, Ohio, has taken over the garage business of the Adamson Auto Co. in that city, located at 35-39 West Mound street; the new style is Adamson-Wedemeyer Auto Co.

Frank V. P. Ellsworth, who toured from Hot Springs, Ark., to San Antonio, Tex., in November in the interests of a tire company, has located permanently in the latter city, where he has launched the Jackson Auto Co. Jackson cars are stocked. Ellsworth is president of the company.

J. J. Schuur has entered the trade in Jackson, Mich. He has opened a garage and salesrooms at 115 Eleanor street and has secured the agencies for the products of the Maxwell Motor Co., which was the United States Motor Co. Schuur is the owner of a basket factory at Paw Paw, Mich., and also is a large celery shipper.

Edward Williams and George Medlam, copartners, trading as the Medlam Automobile Co., in Columbus, Ind., have dissolved partnership; Williams will continue to operate the garage, which is located on South Franklin street. The Overland agency, which was conducted by the partners, has been taken over by A. T. Griffith.

To deal in used cars the United Automobile Clearing House Co. has been formed in Cincinnati, Ohio, with quarters at 324-26 West Court street. The officers are: President, Thomas A. Reilly; vice-president, S. D. Bromley; secretary, Edwin P. Bernardi; treasurer, A. M. Hirsch. Private owners will be charged a selling commission of 10 per cent.

W. W. Denis has purchased the interest of Robert Wynn in the Standard Auto Garage of Sault Ste. Marie, Mich., and the business has been renamed Lock City Auto Co. The officers of the new company are: President, A. H. Passmore; secretary and treasurer, W. W. Dennis; manager, Percy Elves; the transfer of interests carried with it the Oakland and Buick agencies.

W. M. Whitney & Co., of North Pearl street, Albany, N. Y., have purchased the building of the Buick Motor Car Co., at Washington avenue and South Swan street and will remove to that location April 1. The Buick building is of four stories, and a fifth may be added later. The Whitney company recently took over the United Motor Albany Co. and the Albany Motor Car Co., which gives it the agencies for the Maxwell, Cadillac and Mercer, in addition to the Fiat, which it formerly held. Westcott Burlingame, the company's manager, formerly was with the Buick agency, but was assistant manager of the United Motor branch when it was taken over. The Whitney company does not acquire the Buick agency.

COHEN SUES FOR BLIGHTED HOPES AS O.N.L.Y. DEALER

Claims Demonstrating Car for Which He Paid $1,000 Has Yet to Make Its Appearance—Demands Profits He Didn't Make.

According to the attorney for Dudley H. Cohen, of New York City, the O. N. L. Y. Motor Car Co., of Port Jefferson, L. I., whose claim to fame rests on a motor having a 7⅞-inch stroke, has been working diligently since last September in an effort to turn out a demonstrating car for Cohen, who claims he paid $1,000 for such a vehicle in the expectation that he was going to sell 200 O. N. L. Y.s in the State of New Jersey in the year beginning September 3, 1912, which venture, he says, came to naught. His whole tale of grievances, which takes the form of the complaint in a suit in the Supreme Court for New York county, is summarized in a request for $14,244, and on the strength of his story the court on Friday, 8th inst., granted him an attachment for that amount.

Cohen's plaint is that he signed up as New Jersey distributer, first paying $1,000 for one of the 7⅞-inch-stroke cars, and contracted for 200 cars, to be delivered in twelve equal monthly instalments. He also was permitted by the contract to sell 40 cars to sub-dealers in his territory, and states that he executed these sub-contracts and was all ready to put the cars into the field but that the Port Jefferson company failed to get even so far along as to deliver the demonstrating car.

His claim of $14,244 is arrived at through the combination of several items, the first of which is the $1,000 he paid for the demonstrating car and for which he got no car and has not been able to get his money back. Claim No. 2 is a profit of $2,500 which he would have received on the 40 cars had he delivered them to his sub-dealers, the profit for him on each car being $62.50. The third claim consists of the profits which the sub-dealers would have made, buying at $1,062.50 and selling at $1,250 had Cohen been able to deliver the cars to them, and since he was not he includes this item as being a claim for which the O. N. L. Y. company has made him liable. It is $7,500. Also he expected to make a profit of $70 on the equipment for each car, which item is $2,800, and besides this he claims to have spent $444 in various ways.

Notes Involve Dealer in Trouble.

Elmer E. Rhodes, a dealer in Joliet, Ill., and who also has earned some fame as a racing driver, has become involved with the authorities in that city and has been held to await the action of the Will county grand jury because of alleged irregularities in a check deal following the sale of a car to Mart Shire, a retired Joliet farmer. According to the charges, Rhodes sold the car to Shire and in part payment took two notes aggregating $1,000, which he turned over to the Manhattan bank as collateral security on a loan. Later, it is said, he induced Shire to make payments of $400 and $300 on the notes, the later being in ignorance of the bank's equity in the paper. The specific charge is that Rhodes held out $400 which should have been turned over to the Manhattan bank.

Minor Business Troubles.

The Glide Automobile Co., of 517 Second avenue, South, Minneapolis, Minn., has filed a voluntary petition in bankruptcy; its debts amount to $3,016.88 and its assets to $4,572.90.

Judgment for about $6,000 was taken this week by the Benz Auto Import Co., of New York City, against the Hearne Motor Co., of Chicago, the claim being for cars and parts supplied to the Hearne company as Benz dealer. The Hearne company is now involved in bankruptcy proceedings.

Upon a claim of $19,263 made by the Dayton Auto Truck Co., nine trucks, the property of the Motor Renting Co., of 145 West 110th street, New York City, are to be sold at auction by the sheriff Monday, 17th inst. The trucks have been taken on a writ of seizure and the sale will be held at 524 West 30th street.

Gere Goes Into Electric Vehicles.

Theodore D. Gere, who has been acting as one of the receivers of the Champion Wagon Co., of Owego, N. Y., since January 9, 1911, has asked to be relieved of his duties. He, with several other men, has organized the Empire Electric Vehicle Co., in Owego, and it is his desire to devote his entire time to that enterprise.

Rubber Company Beats Garage Firm.

Weingarten & Durst, garage and supplymen in New York City, were unsuccessful in defending a suit this week, brought in the New York City Court by the National India Rubber Co., the rubber company asking the face value of a note and interest; the amount awarded the plaintiff was $1,059.

Michelin Sues an Ohio Customer.

The Michelin Tire Co., of Milltown, N. J., is the complainant in an action which was filed last week in the Common Pleas Court in Canton, Ohio, against the Auto Service Co., for $585; the sum is claimed to be the balance due on an account.

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PARCEL POST AND ACCESSORY DEALERS.

What will be the effect of the parcel post on the retail dealers in all lines of trade is one of the questions growing out of the government's new service which is not yet capable of answer. In some measure designed to strike at the so-called express monopoly, there at all times have been forebodings that once inaugurated the service would make things unduly uncomfortable for the retailer, particularly the small ones in small towns, if it did not result in forcing many of them out of business.

It had been thought probable that the gigantic mail order houses would so greatly benefit by the new rates that the small dealer would be unable to cope with them, but regardless of such possible effects it already has become clear that the almost immediate effect of the parcel post has been to give the local retailer more scope than ever to meet the competition of mail order establishments.

Whereas, under the old order of things, the latter could send their smaller packages through the mails for any distance at a flat fourth class rate, the zone system created by the new regulations eliminates that advantage and requires that the amount of postage shall be governed by the distance the package is to be transported. Thus, the cost of mailing, say, a ten-pound package 1,500 miles is $1.01, but a local dealer can send the same package 50 miles for 32 cents. The difference in many cases will be sufficient to more than offset the difference between the catalog prices of mail order goods and the retailer's prices.

Whether the savings on "short distance goods" will equalize things for the mail order people, probably they themselves will not be able to tell for at least a year.

At this time, it appears that to offset the unlooked-for conditions, the mail order people must do one of two things; reduce the price of their wares or set up branch establishments at various central points. In either case, it means a marked reduction of their earnings. The discomfiture of the mail order houses, however, will cause few tears to be shed. Rather does it indicate that the parcel post has opened to local tradesmen unlooked-for opportunities.

There is no good reason why the wide-awake dealer in automobile accessories cannot immediately and very considerably enlarge his scope and acquire control of a large part of the trade within his zone which previously was beyond him. To do so will require a display of real enterprise and some small expenditure for printed matter and postage stamps. Dealers in other lines already have grasped the opportunity and the automobile accessory tradesman who does not do likewise will have himself to blame if the parcel post cuts into his profits or otherwise causes discomfiture.

PUTTING ENGINEERING PRACTICE TO SCORN.

"Revolutionizing" motors have been so very numerous of late years that most engineers are likely to give scant notice to any newcomer, particularly one that is devoid of such things as piston rings, so dear to the heart of all engineers, and so generally considered to be absolutely indispensable. Still, the Tismer engine, which was illustrated and described in Motor World last week, has no piston rings, and yet it works and for the elimination of the rings the inventor would seem to have a very good reason.

It is his opinion that the rings serve mostly to scrape the cylinder clear of the lubricant, which, of course, must be constantly renewed to avoid metal-to-metal contact, and to eliminate the "waste" represented by the constant replenishment he provides a perfectly plain piston, which fits so loosely in the cylinder that the film of oil is comparatively thick, the theory being that the thick film prevents rapid dissipation of heat and at the same time prevents loss of compression as effectively as would piston rings.

It is even more difficult to comprehend why this engine runs on heavy oil sucked into the cylinder in a solid body, when it is not easy to burn even lighter oils with the aid of complex spraying and injecting devices. Yet this is what the engine does; at least, it takes its fuel through a plain pipe and a hole in the head, and if there is any spraying action it is unintentional.

It may be that more extensive tests will develop flaws in Tismer's reasoning and defects in his engine. The fact remains, however, that Tismer has disputed the necessity—even the advantages—of things that hitherto have been deemed indispensable, and his motor seems to bear him out in every way. Even if the engine does not come up to the naturally high expectations of the inventor it should furnish considerable food for thought; while if it fulfils its promise it will upset theories that have been considered impregnable since the first gasolene motor made its initial revolution.

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BROOKLYN GARAGEMEN UNITE TO COMBAT EVILS OF TRADE

Batt Heads New Organization, Which Intends to Deal With the Gasolene Question—Other Purposes To Be Served.

The incorporation last week of the Brooklyn (N. Y.) Garage Owners' Board of Trade has served to bring into greater prominence another phase of the "gasolene situation" with which garagemen across the river from Manhattan have been wrestling for more than a year, or since the price of fuel first started on its eventful upward career. The particular phase lies in the retail sale of gasolene by small dealers whose "overhead" expense is low at a price which prohibits what one prominent garageman and dealer in the new organization apostrophized as a "living profit," and it is one of the principal objects of the organization to "stamp out this evil"—to prevent cut-throat methods in the sale of fuel and to maintain an arbitrary standard retail price which shall insure a reasonable margin of profit. Just how the problem will be attacked is not divulged, though it is freely hinted that the necessary steps will be directed against those who supply the fuel to the garages and not directly against the gasolene dealers themselves.

Of course, the organization has other objects as well, though the regulation of the price of fuel is one of its principal ones, and if it does not do all it intends to do it will not be for lack of strength. Already a majority of the more prominent garagemen in Brooklyn have "signed up" and more are clamoring for admission. Charles F. Batt, a veteran of the trade and head of the Grant Square Garage Co., of 1378 Bedford avenue, where headquarters of the Board of Trade have been established, is president and associated with him are Anthony J. Sweeney, of Sweeney & Nail; E. J. Dennie, of the Clinton Garage Co.; A. W. Blanchard, the Brooklyn Fiat dealer, all of whom are vice-presidents; J. F. McCormick, of Bishop, McCormick & Bishop, who is treasurer; and Arthur J. Farrel, of the Farrel Auto Co., who is secretary. The directorate is composed of these men and C. M. Bishop, Norman A. Bradt, Emil Bauer, H. F. Cornelius, George V. Johnson, W. H. Kowenhoven, J. W. Mears, H. Pastre, F. M. Powell, Oliver Spitzga, Frank Sands, W. S. Wood, Robert P. Lumely, J. Van de Veer, J. C. Kirkham, H. L. Carpenter, and D. M. Hasbrouck. Practically all of these men are members also of the Brooklyn Automobile Dealers' Association, which, of course, is a separate and distinct organization; it is the intention that they shall not conflict in any way.

Briefly, it is the purpose of the newly formed Board of Trade to foster what is judged to be helpful and to combat what is judged to be harmful legislation aimed at the regulation of public garages; to obtain and circulate among its members reliable and accurate information concerning investments and the management and operation of garages, and "to secure uniformity and certainty in the customs and usages of trade and commerce in governing the sale and storage of automobiles."

Seacoast Takes Over Two Garages.

The so-called National Automobile Owners' Association of Asbury Park, N. J., which was formed last summer, has been absorbed by the Seacoast Garage & Supply Co. of that city, which was incorporated three months ago with an authorized capital of $25,000. The absorption was largely in the nature of a change of name, as the officers of the association also were taken over by the Seacoast enterprise. They are: John Hulshart, president; Arnold N. Hulshart, vice-president; William F. Pattison, secretary and assistant manager; Dave W. Edwards, treasurer and general manager. The Seacoast company will control the Grove Garage in Asbury Park and the Woolley Garage, which is in Bradley Beach, N. J.

Winton Opens Three More Branches.

Having decided to increase considerably the number of its branch houses, the Winton Motor Carriage Co. is proceeding with the work. Among those recently established are branches in St. Paul, Portland and Walla Walla. The manager of the St. Paul branch is Le Roy Eschner, who previously was connected with the Winton branch at Chicago, while the men in charge of the Portland and Walla Walla branches are, respectively, H. R. Roberts and E. H. Gates.

Building for Studebaker in Omaha.

For the occupancy of the Studebaker Corporation, contracts have been let for the erection at Twenty-fifth avenue and Farnam street, in Omaha, of a four-story building, 75 x 140 feet; it will have a front of red brick with cream or white trimmings. As soon as completed, the Studebaker branch in Omaha will remove from its present address, 2026 Farnam street.

Woodward Succumbs to Pneumonia Attack.

Roy Woodward, who represented the Kelly-Springfield Motor Truck Co. in the South, died of pneumonia in Indianapolis on Thursday last. He was 29 years of age and a native of Bloomington, Ind.



February 8-15, St. John, N. B.—First annual show of the New Brunswick Automobile Association in the Drill Hall.

February 8-15, Youngstown, Ohio—Annual show of the Youngstown Automobile Show Co. in the Auditorium and Annex.

February 8-15, Hartford, Conn.—Sixth annual show of the Hartford Automobile Dealers' Association in the State Armory.

February 10-15, Minneapolis, Minn.—Minneapolis Automobile Show Co.'s show in the National Guard Armory.

February 10-15, Chicago, Ill.—National Association of Automobile Manufacturers' 12th annual show in the Coliseum and 1st Regiment Armory. Commercial vehicles only.

February 12-15, Geneva, N. Y.—Annual show in the State Armory, under the auspices of the Ottawa Valley Motor Car Association.

February 15-22, Albany, N. Y.—Annual show of the Albany Automobile Dealers' Association in the State Armory.

February 15-22, Newark, N. J.—New Jersey Exhibition Co.'s Sixth annual exhibit in the First Regiment Armory.

February 16-23, Richmond, Va.—Richmond Automobile Dealers' Shows Co.'s exhibit in the Horse Show building.

February 17-27, Kansas City, Mo.—Kansas City Automobile Dealers' Association's show in Convention Hall. First week pleasure cars; second week commercial vehicles.

February 17-22, Jackson, Mich.—Jackson Automobile Dealers' Association's annual show.

February 18-22, Baltimore, Md.—Baltimore Automobile Dealers' Association's annual show in the Fifth Regiment Armory.

February 19-22, Kalamazoo, Mich.—Kalamazoo Automobile Dealers' Association's annual show.

February 19-22, Davenport, Ia.—Annual show of the Tri-City Automobile Dealers' Association in the Coliseum.

February 20-22, Canandaigua, N. Y.—Motor Car show in Hawley's Garage, under the management of A. Blumenstein.

February 22-March 1, Brooklyn, N. Y.—Brooklyn Motor Dealers' Association's annual show in the 23rd Regiment Armory.

March 8-15, Boston, Mass.—Boston Automobile Dealers' Association's annual show in Mechanics' Hall. Pleasure cars only.

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BENEFITS OF PARCEL POST ACCRUE TO LOCAL DEALER

Mail Order Houses Now Bothered by Perplexing Problems—How Zone System Gives Retailer Room to Compete.

Despite the general belief that mail order houses jumped for joy when the parcel post was inaugurated, it appears that their joy, if any, was ill-timed, or that their jumps were comparatively short ones. For, after a month of actual practice, the parcel post has caused many of the mail order people to wrinkle their brows and to resort to an extensive use of their pencils to discover just "where they are at." Similar beliefs that local retailers would be seriously affected by the competition of mail order houses has proved not wholly justified, as the more enterprising dealers, at least, have discovered that the parcel post has opened to them opportunities which previously did not exist.

Comparison of New and Old Systems.

The section of the new regulations which causes this not widely understood condition is the "zone system." While the opposing argument was that the Parcel Post would permit the mail order house to compete with the local retailer by sending cut rate goods into the retailer's territory, the mail order house is, in fact, not so well off as heretofore. Whereas fourth class matter before the adoption of the Parcel Post permitted mailable material to be sent any distance for a flat charge, under the new system the charge increases with the distance. Therefore, a mail order house in Chicago, for instance, can compete with the Chicago retailer, but as the distance between the mail order house and the customer increases and the customer falls within higher-rate zones the cost of delivery becomes heavy and the local retailer in these latter zones is able to mail goods to his customers at less cost than can the distant mail order man. The "zone system" narrows the mail order field to a restricted territory and the retailer, whose natural trade area is perhaps of 100 miles radius, is able to use the Parcel Post at less cost than the mail order house, provided the retailer is any appreciable distance from the city where the big competitor is located.

Practical Effects of the Zone Plan.

Thus, according to the law, a local dealer located, say, in Kansas or Nebraska, approximately 500 miles from Chicago and, therefore, within the fourth zone, can mail a five-pound parcel to any address within his zone—50 miles—for 17 cents, whereas, to reach the same customer, a package of the same weight would cost the Chicago mail order house 32 cents in postage. An 11-pound package, which is the parcel post limit, would cost the Kansas or Nebraska dealer 35 cents within his zone, while the Chicago mail order house would be required to pay 68 cents.

Dealers and Their "Natural" Customers.

But even these figures do not make wholly plain the advantages possessed by the local retailer, for the "local rate"—which means the rate applying to any postal district, as, for instance, a rural delivery route, the limit of which is 25 miles—is five cents per pound for the first pound and one cent for each additional pound. This means that the local dealer can send to what should be his natural customers a five-pound package for nine cents, or an 11-pound package for 15 cents, while the cost to the Chicago mail order people would be, respectively, 32 cents and 68 cents. The differences are sufficiently great to permit the wide-awake dealer to make things more interesting for mail order competition than previously was the case.

Under the old order of things, when the fourth class rate of one cent per ounce applied, regardless of distance, both the local dealer and the mail order house could mail merchandise only in parcels not exceeding four pounds, on which the rate was one cent per ounce, or 64 cents for a four-pound package. Exceeding four pounds, the merchandise became ineligible as mail matter and necessarily was shipped by freight or express.

The Plaint of a Mail Order Man.

A former mail order man, who, following the inauguration of the new post, has entered the retail trade, states that the innovation has worked a hardship to the mail order business. "To believe," he says, "that the Parcel Post as provided for under the present law is going to increase the advantages which such houses possess over the local dealer is to betray either an utter ignorance of the facts or an utter inability to reason logically. For now, instead of being on an exactly equal basis, so far as the mails are concerned, with the local retailer, the mail order house must pay postage based on the distance between its office and its customer, while the dealer is allowed to mail goods to his customer at a postage rate based on his proximity. Since the passage of the Parcel Post act there has been a marked absence of anything approaching joy in the mail order circle. A diminution of the cost of carriage on light goods only operates in the retailer's favor by permitting him to use rural free deliveries and reach his country customers far more easily than he has ever been able to do."

Solutions Needed for New Problems.

He also states that, should the mail order house attempt to meet the new conditions by establishing branches for the purpose of taking advantage of the zone rates, the overhead and other costs would at once prove a tremendous handicap to the companies, and he adds that he confidently expects to see the retailer become a worthy rival of the mail order man. Summarizing, he states:

"This new system puts every manufacturer, every jobber, every retailer, into direct competition with the mail order house and gives a tremendous advantage to the retailer and to the jobber by reason of the proportionate rate. It brings up an entirely new set of problems and difficulties in the mail order business, it must inevitably lead to the essential changes which will increase costs and diminish profits, it gives the mail order house not one single benefit to offset these disadvantages and it gives the retailer not one single disadvantage to offset the benefits."

Aetna's Insurance Plans Unfolding.

The Aetna Accident & Liability Co., of Hartford, Conn., which recently purchased the charter of the Manufacturers' Fire & Marine Insurance Co., has applied to the Connecticut legislature for permission to change the name of its acquirement to the Automobile Insurance Co. of Hartford and to increase its capital stock from $200,000 to $2,000,000.

The Aetna company only recently instituted a radical departure from previous insurance practice in formulating and offering for sale a single policy covering all forms of automobile risks, liability, property damage, collision, theft and loss of use, and its action in seeking to create the Automobile Insurance Co. of Hartford is taken to mean that the latter will be the medium through which the new policy will be exploited.

Parcel Post Not for Catalogs.

Reversing a previous ruling, the postmaster general has decreed that general catalogs cannot be shipped with merchandise at parcel post rates; they must pay third-class postage. Literature referring to a particular article may be included with it at parcel post rates, but if the printed matter deals with anything else it must be entered as third class matter. In other words, spark plugs, for instance, shipped by parcel post may be accompanied by circulars describing them, but if such printed matter refers to other articles it must pay the higher rate.

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WIDE-AWAKE MERCHANDISING In the Motor Car Field

BEING SQUARE WITH BUYERS

Attempts at Dickering Are Resented by the Man Who Knows Values—Methods Which Won and Methods Which Lost Important Sale.

In a city the name of which need not be mentioned, a man had planned to buy a car. He wanted a good one. He had certain definite ideas as to what constituted a good car, so he confined his investigations to three or four that he felt quite certain came within the range of his requirements. Investigation among friends and acquaintances, and a more or less thorough knowledge of values, gradually narrowed his interest to two cars; so he invited representatives from both agencies to call on him.

The first salesman came and submitted his complete proposition; told him exactly what he would furnish in the way of equipment; said he could have any body style he chose, any special leather for upholstery, any finish or trim, and went into the smallest details in an effort to get a masterful grasp of what the prospective purchaser wanted; then he named a price for the complete job and another price for the chassis only, with lighting and starting equipment.

Unfair Charge for Regular Equipment.

Not long afterward the second salesman arrived. And please remember that the buyer was not prejudiced in favor of either car. The scales, as far as he was concerned, were even—either car would suit.

Photographs were produced, the customer's idea of a body discussed at length and, after mechanical details were gone into to the perfect satisfaction of the customer, prices were submitted.

"Does this price include the electric starting and lighting system? Does it include a Klaxon horn?"

"No; those are extras, and will cost you $350," answered the salesman.

"No, they won't; I'll not pay a cent extra for them. Do you mean to say that you can look me in the eye and honestly say that your car is worth $350 more than the ———? Come, tell me frankly how and wherein your car is worth the extra money."

"Well, Mr. Buyer, I'll tell you what I'll do. I will include those extras at the price named."

"No, you won't!" warmly responded Mr. Buyer, "it's too late now. Nothing doing! I am going to buy a ———"

Pared Prices Shatter Buyer's Faith.

And it was too late. The buyer would not listen to argument. His faith in the salesman and his car was shattered by the attempt to get the extra money and the quick backdown when he forced the issue.

The first man had studied his customer and laid all his cards on the table during his first visit. The second man came prepared to dicker. He did not know the kind of man he was going to meet. He lost an important sale through unpreparedness.

Car buyers are becoming keen on values. They cannot be fooled, and unless the salesman is absolutely sure that his prices are justified and knows why and wherein they represent dollar-for-dollar value, he is bound to be up against it.

WHY SHOW WINDOWS SHOULD BE CHANGED FREQUENTLY.

What can you do to give your show windows a fresh interest? It's the constant change of display that interests and holds the public, and it is proper, therefore, that you should ask yourself during how much of the year has your window looked exactly as it looks to-day.

If you are an accessory dealer, remember that masses—not mixtures—of goods make the strongest appeal to the eye. Call to your aid all the adjuncts of color and light. Use signs, but not too liberally. But change and change often. Your display is for the people who are passing—and most of these pass several times a day. People get into habits.

Challenge the attention of your regular customers by your display, also. Don't let them "get used" to your windows. Wake them up! Show them something new—something different each time they come in. Change! Change! That is the secret of successful window displays.

QUICKWITTEDNESS IN SALESMEN.

History records more than once how a quick answer has saved a situation. Happy is the salesman who is gifted with the "quick come-back," which is another word for quickwittedness.

Entering the lobby of the Claypool at Indianapolis, a parts salesman ran plump into one of his best customers, the purchasing agent for a big Indianapolis factory.

"You're just the man I want to see," said the purchasing agent. "I have a bone to pick with you. I understand you make Ford a price very much lower than what we are paying. We are not going to pay a cent more than Ford."

Quick as a flash the salesman handed over his order book to the purchasing agent.

"You don't have to," he responded. "Here, take this order book and write out your own order at the same prices—only it must be for the same size part and for the same quantity."

The purchasing agent did not even ask how many Ford bought. He handed back the order book without comment. He is still buying parts from this salesman.

Good salesmanship means more than merely getting the order. It means establishing an appreciation of value in the mind of the customer so solidly that the order comes, whether you call for it or not.

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AWAKE-N DISING WORLD

UNTOUCHED SALES HARVESTS

Many Men Who Are Abundantly Able to Own a Car Never Have Been Approached—Salesman Who Canvassed Office Building.

Who wants to buy a car? Many dealers and salesmen would give some real money to be put in possession of reliable information on that point, and yet it ought not to be very hard to obtain it. The trouble with many saleswen is that they confine their energies to the small circle of their acquaintances, the leads that occasionally come from the factories; the people who "dropped in the store once to look over the line," the prospects they saw or heard the Crescent salesman had taken out, and the more or less up-to-date list of prospects that has been in the making since the business started.

Salesman Made To Dig Up Prospects.

One organiation whose name is synonymous with success uses all the old methods as far as they go and adds one that has proved mighty effective. When a new salesman is hired he is told to go out and dig up prospects. For example, in the city of Chicago one was given two weeks in which to call on every person in a certain large office building. Naturally it seemed "just like a book agent" to this salesman at first; but after three days he rather liked it. He had made many new friends and secured several valuable tips which, inside of sixty days resulted in the sale of seven cars.

Much reading of what constitutes a good salesman won't make one. It merely points out some of the ways. It suggests; and, if the man is ambitious, he will take from his reading what he needs and use it.

A few doors away from where this is being written lives a man who owns real estate valued at approximately $15,000. He is an officer in a large manufacturing company and has a yearly income in excess of $5,000. He is very busy—so busy that he has never really got down to brass tacks on the car question. He said yesterday that he had never been approached by an automobile salesman, nor has he ever received a circular letter, a catalogue or any other literature from any automobile factory or dealer. Two doors from him is a merchant who owns a handsome home, has a half interest in a large downtown business; in a word, a man who has ample means to buy and maintain a good machine. He likewise never has been approached. Three blocks away is a garage where several salesmen hang out and wonder why business is so dull.

Like the "Acres of Diamonds" Story.

It is like Russell Conwell's story, "Acres of Diamonds," in which a farmer grows so discouraged with conditions on his farm that he sells out. He goes west, where there is more money to be made, and at the end of three years returns to find that the farm which he despised contained rich coal deposits which had made his successor a rich man.

There are many dealers who are neglecting or overlooking similar precious opportunities. A well dressed, polite young man would canvas the average neighborhood in a week and get information that an experienced salesman could turn into cash.

Can there be any better way to get first hand information? Why not try prospecting among the "Acres of Diamonds" that lie at your door?

CHECKS FOR GARAGE TRANSIENTS.

Hyslop Bros. of Toronto, whose up-to-date methods previously have been remarked by Motor World, give transients checks for their cars when they are left over night. Thus, when a tourist calls for his car in the morning, he simply passes the check over to the attendant; he does not have to look for the "man with the curly hair who was there last night," but won't be back till after dinner and then give the history of his case to someone else, as is the case in so many garages. If supplies have been ordered, everything has been attended to beforehand and a slip to present to the cashier is awaiting the tourist, unless he intends to stay for three or four days.

Methods Businesslike Throughout.

Incidentally, when you drive up to the King Edward Hotel and ask the head porter, "Where can I find a good garage?" he does not mince words but takes out a little book of blanks which are directed to Hyslop Bros. and signs it and sends you on your way. This is a real business-like method, and any idea that you may have that the porter is going to get a big, fat premium for sending you to the garage is dispelled when you enter Hyslop Bros.'s splendid building and witness an example of their excellent service.

KEEP MAILING LIST UP-TO-DATE.

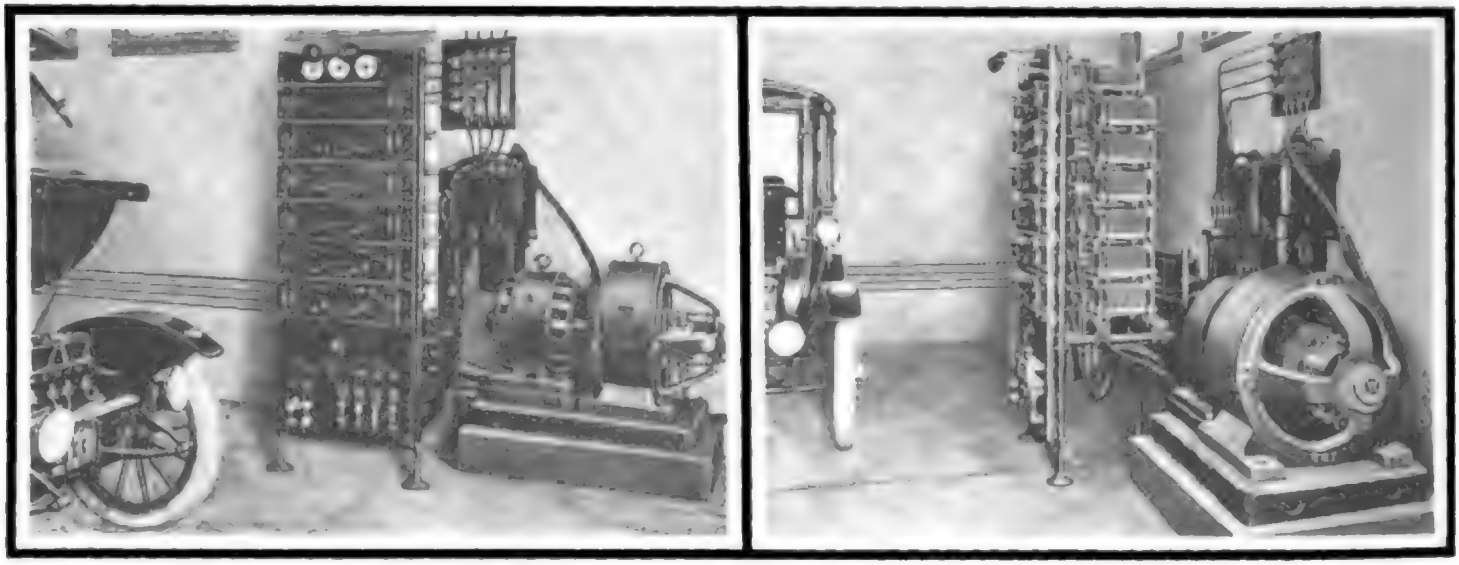
Mailing lists should be kept up-to-date. It is both expensive and foolish to have a behind-the-times mailing list. Your mailing list is your list of prospective customers. Addresses should be absolutely correct, surnames correctly spelled and initials correct. Nobody likes to get mail with the name half wrong. Even if it is only a circular, it seems like carelessness or lack of interest on the part of the sender. Every change should be noted at once. Every employe in the office should be impresesd with the fact that you regard that list as wonderfully important. Then everyone will be keen to note and record changes of any kind. Look to your mailing list and keep it right.

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APPLIES BOOKCASE IDEA TO CHARGING APPARATUS

Westinghouse Evolves an Ingenious and Practical Expansible System —One Set of Meters for All Batteries.

Apparently it is a far cry from a modern sectional bookcase to a charging equipment for electric vehicle batteries; but the likeness is striking in the case of a system that just has been placed on the market by the Westinghouse Electric & Mfg. Co., of East Pittsburgh, Pa., and which is well shown in the accompanying illustrations.



FRONT AND SIDE VIEWS OF WESTINGHOUSE "SECTIONAL" CHARGING PANEL AND GENERATING SET

A conspicuous advantage of this charging board is that a start can be made by installing equipment for charging as small a number of batteries as may be desired, and increases can be made from time to time, as conditions may demand, just as a sectional bookcase can be built up. That is to say, there is a top section of the charging board containing meters, lamps, switches and connections for charging two vehicles simultaneously. Additional sections, when required, are placed under the first, just as additional bookcase sections are placed under the cap-section. Additional sections, however, include only rheostats, switches and connections, the meters in the top section serving for all additions, being switched from one to another as occasion demands. The bottom section is similar to the top one in that it must be used even if there is only one charging pair, but is sufficient to handle the work entailed by the building up of the board to any reasonable height.

The outfit shown in the accompanying illustrations is sufficient to handle the charging of twelve batteries simultaneously, there being six sections and the top and bottom panels. If a board is built up as high as is desired, or as high as is possible, another may be built beside it and raised to the same height by using blank sections, to be replaced by active sections when they are needed. The two machines illustrated constitute a motor-generator set —that is to say, there is a motor driven by outside current and operating a generator which delivers current of the desired voltage; this is, of course, necessary only when the outside current supply is alternating, only direct current being available for battery charging. If the outside current supply is suitable, it may be connected direct to the charging board. If there is no outside supply of current, the electric motor can be replaced by any prime mover—gas, gasolene or steam engine.

And Now Here's the "Dogfish" Body.

What with "streamline" bodies, "submarine" bodies, "terraplane" bodies and too many others to mention, foreign builders must be just a little bit hard put to it to find expressive names for their creations, though little of the difficulty is apparent in the efforts of one French designer who has adopted the somewhat unenlightening designation "dogfish" body as best fitting his newest style. It is carefully explained, however, that the design has not been evolved to "make one more funny looking car; it would be one too many!" Instead, it is stated that the design is a logical development of the demand for the complete housing of everything possible. The body itself is of the orthodox pattern, except that the sides are carried clear out to the running boards, which thus are enclosed; the vertical space above the running boards is utilized to house the tool and battery boxes, trunks, etc., that go to make up part of the equipment. Two spare wheels can be accommodated in a bulbous back and the top when folded disappears completely in a pocket intended for the purpose. Washing the car, it is pointed out, is a comparatively simple matter, which would seem to be one of the principal advantages of the construction.

Price of "Gas" Low in West.

While on January 1st last the price of gasolene in the East was advanced one cent per gallon, and rumors are rife that it shortly may go from 17 to 19 cents, the price has been reduced 2½ cents per gallon on the Pacific Coast, where it is expected it soon will drop to 15 cents per gallon, retail. In that part of the country, it is stated that the area of what is termed "false valuation" is about past, as it has become known that the big oil companies for months have had an over-supply, due to the quality of oil which has been struck in the California fields, and also to competition of the Shell interests, who are importing gasolene from Sumatra. Previously, it was stated that the California oil was too heavy to produce gasolene, but discoveries in the Lost Hills, Belridge and Ventura districts have so changed the situation that the old excuses no longer rightfully can be brought to bear.

Removing Valve Cap with a Nut.

A valve cap of the type in which the wrench fits into a depression often may be removed, in the absence of a special wrench, by putting a nut, of the proper size and shape, into the depression, leaving enough projecting to afford a hold for an ordinary wrench. The nut need not be an exact fit, though it should be large enough so that there will be no danger of its turning and cutting away the faces in the valve cap.

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REILLY FAMILY OFFENDED BY A CREDIT MAN

Which Causes Reilly to Deliver Himself of Opinions on Credit Systems That Drive Away Trade—The Sales Manager Also Cites an Unpleasant Experience and Contrasts It With Department Store Methods.

"Trying out a different make of tires?" asked the Sales Manager, as a motor de-



"IT IS BETTER THAN SOME PEOPLE'S CASH," RESPONDED REILLY

livery wagon stopped in front of the Reilly salesrooms and the driver rolled a set within doors, the mark upon the tires and the same upon the delivery wagon showing only too plainly that the shoes were not of the same brand as those which had carried Reilly's cars for a number of years.

"Not 'trying out' but 'going to use' sums up the situation," asserted Reilly with emphasis.

"What's the matter with the other brand? Didn't they give satisfaction?" queried the Sales Manager.

"Nothing whatever the matter with the tires; the matter's with me, I guess," replied the dealer.

Reilly Confesses to a Grievance.

"Well," added the Sales Manager, "what's the matter with you, over and above the half hundred things that always ail you? I suppose you're sore about something."

"You're right; I am sore," admitted Reilly.

"I know it," exulted the Sales Manager. "I'm getting so I can read you like a book. Now that you've partially confessed, come out with the rest of it. What's it all about?"

"Oh, I got sore because Mrs. Reilly got sore," blurted out the impulsive little man; "she didn't get just the right treatment from the tire house where we used to trade, so we quit them."

"What did they do?"

"Nothing much," said Reilly, "except that they almost insulted her the other day when she wanted to buy a tire. We had been driving our car on shoes which were getting pretty bad and, while she was out one day, one of the shoes blew out, so rather than run up here on the rim she drove to this tire company's branch, which was near where the blow-out occurred, and told them she wanted a new shoe.

When an Ironclad Rule Offended.

"The peculiar part of it is that I had bought a great many shoes there, but had always paid cash. I don't know why I did it, for I generally do more or less credit business as a matter of principle. Well, Mrs. Reilly and our chauffeur went in after the shoe, and the clerk who shoved it across the counter to the driver said, 'Thirty-four fifty.' Mrs. Reilly looked in her purse but didn't happen to have that amount of money with her, so she presented her card and showed the clerk one of mine and asked if the matter couldn't be taken up with me.

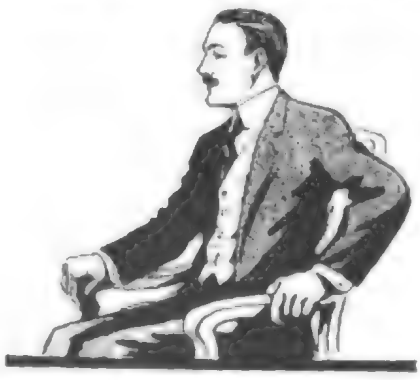
"The clerk said that the house rule was not to do a retail credit business. She said this might well come under the wholesale end, and practically insisted that it be charged to me as a dealer. The clerk meandered over to the bookkeeper and, of course, an investigation disclosed the fact that the company had never given me any credit. Then there was a conference with some sort of a credit man somewhere about the building, and the upshot of it was that they refused to let her have the tire. They explained that if President Taft or Napoleon Bonaparte or anyone else came along he couldn't be trusted for a tire, simply because it was an inflexible house rule."

"What did she do?" asked the Sales Manager.

Tactless Credit Work Loses Trade.

"What did she do?" exclaimed Reilly. "What could she do? She got red in the face and flounced out of that store in a hurry and drove up here on the flat tire and got one from my stock. And, believe me, her treatment made me as mad as she was—maybe madder. I called up the tire branch and asked them when my credit had grown so bad that it wasn't good for one tire. The salesman or manager or whoever I talked with tried to be as affable as he knew how; he explained that Mrs. Reilly was not known to them and that they never sold tires at retail on anything but a cash basis.

"I asked him if he didn't know I had



"MY CREDIT MUST BE AWFUL GOOD," SUGGESTED THE SALES MANAGER

bought several hundred dollars' worth of tires there since I had been in business and had paid cash with every order. He said he knew I had bought tires there. I asked then if he didn't think I was good for one tire on credit. He said he didn't know, that I never had been given credit by the branch, and that he couldn't very well charge that shoe. I asked him how long it would have taken him on the telephone to have found out whether Mrs. Reilly was Mrs. Reilly and whether I was good or not, and he hemmed and hawed and was still hemming and hawing when I hung up the receiver. For all I know, he's hemming and hawing yet.

Trying to Repair Needless Damage.

"One of their salesmen came in to see me several days afterward and tried to square the matter, but I wasn't in a mood that day to be squared; I told the salesman just how I felt and told him also that he was wasting time talking to me and that if his time was at all valuable he could utilize it elsewhere to better advantage."

"Some credit system in that branch, isn't it?" commented the factory man.

"That branch doesn't know what 'credit system' means," declared Reilly. "They use the term down there, but it's just like a parrot saying smart things; they are only using a term they have heard someone else use, but as to what it actually means in its full and valued sense they are in total ignorance. And the branch by no means has a monopoly on that class of ignorance."

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"So few business men or business houses realize the value of a proper credit system or a proper credit man; too many credit men, or alleged credit men, develop an attitude of superiority and arrogance toward the public and conduct themselves as if extending credit were a favor to a customer and one for which the latter should be so thankful that he ought to get down on his knees and express his gratitude, and above all, that if he is refused credit he should consider himself as having deserved the refusal. You know, Jim, that a man whose credit is good can't help feeling offended when his credit is questioned."

Questioned Sales Manager's Credit.

"You're quite right there, Reilly," replied the Sales Manager. "I, myself, hold a sort of grudge against a carburetter branch up in our town to this day. I've tried to shake it, but I don't believe I ever will be able to as long as the present branch manager stays on the job."

"What did he do to you?"

"I wanted a new nozzle for the carburetter of my own car one day," explained the factory man, "and I sent the car down to the branch with one of the factory chauffeurs and told him to get the nozzle, find out how much it was, and tell the branch I would send the money down as soon as I knew how much to send. The chauffeur came back and told me the manager said he didn't know me and had never heard of me. He said he explained to the branch manager who I was and that the money would come right along, and, in fact, would have been sent down had I known the price of the nozzle—but there was nothing doing.

"I did just as you did; I telephoned to the branch and expressed a few opinions and didn't get much satisfaction. I asked the manager if he didn't think I was good for a nozzle that didn't cost more than a dollar or so. He still insisted that he did not know me and did not know whether I really had sent the chauffeur. I asked him if he couldn't have called me up and found out whether I was good. Then he said he wasn't allowed to do a credit business. I asked him if he couldn't have carried the amount on a slip of paper for a few hours, and he said, 'Not according to our rules.'"

Fallacy of the Inflexible Rule.

"There is *no* rule that is inflexible," asserted the dealer. "Cash business is all right, but exceptions must always be made. The biggest cash concerns in the country will carry an account for a day or two if they see the wisdom of it. Oftentimes a man whose credit is beyond question, as in your case, needs something badly and can't pay at once very conveniently, and in that case any sensible man will carry the charge on memorandum because it is practically a cash transaction and means the saving of a sale and the fostering of good will.

Making Full Use of the Telephone.

"Where is a cash house to draw the line? That's a matter of judgment, and, of course, it's a difficult one at times, but it ought not to trouble a thinking man. Every business man knows whom he can trust, and if he doesn't know, it won't take long to find out. The handiness of telephones makes excuses for not finding out unreasonable. If a man comes into a store nad wants credit and he is not known he is perfectly willing to wait until the credit man can call up whatever references the customer gives. And if the customer is fortified with letters and cards there is seldom a chance of going wrong."

"But supposing a credit man should be buncoed?" suggested the Sales Manager.

"He has to take a chance, that's all," answered Reilly. "There isn't a merchant or business man of any kind who isn't always taking chances. A clever crook could get possession of letters and cards and give a reference which would be found good over the 'phone and get away with a small amount of goods, but the chance is so small that the wise credit man is willing to risk making a mistake if he is fairly sure he is right.

"Also, tact is a quality which many credit men are sadly in need of. That carburetter man who turned you down could just as well have explained to the chauffeur that he didn't do a credit business, instead of telling the chauffeur he questioned your credit. He probably was one of these exalted financiers who never got into the domain of common sense because he couldn't get through the door, it is so small.

Advantage of Not Paying Cash.

"But the solution of the whole problem with me has resolved itself into a determination not to pay cash for anything where there is any possibility that I will ever need credit. You can pay cash all your life and buy thousands of dollars worth of goods, and maybe when you happen to want credit for a few days you are turned down, for the simple reason that you never have had credit. I buy practically everything on credit now, but I discount my bills, and that tells the story. My wife used to have a holy horror of bills and didn't want to run accounts at the stores, but I insisted upon it. Until we started accounts we didn't have any credit, although our credit really was as good then as it is now. In fact, I never thoroughly realized what it meant until I heard a pretty shrewd business man remark that a customer who always pays spot cash is never fully appreciated—that a firm never knows a customer nor realizes the volume or value of his patronage unless it appears in black and white on the firm's books and is totaled at the end of the year. He said he himself never paid cash for his purchases, for that reason and for no other."

"My credit must be awful good, if the letters I get from department stores are any criterion," remarked the Sales Manager. "I get a grist of them inviting me to open accounts or telling me that an account has been opened for me without my asking for it."

Department Stores as a Pattern.

"They surely are a criterion," stated Reilly, "and also are an evidence of wide-awake credit methods in the modern department stores. The stores have looked you up thoroughly and they know you're good. They also have discovered that you have no account with them. They also know that you are quite likely to trade where you have an account, and the answer is simple—they are trying to get your name on their books. Your credit to them is better than some people's cash.

"Those credit men, too, have gotten over that old-time idea that credit is something to be fought shy of. The efficient, up-to-date merchant discriminates; he shakes off the bad credits and works like a nailer to get the good ones. He also reverses the situation and makes you think he is the one who is favored if you open an account. And tact! These darned department store credit men are so tactful that you feel like falling over yourself to pay your bills."

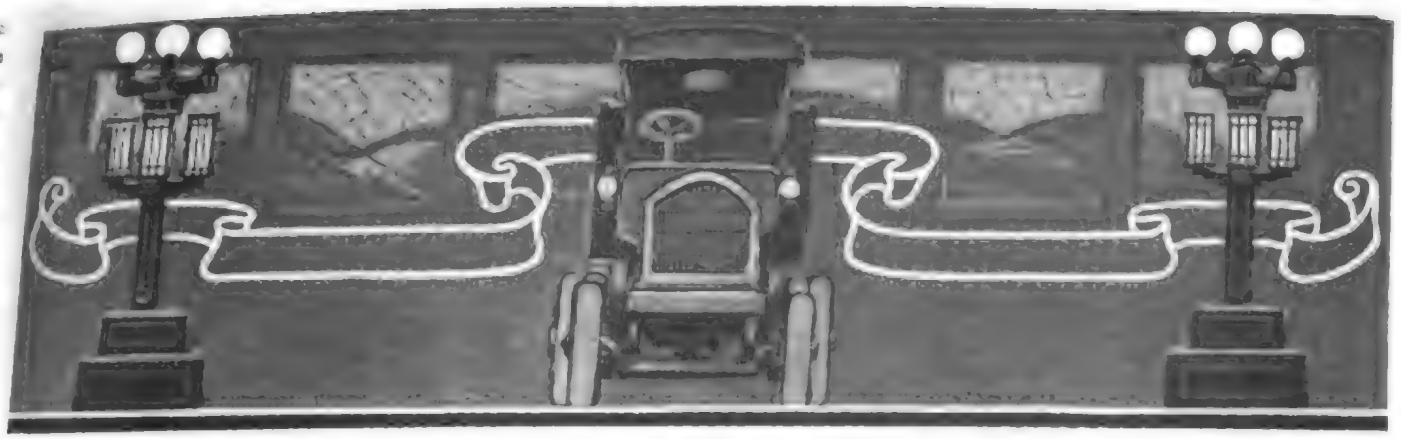
The telephone rang, and after the Sales Manager had listened to a one-sided conversation Reilly explained that it was the branch from which the tires had just come asking if everything was all right.

"I told him to send a bill and I'd send a check," added Reilly, "but he didn't seem worried about it. He said he guessed I was good, and you can bet your hat that while he said he 'guessed' his guess is based upon an investigation. That chap knows his business."

When Hunting is Doubtful Sport.

Opinions differ as to what constitutes sport; according to various viewpoints it may be anything from hunting tigers on foot to racing snails on a shingle. There are not many, however, who will class the latest amusement of a Western car owner as sport. His plan is to sit on a saddle placed on the hood of a car, armed with a gun, and be driven along the road on a dark night with the headlights burning full force. Rabbits, blinded by the glare, stand still in the road until the "sportsman" gets near enough to pot them.

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THE TRUCKS IN THE "STAINED GLASS" SETTING

Surprises That Were Expected and Some That Were Not—Chicago-Built Machines Not Shown in New York Form Strong Contingent—Standard Construction Embodied in Most of the Trucks Displayed.

Whether that dear Coliseum really is much like a Cathedral or not—or ever could be made to look much like anything except its steel-boned self—is entirely immaterial. The fact remains that this here, now, S. Miles, what gets up these automobile shows, y'understand, has worked out something that a name can be tacked onto, and however loosely the appellation may fit, it is a whole lot better than describing it as something indescribable and letting it go at that. Now, last time there was an automobile show in Chicago—but what's the use.

Same Setting Remains for Trucks.

It's enough to say that the host of trucks basks under the same "stained glass effects" as did the pleasure cars; the same nude and, therefore—if for no other reason—highly artistic figures gaze down on the machines; the same centaur wonders—or ought to—what the dickens he is doing there and fails to discern anything familiar to his classic eye except the name on the Mercury and Vulcan trucks; and over all there is the same dim, religious light. That is to say, that's what it looks like. According to the expert testimony of the photographers, the light is emphatically not religious, however dim it may be.

The Chicago truck show has confirmed the growing suspicion that it isn't really necessary to swing wide the portals—that's one that hasn't been overworked—upon an incomplete exhibition. All the machines were in place, and all looked as if they had had plenty of time to get there. Thankfully, the first-night crowd observed that there was plenty of elbow-room, even as there was at the truck show in New York. In the accessories departments there was more than elbow-room, for there were many exhibitors of the many things that go to make and equip a complete car who decamped, leaving behind them emptiness. In other words, the accessories exhibits were thinned out nearly half. Of course, this is rather to be expected, for there are hosts of things that the pleasure car people must have, or ought to have, or think they ought to have, that the truck people can very well get along without.

The business of prognostication is one of the most disconcerting that exists, in some ways. For instance, according to all the preliminary dope, there ought to have been just an even score of cars shown at Chicago that were not shown in New York. Come to look over the show itself and, behold! there are three too many, despite the fact that two of the original score failed to stand up when their names were called—the Reliance and the Ware. But five others—namely, Harvey, Hercules, Moon, Moore and Sampson—put in a more or less unexpected appearance and a good deal more than evened the score, so to speak. The Sampson, of course, is an old and sturdy friend, and its solidity and strength are, as they always have been, in keeping with its name.

New Truck With Two-Cycle Motor.

The Moore is a new machine of 1,600 pounds carrying capacity manufactured by the Palmer-Moore Co., of Syracuse, N. Y., and its chief feature of interest is its motor. This is the Palmer-Moore two-cycle, described in Motor World when it first appeared nearly a year ago, in which it is sought to combine the slow-running qualities of a motor with small ports with the speed and power of a large-ported motor. There are shutters in the intake and exhaust ports which are under the control of the driver; the motor is throttled by partly closing the shutters and speeded up by opening them, the speed regulation thus being removed from the carburetter altogether. The motor has three air-cooled cylinders of 4 inches bore and 4 inches stroke and is rated at 20 horsepower. Apart from the motor, the truck is built along familiar lines, having a two-speed planetary gearset and side chain drive to the rear wheels. The wheelbase is 102 inches and the wheels, which are 36 inches in diameter, are fitted with solid tires.

Moon and Harvey Enter the Field.

The name Moon is well enough known in connection with pleasure cars, but this is the first time the Moon people have exhibited a truck; there's a new Moon just rising, so to speak. The machine is anything but radical; it follows accepted lines, having a four-cylinder L-head motor driving through a three-speed selectively controlled gearset to the live rear axle. The rated carrying capacity is a ton and a half. A standard body of the express type, with canopy top, is mounted.

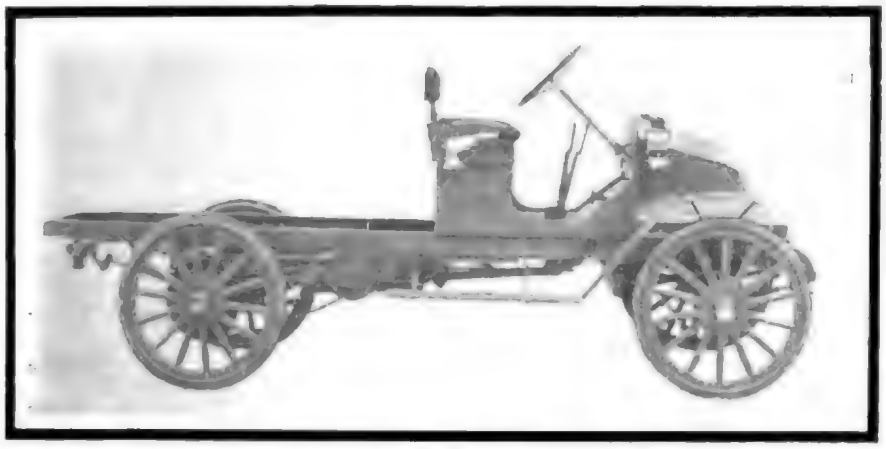
Another debutante—if the name doesn't fit, don't use it—is the Harvey, built by the Harvey Motor Truck Works and hailing from Harvey, Ill. Like the Moon, the Harvey truck is made in a single size, of a ton and a half capacity, and the same description applies, in a general way, as far as the rear end of the gearcase—that is, there is a

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GENERAL VIEW OF THAT PORTION OF CHICAGO'S TRUCK SHOW WHICH IS HOUSED IN THE COLISEUM

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four-cylinder L-head motor and three-speed selectively controlled gearset; but in the Harvey final drive is by side chains. Only a chassis is exhibited. While not a few manufacturers of heavy trucks have adopted cast steel wheels, their advantages for lighter machines have not been so readily discerned; the Harvey people, however, have cast their vote boldly for the die-



PALMER-MOORE CHASSIS WHICH EMPLOYS 3-CYLINDER 2-CYCLE MOTOR

cast steel wheels they fit to their trucks, and claim for them all the advantages possessed by wood wheels and, in addition, strength in those points in which the wood wheel is comparatively weak.

Eight "Built In Chicago" Vehicles.

Chicago-built trucks loom up strongly among the "Chicago exclusively" exhibits—or, rather, the exhibits shown in Chicago but not in New York. No less than eight cars claim Chicago as their native soil and seem none the worse for it—Clark, Diamond T, Harder, Little Giant, Mogul, Old Reliable, Walker, and Mercury. So far as size is concerned, the Mogul is the most conspicuous of the group; there are shown two great six-tonners which differ only in the matter of wheelbase. The constructional details show nothing unusual; standard features are employed throughout. The motor, of the T-head type, and the three-speed selective gearset are substantial and well adapted to their work, but without departure from current practice. Final drive is by side chains. The longer chassis is fitted with a special lumber body, a feature of which is the crank-operated roller system, by which one man can unload the whole cargo. The tires, however, are even more unusual than the body, in their own way. They consist of rubber cushions, which, as usual, absorb jar and vibration, and a series of steel blocks, forming a tread which resists wear by reason of its hardness and has many sharp edges which, should there be a tendency to skid, grip the road and hold the truck in line.

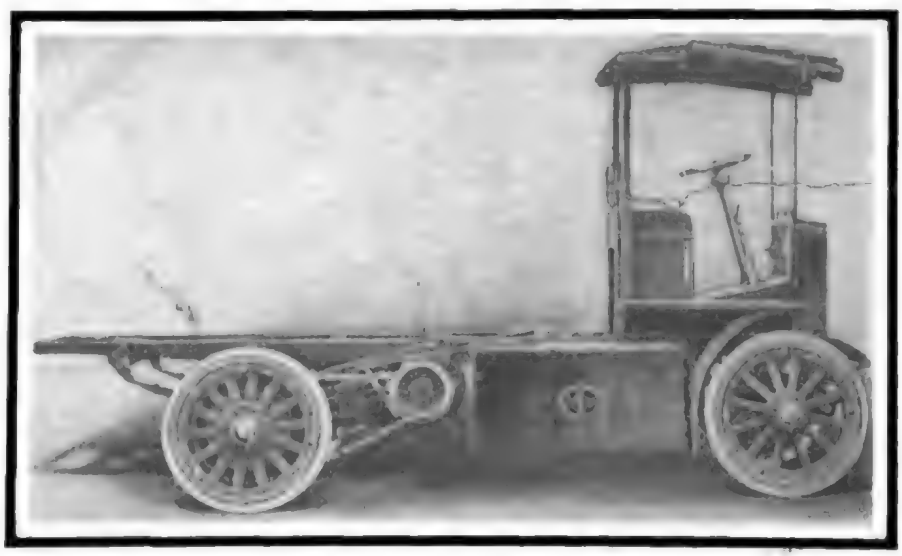
Walker trucks, which are electrics with internal gear drive enclosed in the rear wheels, while the motor is encased in the hollow rear axle, are distinctive because of their peculiarities as well as their faculty of standing up and doing their work; like most machines of unusual construction, they are no strangers to showgoers. Suffice it to say that they have not been altered, except in minor details.

While worm drive is not the novelty it was a short time ago, it still is new enough to call special attention to any machine in which it is employed, and for this reason, if for no other, the Diamond T is conspicuous; not that this is its only claim to distinction, for it is not; it is, however, the one that stands out most from the multitude. The worm has been applied to a machine having a carrying capacity of 1½ tons, which is exhibited, and also to a 3-ton model, which is not at the show. The 1½-ton worm driven car has a block-cast motor with fixed ignition point and enclosed valve mechanism. The three-speed gearset is a unit with the motor and is selectively controlled by a center lever; the steering wheel, however, is on the right side. A five-ton truck also is shown, having its motor and gearset in separate units and final drive by side chains.

Examples of "Driver Proof" Construction.

The mechanical shortcomings of the men who usually are selected to drive delivery wagons have been given their full meed of consideration in the working out of the Clark delivery cars. For instance, the block-cast motors have ignition by automatically advanced Eisemann magneto, and the gearsets are of the individual clutch type; the gears always are in mesh, and there is no chance for the driver to strip them bare of teeth. Final drive is by shaft in all cases. Motor position varies in different models, being under the seat in some and under the usual forward hood in others; the two cylinder horizontal motor that was employed in previous models has been discontinued.

The Chicago Pneumatic Tool Co. has added two members to its family of Little Giants. One is brand new, having a four-cylinder motor and three-speed selective gearset, in which it differs from others of the tribe, which have horizontal motors of the two-cylinder opposed type. One of the two-cylinder models has a planetary gearset and another a sliding gear similar to that on the four-cylinder car. The control is of the interlocking type, so that the clutch must be disengaged before the gears can be shifted—another case where the mechanical shortcomings of otherwise perfectly good delivery wagon drivers have been considered to some purpose.



SIDE VIEW OF THE URBAN ELECTRIC TRUCK CHASSIS

"One of those little fellows with the high wheels" just about places the Mercury—one of those busy, useful, simple, all-round wagons that find such favor for light delivery work. But a single model is built—a

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light delivery with horizontal opposed cylinder motor, air-cooled, placed crosswise under the body. With this power plant, a planetary transmission and side chain drive, combined with light weight, the machine is well able to take care of itself under conditions that make things mighty hard for some of the heaviest trucks.

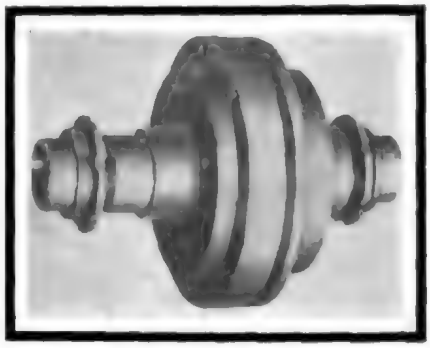
Once again—standard construction; this time it is the Harder truck, which is shown in two models—3-ton and 5-ton—both with four-cylinder T-head motors, three-speed selective gearsets and final drive by good, stout side chains. The under-the-seat position has been adopted for the power plant, owing to the fact that the chassis length can be kept down without encroaching upon the space required for loading purposes. Whether through hard luck or Harder luck, a fine piece of fire department apparatus that was intended for the show was delayed in the shops and so could not be exhibited; but while the exhibit was deprived of a spectacular feature, the machines that were there appeared to be fully able to stand on their own merits.

Drives Through All Four Wheels.

All ideas of standard construction are thrown to the winds in the case of the Four-Wheel Drive truck, which is shown for the first time—that is to say, there is nothing standard in the general design of the machine, and few of the component parts are of familiar type. The machine is just what its name indicates; both axles are driven through shafts and bevel gears. The motor, of the T-head type, drives in the usual way to a gearset, in which the gears always are in mesh, the different speeds being engaged by means of individual friction clutches. From the final shaft of the gearset the drive is through a "silent" chain, enclosed in a tight casing, to a differential on a longitudinal shaft the opposite ends of which carry the bevel pinions driving to the live front and rear axles. Specially constructed universal points on the live shafts of the front axle permit steering and driving simultaneously, the rear wheels not being employed in steering.

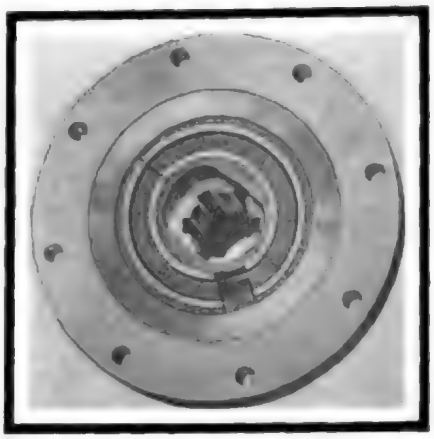
These trucks are built in two capacities—1,500 pounds and 3 tons—the constructional features being alike in both, though the heavier car has a differential lock on the master differential—the one on the longitudinal shaft—which gives a rigid drive to both axles. The service brakes are a pair of bands and drums on the master differential, there being one on each side, accurately equalized, while a pair of drums and bands on the rear wheels constitute the emergency brake equipment. A feature that is in keeping with the four-wheel drive idea is that the weight distribution is very even, there being only 10 per cent more weight on the rear wheels than is carried on the front.

A bold departure from commonly accepted practice, in a constructional detail, is found in the Wayne gearless differential in the rear axle of the Ideal truck. In the casing usually occupied by the gears of the conventional differential is a pair of friction clutches actuated by cams. The effect



IDEAL GEARLESS DIFFERENTIAL.

of the driving power is to throw the cams slightly and expand and engage the friction clutches; if, however, one wheel moves faster than the other, as does the outer wheel on a curve, the clutch of the faster moving wheel shaft will become disengaged, allowing the wheel to run free while the slower moving wheel takes the drive. As



IDEAL DIFFERENTIAL MECHANISM

long as both move together the driving power is equally distributed.

Advantages of Gearless Differential.

Several interesting advantages accrue from this arrangement. It is not possible to spin one wheel while the other stands, for if both wheels cannot drive, the slowest moving wheel must take the drive; thus, a wheel with a deflated tire will revolve a little faster than its mate with a full tire, and can take no driving strain; the driving action on a slippery road is the same as if there was a differential lock and an ordinary differential; a car can be driven with a live axle shaft removed; and so on.

But the Ideal cars have other things besides Wayne differentials. There are two models, of 1 ton and 2 tons capacity, respectively, with four-cylinder, L-head motors, three-speed selective gearsets and final drive by side chains, the differentials being of course on the jackshafts.

A very close approximation to a straight-line drive is obtained in the case of the Poyer company's Menominee trucks by the use of a peculiar drive from the gearset to the propeller shaft. Instead of driving direct from the tailshaft of the gearset to the propeller shaft, there is a pinion on the tailshaft which drives a gear located directly under it, and the shaft that carries the gear drives the propeller shaft. The net result is that the propeller shaft starts from a position several inches lower than the tailshaft, and yet the motor, which is built as a unit with the gearset, can be carried plenty high enough to give accessibility.

Preaching and Practicing Long Stroke.

The doctrine of long stroke for commercial work is one that is believed, preached and practiced by the manufacturers of the Nateo truck, for they equip their machine with a motor having a bore of 3½ inches and a stroke of 5 inches, rating at 27 horsepower. Up-to-date practice is embodied in the engine, which has block-cast cylinders, enclosed valve mechanism and the intake pipe arranged to pass through the opening that is left between the second and third cylinders below the water jackets; this arrangement has the advantage of warming the gas and facilitating vaporization. The motor is cooled by gravity-circulated water.

A practice that is growing in favor is adopted in the Nateo; that is, the motor is placed under the footboards with the cylinders projecting upward into a low hood which divides the floor into two parts. The radiator is in the place usually occupied by the dashboard. Transmission of power is through a leather-faced cone clutch, three-speed selective gearset and side chains to the rear wheels. But one model is built, the carrying capacity being one ton.

One of the surprises of the show is the variety of machines exhibited by the Avery people, whose farm tractor is a well-known machine in agricultural districts. No less than four new models are shown, and while two of them, the 3-ton and 5-ton trucks, were made public in January, a 1-ton machine built along European lines and a two-tonner with motor under the seat and floor are just out of the box. Both machines have four-cylinder block-cast motors, three-speed selectively controlled gearsets and side chain final drive, and are equipped with left steer and center control; in fact, apart from motor position and such matters as size and weight, the machines are practically alike.

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The 3-ton and 5-ton models have motors under the seats; the three-tonner has the same individual-cylinder motor as the tractor, while the five-tonner has a new motor with pair-cast cylinders and exhaust valves in the cylinder heads and intakes in side pockets. The 2-ton farm tractor has been discontinued, and the 3-ton tractor, which is retained, has 40- and 42-inch wheels with wood plug tires.

Motors That Are Accessible.

A type of truck that is gaining in popularity because of its obvious advantages in the way of accessibility and simplicity is that in which the engine is placed under a sloping hood with the radiator behind it—originally a French design. To this class belongs the Adams, which is represented by a 1-ton and a 2-ton machine, a 3,000-pound model being absent. The motors in all the Adams models have four cylinders and drive through selectively controlled gearsets; left steer and center control are standard.

The Adams block-cast motor is a particularly interesting piece of engineering, owing to the fact that the oil pump, water pump and magneto all are driven from a worm-driven transverse shaft at the front of the crankcase. The open-front design permits easy access to this group. The motor is of the moderately long-stroke type, the bore being 3⅜ inches and the stroke 5 inches.

Also left-steered and center-controlled, the United States trucks add individuality by the use of gearsets of individual clutch type, these being characteristic features of both the two-ton and the three-ton models shown. The motors have L-heads and enclosed valve systems and are carried in front, under hoods; final drive is by countershaft and side chains.

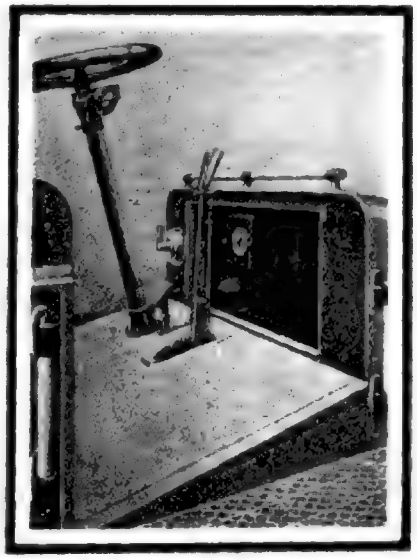
Friction Drive and Electricity.

Proof positive that the friction drive principle will not down—in fact, its adherents say that its specialty is going up—is furnished by the little 1,000-pound Commerce wagon and a slightly heavier model designed to carry 1,250 pounds. The two models are much alike, having four-cylinder motors, no clutches, of course, and final drive through side chains. The heavier machine has a somewhat more powerful motor than the lighter.

Though built according to standard ideas in almost every other respect, one of the Old Reliable trucks has a touch of individuality in its braking system. On the 4-ton model the countershaft brake is the Kline, in which the brake is actuated through an eccentric instead of the more usual toggles. The theory is that the pull of the brake is not felt by the operator, who finds it just as easy to hold the brake "on" as to apply it in the first place. Two Old Reliables are shown—a 2-ton and a 4-ton.

Menominee trucks are exhibited in three models having carrying capacities of 1,500 pounds, 1 ton and 1½ tons, respectively. Motors are under a forward hood. The steering wheels are placed on the right side and the gear-shifting and emergency brake levers are in the center of the footboard.

There are two "exclusive" electrics in addition to the Walker balance drive machine—the Buffalo electric and the Urban. These two machines are excellent examples of two different power transmission systems. The Buffalo employs a heavy-duty slow-speed motor which drives direct to the live rear axle through propeller shaft, which is innocent of universal joints, and bevel gears; the shaft is practically horizontal when the truck is under load, and in this condition the weight of the motor is all taken by the hangers. In the case of the Urban—the product of the Kentucky Wagon Co., of Louisville, Ky.—the motor shaft carries a sprocket over which runs a "silent" chain driving a countershaft which, in turn, drives to the rear wheels through sprockets and roller chains.



URBAN ELECTRIC CONTROL ELEMENTS

Controller and emergency brake levers on the Urban electric are similar to the levers of a gasolene car and are centrally located, as in many gas machines; in fact, the battery is about the only thing that betrays the electric propelling power when the car is viewed from a little distance.

The Buffalo electrics are built to carry 1,500 pounds. The Urban line includes machines carrying 1,000 pounds, 1 ton, 1½ tons and 2 tons, only the largest and smallest being exhibited.

As for the rest of the trucks shown at Chicago, they all were shown in New York and have been fully covered in Motor World and, while they have lost nothing in being tranpsorted from New York to Chicago, they have acquired no new features that cannot be accounted for by the flicker of the "cathedral lights."

The full list of truck exhibitors is as follows, the asterisk (*) denoting exhibitors who were not at New York.

Adams Bros., Findlay, Ohio—Adams. Gasolene, 1 and 1½ tons; prices, $2,100 and $2,300.*

American Locomotive Co., New York—Alco. Gasolene, 2 to 6½ tons; prices, $2,950 to $5,200.

Autocar Co., Ardmore, Pa.—Autocar. Gasolene, 3,000 pounds; price, $2,150.

Avery Co., Peoria, Ill.—Avery. Gasolene, 2, 3 and 5 tons; prices, $2,700 to $4,500.*

Baker Motor Vehicle Co., Cleveland, Ohio—Baker. Electric, 500 pounds to 4 tons; prices, $1,800 to $3,500.

Bessemer Motor Truck Co., Grove City, Pa.—Bessemer. Gasolene, 1,000 to 3,000 pounds; prices, $1,200 to $2,700.

Blair Mfg. Co., Newark, N. J.—Blair. Gasolene, 1½ to 3½ tons; prices, $3,000 to $3,750.

Bowling Green Motor Car Co., Bowling Green, Ohio—Modern. Gasolene, 1,000 to 2,000 pounds; prices, $1,200 to $1,600.

Brown Commercial Car Co., Peru, Ind.—Brown. Gasolene, 500 pounds; price, $1,650.

Buick Motor Co., Flint, Mich.—Buick gasolene, 1,000 pounds capacity; price range, $975 to $1,100.

Buffalo Electric Vehicle Co., Buffalo, N. Y.—Buffalo Electric.*

Chase Motor Truck Co., Syracuse, N. Y.—Chase. Gasolene, 500 pounds to 2 tons; prices, $500 to $2,200.

Clark Delivery Car Co., Chicago, Ill.—Clark. Gasolene, 1 ton; price, $2,000.*

Chicago Pneumatic Tool Co., Chicago, Ill.—Little Giant. Gasolene, 1 ton; price, $1,100.*

Commerce Motor Car Co., Detroit, Mich.—Commerce. Gasolene, 1,000 pounds; price, $700.*

Dart Mfg. Co., Waterloo, Ia.—Dart. Gasolene, 750 to 3,000 pounds; prices, $750 to $1,790.

Diamond T Motor Car Co., Chicago, Ill.—Diamond T. Gasolene, 1½, 3 and 5 tons; prices, from $2,250 to $3,500.*

Dayton Auto Truck Co., Dayton, Ohio—Dayton. Gasolene, 2, 3 and 5 tons; prices, $2,600 to $4,500.*

Driggs-Seabury Ordnance Corp., Sharon, Pa.—Vulcan. Gasolene, 4½ to 7 tons capacity; price range, $3,600 to $5,600.

Durant Dort Carriage Co., Flint, Mich.—Flint. Gasolene, 1,000 and 1,600 pounds; price of 1,000 pound, $875.

Federal Motor Truck Co., Detroit, Mich.—Federal. Gasolene, 1 ton; price, $1,800.

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Four Wheel Drive Auto Co., Clintonville, Wis.—Four Wheel Drive. Gasolene.*

Garford Co., Elyria, Ohio—Garford. Gasolene, 1½ to 5 tons.

General Motors Truck Co., Pontiac, Mich.—G M C. Electric and gasolene, electric 1,000 pounds to 6 tons and gasolene 1¼ to 5 tons.

General Vehicle Co., Long Island City, N. Y.—General Vehicle. Electric, 750 pounds to 5 tons.

Gramm Motor Truck Co., Lima, Ohio—Gramm. Gasolene. Willys, gasolene; capacity, 1,500 pounds; price, $1,250.

Gramm-Bernstein Co., Lima, Ohio—B. A. Gramm. Gasolene, 2 to 3½ tons; prices, $2,750 to $3,600.

Harder Auto Truck Co., Chicago, Ill.—Harder. Gasolene.*

Harwood-Barley Mfg. Co., Marion, Ind.—Indiana. Gasolene, 1½ tons; price, $2,000.*

Harvey Motor Truck Works, Harvey, Ill.—Harvey. Gasolene, 1½ tons capacity.

Hewitt Motor Co., New York—Hewitt. Gasolene, 1 to 10 tons; prices, $1,800 to $5,500

Hupp Motor Car Co., Detroit, Mich.—Hupmobile. Gasolene, 800 pounds; price, $950.

Ideal Automobile Co., Ft. Wayne, Ind.—Ideal. Gasolene, ¾, 1, 1½ and 2 tons; prices from $1,500 to $2,250.

International Harvester Co., Chicago, Ill.—I. H. C. Gasolene, 1,000 pounds.

Jeffery Co., Thos. B., Kenosha, Wis.—Rambler. Gasolene.*

Kelly Motor Truck Co., Springfield, Ohio—Kelly-Springfield. Gasolene, 1 to 3 tons; prices, $2,000 and up.

Kentucky Wagon Mfg. Co., Louisville, Ky.—Urban. Electric, 1,000 pounds; price, $1,800.*

Kissel Motor Car Co., Hartford, Wis.—Kissel. Gasolene, 1,500 pounds to 5 tons; prices, $1,500 to $4,350.

Knox Automobile Co., Springfield, Mass.—Knox. Gasolene, 2 to 6 tons; prices, $2,750 to $5,000.

Koehler S. G. Co., H. J., New York—Koehler. Gasolene, 1,600 pounds; price, $750.

Krebs Commercial Car Co., Clyde, Ohio—Krebs. Gasolene, 1,500 pounds; price, $1,375.

Lauth-Juergens Motor Car Co., Fremont, Ohio—Lauth-Juergens. Gasolene, 1 to 3 tons; prices, $1,950 to $3,300.

Lippard-Stewart Motor Car Co., Buffalo, N. Y.—Lippard-Stewart. Gasolene, 1,500 pounds; price, $1,650.

Locomobile Co. of America, Bridgeport, Conn.—Locomobile. Gasolene, 5 tons; price, $4,800.

Lansden Co., Newark, N. J.—Lansden. Electric, 750 pounds to 5 tons.

Mack Bros. Motor Car Co., Allentown, Pa.—Mack. Gasolene, 1 to 7 tons; prices, $2,100 and up.

Mais Motor Truck Co., Indianapolis, Ind.—Mais. Gasolene, 1½ to 3 tons; prices, $2,750 to $3,400.

Maxwell Motor Co., Tarrytown, N. Y.—Sampson. Gasolene.

Mogul Motor Truck Co., Chicago, Ill.—Mogul. Gasolene, 2, 4 and 6 tons; prices, $2,800 to $4,700.*

Moon Motor Car Co., St. Louis, Mo.—Moon. Gasolene.

Mercury Mfg. Co., Chicago, Ill.—Mercury. Gasolene, 1,000 pounds; price, $750.*

National Motor Truck Co., Bay City, Mich.—Natco. Gasolene, 1 ton.*

Old Reliable Motor Truck Co., Chicago, Ill.—Old Reliable. Gasolene, 2, 4 and 5 tons; prices from $2,750 to $4,500.*

Packard Motor Car Co., Detroit, Mich.—Packard. Gasolene, 2 to 5 tons; prices, $2,800 to $4,500.

Palmer-Moore Co., Syracuse, N. Y.—Moore. Gasolene; 1,600 pounds capacity; price, $1,300.

Peerless Motor Car Co., Cleveland, Ohio—Peerless. Gasolene, 3 to 5 tons; prices, $3,700 to $4,500.

Poyer & Co., D. F., Menominee, Mich.—Menominee. Gasolene.*

Pierce-Arrow Motor Car Co., Buffalo, N. Y.—Pierce-Arrow. Gasolene, 5 tons; price, $4,500.

Pope Mfg. Co., Hartford, Conn.—Pope-Hartford. Gasolene, 3 to 5 tons; prices, $3,350 to $4,475.

Reliance Motor Truck Co., Pontiac, Mich.—Reliance. Gasolene.*

Reo Motor Car Co., Lansing, Mich.—Reo. Gasolene, 1,500 pounds to 2 tons; prices, $760 to $1,800.

Sanford Motor Truck Co., Syracuse, N. Y.—Sanford. Gasolene, 1 ton; price, $1,600.

Saurer Motor Co., New York—Saurer. Gasolene, 4½ to 6 tons.

Schacht Motor Car Co., Cincinnati, Ohio—Schacht. Gasolene, 1,500 pounds to 4 tons; prices, $1,600 to $3,300.

Selden Motor Vehicle Co., Rochester, N. Y.—Selden. Gasolene, 1 ton; price, $2,000.

Service Motor Car Co., Wabash, Ind.—Service. Gasolene, 1,500 pounds to 1½ tons; prices, $1,350 to $1,675.

Smith Co., A. O., Milwaukee, Wis.—Smith-Milwaukee. Gasolene, 3½ to 6 tons.

Speedwell Motor Car Co., Dayton, Ohio—Speedwell. Gasolene, 2 to 6 tons; prices, $3,750 to $4,400.

Standard Motor Truck Co., Detroit, Mich.—Standard. Gasolene, 3 tons; price, $2,750.

Sternberg Mfg. Co., Milwaukee, Wis.—Sternberg. Gasolene, 2 to 5 tons; prices, $2,800 to $4,500.

Stewart Motor Corp., Buffalo, N. Y.—Stewart. Gasolene, 1,500 pounds; price, $1,650.

Studebaker Corp., Detroit, Mich.—Studebaker. Electric and gasolene; electric, 500 pounds to 5 tons; gasolene, 800 pounds to 5 tons.

United States Motor Truck Co., Cincinnati, Ohio—United States. Gasolene, 2 and 3 tons; prices, $2,800 and $3,500.*

Universal Motor Truck Co., Detroit, Mich—Universal. Gasolene, 1 to 3 tons; prices, $2,750 to $3,400.

Velie Motor Vehicle Co., Moline, Ill.—Velie. Gasolene, 1,500 pounds to 3 tons; prices, $1,600 to $3,350.

Walker Vehicle Co., Chicago, Ill.—Walker. Electric, ½ to 3½ tons.*

Ware Motor Vehicle Co., St. Paul, Minn.—Ware.*

Waverley Co., Indianapolis, Ind.—Waverley. Electric, 600 pounds to 5 tons; prices, $1,800 to $4,000.

White Co., Cleveland, Ohio—White. Gasolene, 1,500 pounds to 5 tons; prices, $2,100 to $4,500.

The 138 Accessory Dealers and What They Display

* Denotes not shown in New York.

Ajax-Grieb Rubber Co., New York City—Ajax tires.

American Ball Bearing Co., Cleveland, Ohio—American axles and worm gearing.

American Bronze Co., Berwyn, Pa.—Non-Gran bearing metal.

Aermore Mfg. Co., Chicago, Ill.—Aermore exhaust horns.

Auto Parts Mfg. Co., Muncie, Ind.—Gears, pedals, levers, etc.*

Automatic Motor and Engineering Co., Chicago, Ill.—Church pneumatic system.*

Badger Brass Mfg. Co., Kenosha, Wis.—Solar lamps.

Baldwin Chain & Mfg. Co., Worcester, Mass.—Baldwin chains.

Baldwin Steel Co., New York City—Baldwin steels.

Benson Gear Co., Chicago, Ill.—Benson gears.*

Bower Roller Bearing Co., Detroit, Mich.—Bower roller bearings.

Bowser & Co., S. F., Fort Wayne, Ind.—Fuel pump and storage systems.

Briggs Magneto Co., Elkhart, Ind.—Briggs magnetos, lighting and starting systems.

Brown-Lipe Gear Co., Syracuse, N. Y.—Brown-Lipe gears and gearsets.

Buda Co., Harvey, Ill.—Buda motors and gearsets.

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Byrne, Kingston & Co., Kokomo, Ind.—Kingston carburetters.

Champion Ignition Co., Flint, Mich.—A-C spark plugs.

Chicago Drop Forge & Foundry Co., Chicago, Ill.—Drop forgings.

Continental Motor Mfg. Co., Muskegon, Mich.—Continental motors.*

Cleveland Hardware Co., Cleveland, Ohio—Drop forged parts.

Cotta Gear Co., Rockford, Ill.—Cotta transmissions.*

Cotta Transmission Co., Rockford, Ill.—Gearsets.

Empire Tire Co., Trenton, N. J.—Empire tires.

Edmunds & Jones Mfg. Co., Detroit, Mich.—Lamps.

Electric Storage Battery Co., Philadelphia, Pa.—Exide storage batteries.

Esterline Co., Lafayette, Ind.—Berdon electric lighting and starting system.

Federal Chain & Mfg. Co., Springfield, Mass.—Federal non-skid devices.

Findeisen & Kropf Mfg. Co., Chicago, Ill.—Rayfield carburetters.

Firestone Tire & Rubber Co., Akron, Ohio—Firestone tires.

Goodyear Tire & Rubber Co., Akron, Ohio—Goodyear tires.

Gould Storage Battery Co., New York City—Gould batteries and Duplex lighting and ignition systems.

Gray & Davis, Amesbury, Mass.—Lamps and electric starting and lighting systems.

Harris Oil Co., A. W., Providence, R. I.—Lubricants.

Ham Mfg. Co., C. T., Rochester, N. Y.—Lamps.*

Harrow Spring Co., Kalamazoo, Mich.—Springs.*



ALMOST A BIRDS-EYE VIEW OF THE TRUCKS STAGED IN THE ARMORY

Cleveland Worm & Gear Co., Cleveland, O.—Cleveland worms and worm gearing.

Cramp & Sons Ship & Engine Bldg. Co., Wm., Philadelphia, Pa.—Parsons's white brass and bronze bearing metals, bearings and worm gears.

Dayton Steel Foundry Co., Dayton, Ohio—Steel castings*

Detroit Lubricator Co., Detroit, Mich.—Detroit lubricators.

Diamond Chain & Mfg. Co., Indianapolis, Ind.—Diamond chains.

Diamond Rubber Co., Akron, Ohio—Diamond tires.

Dixon Crucible Co., Jos., Jersey City, N. J.—Graphite lubricants.

Economy Equipping Co., Chicago, Ill.—Campbell gearsets.*

Edison Storage Battery Co., West Orange, N. J.—Edison batteries.*

Fisk Rubber Co., Chicopee Falls, Mass.—Fisk tires.

Frasse, Peter A., New York City—Fischer steel parts.

Gabriel Horn Mfg. Co., Cleveland, Ohio—Gabriel horns and rebound snubbers.

Garage Equipment Mfg. Co., Milwaukee, Wis.—Hercules and Simplex bumpers and tire holders, Electrabola lamps and Gemco specialties.

Gemmer Mfg. Co., Detroit, Mich.—Gemmer steering gears.

Gibney Rubber Co., J. L., Philadelphia, Pa.—Tires and vulcanizers.

Globe Machine & Stamping Co., Cleveland, Ohio—Steel tool boxes, metal hampers, fenders and sheet metal parts.

Goodrich Co., B. F., Akron, Ohio—Goodrich tires.

Hartford Suspension Co., Jersey City, N. J.—Truffault-Hartford shock absorbers., Hartford electric starting and lighting systems and jacks and bumpers

Havoline Oil Co., New York City—Havoline lubricants.

Hess Spring & Axle Co., Carthage, Ohio—Springs and axles.

Heinze Electric Co., Lowell, Mass.—Magnetos and coils.

Highland Body Co., Cincinnati Ohio—Commercial bodies.*

Herz & Co., New York City—Herz magnetos and timers and other ignition apparatus.

Homo Co. of America, Philadelphia, Pa.—Homo carburetters.

Hyatt Roller Bearing Co., Newark, N. J.—Hyatt flexible spiral steel roller bearings.

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Ignition Starter Co., Detroit, Mich.—Disco acetylene and electric starting and lighting systems.

Imperial Brass Mfg. Co., Chicago, Ill.—Carburetters and brass parts.*

Ingersoll-Rand Co., New York City—Pumps.

Kent Mfg. Works, Atwater, Philadelphia, Pa.—Unisparker ignition systems and Monoplex horns.

Kelly-Springfield Tire Co., New York City—Kelly-Springfield tires.

Kokomo Electric Co., Kokomo, Ind.—Kingston magnetos, coils and timers.

Lavigne Gear Co., Corliss, Wis.—Lavigne steering gears.

Lefever Arms Co., Syracuse, N. Y.—Gearsets.

Link Belt Co., Philadelphia, Pa.—Silent chains.

La Crosse Knitting Works, La Crosse, Wis.—*

Marburg Bros., Inc., New York City—Mea magnetos, S. R. O. bearings.

McCord Mfg. Co., Detroit, Mich.—Radiators, lubricators, fans and McKim gaskets.

Merchant & Evans Co., Philadelphia, Pa.—Hele-Shaw clutches, Evans transmissions and other parts.

Model Gas Engine Works, Peru, Ind.—Model motors.

Motsinger Devices Mfg. Co., Pendleton, Ind.—Motsinger autosparkers and carburetters.

Motz Tire & Rubber Co., Akron, Ohio—Motz cushion tires.

Muncie Gear Works, Muncie, Ind.—Gears, wheels and gearsets.

National Coil Co., Lansing, Mich.—Spark coils.

National Tube Co., Pittsburg, Pa.—Seamless steel tubing.

Never Skid Mfg. Co., New York City—Nonskid devices.

New York & New Jersey Lubricants Co., New York City—Columbia lubricants.

New Miller Carburetter Co., Indianapolis, Ind.—New Miller carburetters.

Norma Co. of America, New York City—Norma ball bearings.

Northway Motor & Mfg. Co., Detriot, Mich.—Northway motors.

Oliver Mfg. Co., Chicago, Ill.—Oliver and Sampson jacks.*

Pantasote Co., New York City—Pantasote top and seat coverings.

Pennsylvania Rubber Co., Jeannette, Pa.—Pennsylvania tires.

Perfection Spring Co., Cleveland, Ohio—Krupp steel springs.

Philadelphia Storage Battery Co., Philadelphia, Pa.—Philadelphia storage batteries.

Pioneer Steel Block Tire Co., St. Louis, Mo.—Pioneer tires.

Pittsfield Spark Coil Co., Pittsfield, Mass.—Pittsfield magnetos, coils, etc.

Polack Tire Co., New York City—Polack tires.

Pratt Mfg. Co., Wm. E., Chicago, Ill.—Jackson bumpers and other parts.*

Recording Speedometer Co., Newark, N. J.—Truck recorders.

Remy Electric Co., Anderson, Ind.—Remy magnetos, lighting and starting systems.

Republic Rubber Co., Youngstown, Ohio—Republic tires.

Rhineland Machine Works Co., New York City—Rhineland bearings.

Ross Gear & Tool Co., Lafayette, Ind.—Steering gears, differentials and other tools.

Royal Equipment Co., Bridgeport, Conn.—Duplex and Raymond Brakes, Raybestos brake linings, Gyrex mixers.

Rutenber Motor Co., Marion, Ind.—Rutenber motors.*

Sarco Engineering Co., New York City—Coventry chains.

Schrader's Sons, Inc., A., New York City—Universal Tire valves and pressure gauges.

Sewell Cushion Wheel Co., Chicago, Ill.—Sewell resilient wheels.

Service Recorder Co., Chicago, Ill.—Truck recorders and Coronet hub odometers.

Sheldon Axle Co., Wilkes-Barre, Pa.—Axles and springs.

Smith Co., A. O., Milwaukee, Wis.—Parts.

Spicer Mfg. Co., Plainfield, N. J.—Spicer universal joints.

Splitdorf Electrical Co., Newark, N. J.—Splitdorf magnetos, coils, plugs and other ignition devices, also electric lighting system.

St. Louis Tire & Rubber Co., St. Louis, Mo.—Tires.*

Standard Roller Bearing Co., Philadelphia, Pa.—Standard ball and roller bearings.

Stewart & Clark Mfg. Co., Chicago, Ill.—Stewart speedometers.

Stromberg Motor Devices Co., Chicago, Ill.—Stromberg carburetters.

Swinehart Tire & Rubber Co., Akron, Ohio—Swinehart tires.

Schwarz Wheel Co., Philadelphia, Pa. Wood wheels.

Texas Co., New York City—Lubricants.

Timken-Detroit Axle Co., Detroit, Mich.—Timken hollow cast steel wheels and bevel and worm axles.

Timken Roller Bearing Co., Canton, Ohio—Timken taper roller bearings.

Torbensen Gear & Axle Co., Newark, N. J.—Gears and axles.

Tuttle Spring Co., Chicago, Ill.—Springs.*

United States Light & Heating Co., New York City—U. S. L. starting and lighting systems and storage batteries.

United States Tire Co., New York City—United States tires.

Vacuum Oil Co., New York City—Mobiloils and greases.

Veeder Mfg. Co., Hartford, Conn.—Veeder tachometers, odometers and die cast parts.

Vesta Accumulator Co., Chicago, Ill.—Vesta storage batteries and electric lighting systems.

Wallman Mfg. Co., Milwaukee, Wis.—Oil tanks and storage systems.

Wasson Piston Ring Co., Hoboken, N. J.—Wasson piston rings.

Waukesha Motor Co., Waukesha, Wis.—Waukesha motors.*

Warner Gear Co., Muncie, Ind.—Gears and parts and Gardner engine starters.

Warner Mfg. Co., Toledo, Ohio—Gearsets and control levers and electric engine starters.

Warner Instrument Co., Beloit, Wis.—Warner autometers.

Weed Chain Tire Grip Co., New York City—Weed chains.

Weston-Mott Co., Flint, Mich.—Axles and parts.

Westinghouse Electric & Mfg. Co., Pittsburg, Pa.—Motors, starting and lighting outfits, vulcanizers, horns, etc.

Wheeler & Schebler, Indianapolis, Ind.—Schebler carburetters.

Whitney Mfg. Co., Hartford, Conn.—Whitney chains.

Willard Storage Battery Co., Cleveland, Ohio—LBA storage batteries.

Williams Co., J. H., Brooklyn, N. Y.—Drop forgings and wrenches.

Wolverine Lubricants Co., New York City—Wolverine lubricants.

Krit Branch Takes Over Four States.

The Krit Motor Car Co., of Detroit, has opened a branch in Kansas City, which will be in charge of G. H. Cairns, who previously was connected with the Krit factory in Detroit. The branch, which will handle the States of Kansas, Missouri, Oklahoma and Colorado, will be located on the premises of the Bond Motor Co., at 1615 Grand avenue, which previously handled the territory and which will continue to represent the Krit car in Kansas City itself.

Fisk Locates a Branch in Iowa.

The Fisk Rubber Co. has located a factory branch and service station in Des Moines, Ia., at 711 Locust street. It is in charge of P. J. Kennedy, who obtained the necessary experience in the Fisk factory at Chicopee Falls, Mass.

U. S. Tire Locates Two Branches.

The United States Tire Co. has established branches in Salt Lake City, Utah, and Grand Rapids, Mich. The former is in charge of Sidney Theobold and the latter under the direction of C. L. Sowers.

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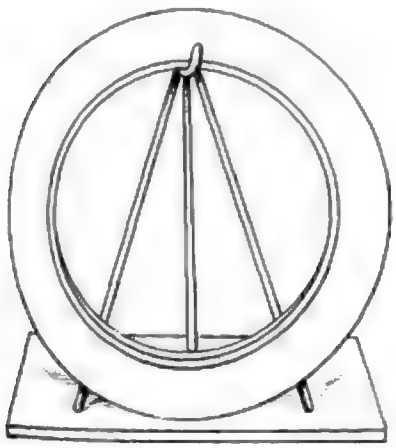
FIXTURES AS AN AID TO EFFECTIVE DISPLAY

How "Keeping" Merchandise May Be Turned Into Selling It With the Aid of Simple Devices—Some of the Fixtures Employed by Tire Makers—Fallacy of the Dusty Shelf Principle.

"Goods well displayed are half sold" is a selling maxim, or axiom, that has done duty for more than a day. Probably the beads and the $24 that bought Manhattan Island were well displayed—in fact, almost from the day of the famous ark to the day of the automobile, which is quite a long stretch, merchandising of practically every kind has required some sort of a display of the wares to be disposed of.

Adequate Display Is Essential.

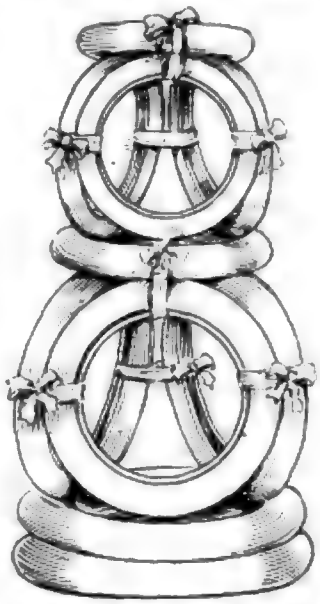
Modern merchandising, which is quite a little different from ancient merchandising—"sight unseen" or otherwise—not only requires display, it demands display. And of all merchandising, the selling of automobiles and automobile accessories probably demands proper display as much as, if not more than, any other. All of which already is known. But to carry along the original idea, goods well displayed require fixtures for displaying them, which, apparently, is not so well known, at least to a large majority of dealers.



FIRESTONE COUNTER FIXTURE

Slowly, however, the idea is being borne in upon the retailer that it is not possible to display goods on shelves or counters or in boxes (closed boxes be it added) or in drawers, and that the goods themselves are in the majority of cases their own best advertisement. Show cases are a little better, though it is not always easy to dispose wares in a showcase so that they will appear to the best advantage; besides, there are cases without number where the possibility of closer examination by a prospective purchaser would have resulted in a sale. Which, of course, emphasizes once more the necessity for display fixtures.

Really wise accessory dealers appreciate the necessity, and a few of them employ fixtures that leave little to be desired, as far as their effectiveness in displaying wares is concerned. Also, the small hardware dealer in a small town, who just has taken on automobile accessories as a "side line" appreciates it, as do the majority of department stores, and unless the exclusive accessory dealers and the automobile dealers who sell accessories, awaken to the real needs of merchandizing, the hardware men and the department stores are likely to get a much bigger slice of the profit that goes with the selling of accessories, and much of it will come through the use of effective display fixtures.

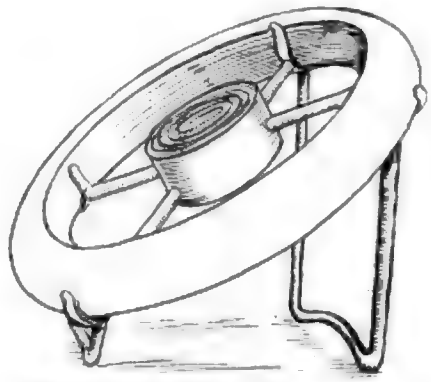


TIRE DISPLAY WITHOUT FIXTURES

Initiative of the Tire Makers.

That there are many methods of displaying accessories in a "fetching" manner was evidenced at the recent automobile shows, though of all the manufacturers represented no group appears to have "gone into" the matter as deeply as have the tire makers and as a result few goods were displayed to better advantage. Manifestly, tires are not the easiest thing in the world to display in an attractive manner. They are heavy and unwieldly and they all look more or less alike, except as regards their treads, which may symbolize anything the maker may choose, from buttons to basket weaves or from chains to channels. Still, few of the tire makers whose wares were displayed experienced particular difficulty in making effective exhibits, and what is even more to the point, almost any of the fixtures employed are as easily applicable to the retail dealer's store as it is to an automobile show.

The easiest day the dealer can take advantage of advertising and promote sales is by gratifying the public's curiosity and exhibiting the wares in such a way that they can be plainly seen. Again, there appears the necessity for proper fixtures, no matter what the particular wares may be—whether they are tires or trunks or carpet tacks. Incidentally, it is a psychological fact that the average individual will buy what he sees if he sees it in the right light, and it is the purpose of the store fixture to hold goods up to his view where he cannot very well miss them.



THERMOID TIRE AND TUBE STAND

Ingenuity Only Is Necessary.

But to get back to tires, though it is not exactly easy to display them in an effective manner, it may be easier than is supposed. Greenery in the showroom always helps; it gives a restful background. And quite naturally, where the salesroom is devoted to the sale of tires exclusively, rubber plants are the most fitting decoration of the kind that can be chosen. Growing plants of any kind, however, lend a "happy" touch to the interior of almost any showroom.

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Where tires are shown in a dealer's store along with the heterogeneous mixture that goes to make up the stock, they, as well as anything else, may well be displayed and displayed well with the aid of a little ingenuity and possibly a few "properties," and occasionally even without them. They can be arranged so as to show themselves and at the same time form an effective decoration, and nothing more complicated is needed for a display of the kind than a few lengths of silk ribbon. For instance at the New York show, the Goodrich company had a more than ordinarily effective display of the kind. There were two pyramids of tires, one on the other, and the

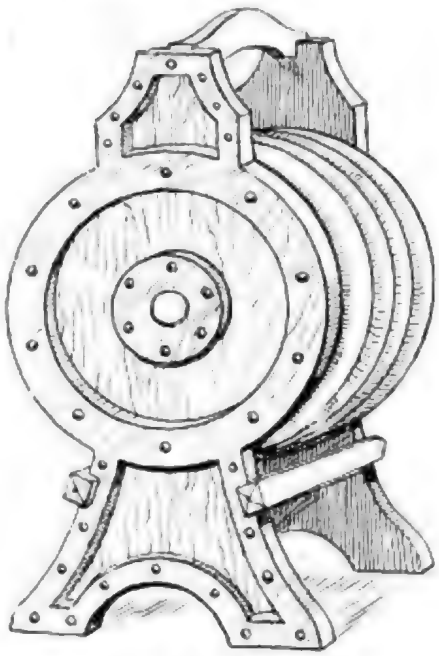


FISK ADJUSTABLE STAND

only visible and actual means of support were the tires themselves and a few lengths of ribbon. The ribbon was tied in bow knots where the tires came together, and in addition to giving stability to the uprearing, added a touch of beauty that helped draw attention. Needless to point out, it would be a very simple matter to arrange a display of the kind in almost any store or window. Show window displays, by the way, can be made just as effective with the aid of special fixtures, as can any other kind, whether the fixtures be just plain ribbons, as they were in the Goodrich display, or whether they be more pretentious devices. A pyramid of the kind presented by the Goodrich company shows to advantage either in the show window or on the salesroom floor. It is not merely decorative, but unusual, and therefore tends to compel notice.

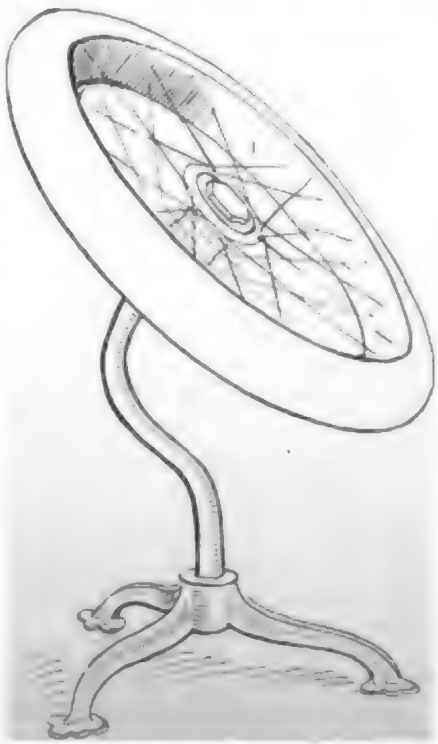
Floor Stands Stable and Effective.

The method of displaying Diamond tires was scarcely less effective, and was calculated to withstand as much handling as the tires would stand without causing salesmen to have any of the symptoms of heart fail-



ORNATE U. S. TIRE RACK

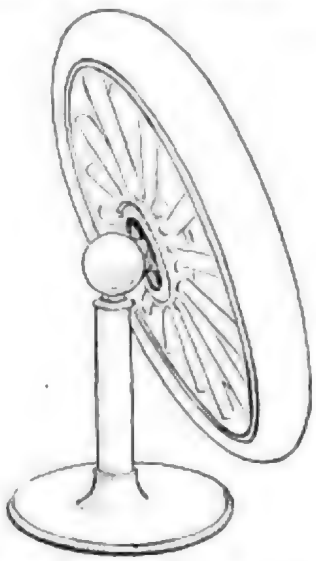
ure regarding the stability of the whole under unusually hard prodding by more or less interested spectators. In its simplest aspect, it was merely a couple of circular platforms, one over the other with the tires arranged triangularly upon them, the effect obtained being much the same as that obtained by the Goodrich display. Obviously a display stand of the kind would form an ideal device for a dealer's store, where, placed directly in the center, it could not fail to attract attention, it would be decorative to a degree, it would be stable, and it would be a simple matter to vary the ex-



EFFECTIVE WIRE WHEEL DISPLAY

hibit, and an easy one, by changing the brand or the type of tires displayed.

In not a few cases, much of the appeal of the display lies in the shape and appearance and finish of the fixture almost as much as it does in the wares displayed. In fact, the theory behind the use of display fixtures indicates that the appearance of the fixtures themselves should be second only in importance to the efficacy of the devices as "silent salesmen." An example in point is the display stand employed by the United States tire company, an ornate structure lone in quartered oak and highly finished. It was by far the most pretentious of the display fixtures, but withal it was not obtrusive. In construction, it is not unlike those types of desk bookcases designed to hold a number of volumes upright before the occupant of



LEE ADJUSTABLE WHEEL HOLDER

the swivel chair; like such bookcases, its contents are disposed between the two end sections in such a way that any one may be removed for inspection without the necessity for disturbing the others.

The use of either of these three methods of display naturally presupposes the use of the floor as a resting place, and each has as its object the elevation of the tires to a position where they may be more easily inspected or handled. Which fact serves to bring to notice that tires may be displayed even on a counter and that fixtures for the purpose are available.

Simplest Form of Tire Holder.

Of all the devices of the kind, probably the simplest is nothing more than a hollowed block of wood finished as the dictates of the maker may fancy—for the device is easily made by any one who is handy with tools. The hollowed portion may be scooped out with a gouge to fit the diameter of the tire for which the block is intended and the tire will hold itself in place with

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a partially inflated tube in the casing. Obviously, symptoms of instability can be eliminated by fastening the block to the counter with a single screw hidden by the tire itself. The device is not new, of course, and already has been put in use by a number of progressive tire dealers. The block forms a compact support that is cheap and may be used with equal facility on the counter, the floor or in the show window. Which is true, also, of very nearly all the other counter display fixtures that have been evolved.

Simple Wood Block Counter Fixture.

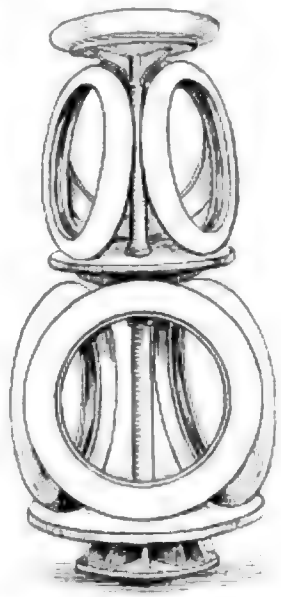
Firestone tires, for instance, were displayed on a triangular stand than which few were simpler, though it served its purpose admirably. Complicated devices defeat their own object in a measure by detracting from the goods that are displayed upon them, and for effectiveness simplicity is essential. But instead of increasing the difficulty of devising devices of the kind, the necessity for simplicity really makes their construction that much simpler; a polished board with a nail in it upon which to hang a tire will form a more effective display than will a complicated device with a whole lot of nickel-plated and spidery arms stretching to every point of the compass. Of course, the board should be tastefully finished and the nail should be an ornamental spike.

Elaborating somewhat upon the method devised to display Firestone tires, the Fisk company employs a small, substantial stand carrying an adjustable rod with nothing more complicated than a hook at its extremity upon which to hang a tire. Being adjustable, the stand is suitable for the display of almost any size tire from a miniature aeroplane shoe to the largest size tire constructed for the heaviest cars. It is quite simple, and it is equally simple to alter the display frequently.

Killing Two Birds With One Stone.

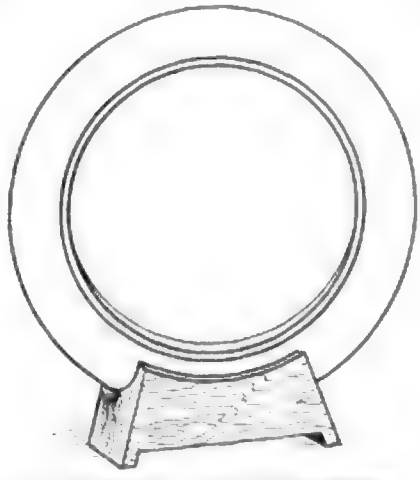
Somewhat different and a little more pretentious is the fixture devised by the Thermoid company; it serves a dual purpose. The fixture has a "hub" which is really a tube receptacle, and from the hub four arms radiate to an outer rim which supports the tire; a third leg holds the fixture firmly. Thus, the single device serves to display both the tube and the tire, though despite this fact it scarcely can be termed complicated. Like all the other devices, it is suitable alike for use on the counter or in the show window and is equally effective in either place.

Carrying the display a little further by showing the tire as it actually appears on a wheel is a comparatively common expedient that has the additional advantage of showing also the rim and its method of attachment. Naturally, the construction of a stand of the kind involves greater complication, for it necessitates the use of an axle stub. Lee tires were shown on a stand of the kind, the axle stub being mounted in a



DIAMOND FLOOR TIRE STAND

ball and socket joint at the top of the standard, thus permitting the angle of the wheel and tire to be changed to fit requirements. In a show window, for instance, the wheel and tire can be arranged at only a slight angle to the standard, thus permitting the display of smaller wares beneath the wheel. The display stand at the Standard Welding Co.'s exhibit differed from the other only



SIMPLEST FORM OF TIRE SUPPORT

in that the base consisted of three feet triangularly arranged and that it mounted a wire wheel and tire. A slight bend in the standard permitted the display of the wheel at the proper angle and made the whole less liable to topple over.

All of these devices are simple; even a poor mechanic could make almost any of them at slight expense and in a very short time. And if, as the old saying goes, "what is sauce for the goose is sauce for the gander," and what is good for one is good for the other, it would seem that those dealers who have been progressive enough to see the value of display fixtures and to go to the length of using them are in a fair way to leaving their less progressive brothers—exponents of the dusty shelf principle—far behind.

Oriental Air at Hartford Show.

Hartford is in the throes of its sixth annual automobile show. The exhibition opened on Saturday evening last, February 8th, under the auspices of the Hartford Automobile Dealers' Association and the First Infantry, C. N. G., and, as has been the case with previous shows, is staged in the drill hall of the State Armory. The show will be in progress for one week—until Saturday evening next, February 15th.

The decorative artist traveled far to obtain his setting. India supplies it, and the drill hall "dressed up" looks for all the world like a little patch of that Far Eastern country. One entire side of the hall is covered with a single canvas depicting the Temple Taj-Mahal, and each of the other three sides are covered with paintings of smaller dimensions, all of which blend to complete the picture. And neither are the flora and fauna missing, for vines and flowers are there, which if not truly Indian are at least foreign to Connecticut, while Bengal tiger heads supported on spears serve to bear the shield-shaped signs which announce the various products. Artificial stars and blue sky cover the ceiling.

In the matter of exhibits, 43 different makes of vehicles, both pleasure and commercial, are shown by 30 dealers; with the accessory dealers the list of exhibitors reaches the even hundred.

The cars on display are: Baker electric, Buick, Cadillac, Cartercar, Case, Chalmers, Chevrolet, Columbia, Cutting, Detroit electric, Fiat, Flanders electric, Ford, Henderson, Hudson, KisselKar, Lippard-Stewart, Locomobile, Lozier, Maxwell, Mitchell, National, Oakland, Overland, Packard, Paige-Detroit, Peerless, Pierce-Arrow, Pope, Premier, Rambler, Regal, Reo, Standard electric, Stearns, Stevens-Duryea, Stewart, Studebaker, Stutz, Waverley electric, White, Winton, Woods electric.

Carbide to Start Balky Engine.

A wrinkle that is not difficult to apply and which, on occasion, will help to start a balky motor is to put a little carbide into water directly under the carburetter air intake and crank the motor while the acetylene gas is rising. Ordinarily, a lump as big as a hazel nut will give off enough gas to do the trick.

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ELECTRIC ROAD LOCOMOTIVE TO HAUL FREIGHT

Ponderous Double-ended Machine That Drives Through All Four Wheels and is Steered Like a Steamboat—Curious Combination of Motor Construction and Standard Railroad Equipment, Including Air Brakes.

For thirty years the Pennsylvania Railroad has been hauling freight cars through some of the streets of Jersey City, N. J., by brute force—that is to say, they have used horses. Cars arriving at the Exchange Place terminal consigned to the American Sugar Refining Co., Colgate & Co., and other big concerns located along Hudson, Essex and Washington streets have been hauled out of the yards and through thick street traffic by eight heavy draught animals. Going up Essex street there is a very heavy grade, as railroad grades go, which begins on the very sharp curve from Hudson street. In bad weather, and when loads are exceptionally heavy the cars are dragged up the grade by means of block and tackle. The horses are inconvenient and expensive, the process of delivering cars slow and unsatisfactory in bad weather, and altogether the arrangement is one which has been fervently condemned, especially in late years, because of the increasing difficulties due to heavy cars and street traffic which steadily is becoming greater.

The sharp curve makes it impossible to use a locomotive, even if the intermittent character of the work warranted the detailing of an engine for the purpose, and the railroad company has watched with much interest the increasing efficiency and power of motor trucks. About a year and a half ago a number of tests were made with the heaviest machines available, with a view to replacing horses with motor trucks. None of the cars was found equal to the work, all being too light. The tests served as an inspiration, however, and Tracy V. Buckwalter, chief electrical engineer at the Altoona shops of the P. R. R., addressed himself to the task and brought out the tractor shown in the accompanying illustrations.



PENNSYLVANIA RAILROAD'S MAMMOTH ELECTRIC TRACTOR COMPARED WITH BAGGAGE COACH, SHOWING ITS SIZE

"Tug o' War" Test Indulged in.

While the machine has not as yet been put into active service, having been at the terminal only a couple of weeks, serving as a "training ship" for the two men who will operate it, tests made at Altoona indicate that it is fully equal to the work for which it was built. The most spectacular trial was a sort of shoving match with a locomotive. Two loaded gondola cars were placed together with the tractor coupled to one end and a standard switching engine at the other. At a signal, steam was turned on in the locomotive and electricity in the tractor, and after a short period of silent straining the locomotive and the two cars were slowly pushed back by the tractor. Of course, the tractor was working under more favorable conditions, in a way, than the locomotive, for the torque of a pair of electric motors at low speed is tremendous, while the steam engine was limited by its boiler pressure. However, heavy pulling at slow speed is what the tractor is designed for, so the test was considered very satisfactory. The speed is eight miles an hour.

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The Buckwalter tractor is a battery-driven machine, having two electric motors, of a nominal rating of 10 horsepower each, but with an overload capacity of something like 250 per cent., placed under two hoods, one at either end of the car, and driving all four wheels through double reduction gearing, having a total reduction of 40 to 1. All four wheels are steered also, and one of the most striking peculiarities of the tractor is that instead of the conventional automobile type of steering wheel there is a regulation tug-boat spoked wheel in the middle of the cab. The enormous weight of the machine—28,850 pounds—made imperative the employment of a steering gear of great leverage, and the marine type of wheel is found to answer the purpose satisfactorily. The length of the tractor is not excessive, being 22 feet over all; the tread, however, is wide, there being 6 feet clear inside the wheels, so that they can run easily outside the rails, even on curves. The wheel rims are a foot wide, making the tread, as ordinarily measured, seven feet. The wheelbase is 12 feet and the wheels, which are 60 inches in diameter, are fitted with rubber block tires bolted on in sets of three blocks with steel bases. The tires are dual and have a total width of 10 inches.

In keeping with its role as a locomotive, the tractor is fitted up with a complete air-brake equipment, including a pump driven by an individual electric motor, with the usual hose connections to carry air to the cars to which it may be coupled. The drawheads are of the standard P. R. R. type, automatic, with safety outside uncoupling levers.

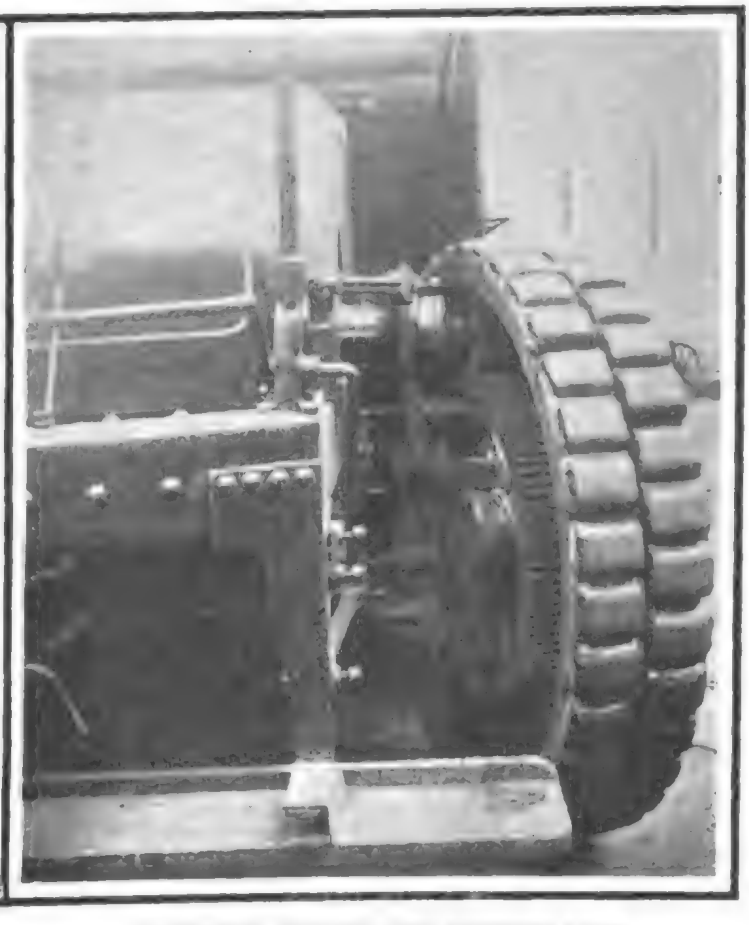
Duplicate Control Elements Provided.

Instead of the usual springs they are cushioned by pneumatic cylinders capable of resisting a pressure of 10,000 pounds before "bottoming" the pistons. Being a double-ender down to the last detail, the controlling and braking apparatus is duplicated in the cab, so that whichever way the driver faces, he has the levers at his right hand. Each control lever works in a slot in a sector; the forward half of the swing controls the three forward speeds and the rear half three exactly similar speeds in the opposite direction; the slot is not continuous, however, but is divided into two sections by a bridge which stops the lever in a vertical position, and in order to reverse it is necessary to pull the handle out of its socket and insert it in a similar socket which comes just at the opposite side of the bridge when the lever is in neutral position. This makes unintentional reversing impossible. In making a sudden stop it is unnecessary to turn off the current; as soon as the air brake is applied, which is done in the usual locomotive way, the controller lever flies back to neutral. In backing up for a short distance the driver shifts his handle to the reverse side of the sector, but in making a return trip or for running any distance he shifts it to the opposite side of the cab, moves over to the other side of his steering wheel, and at once that which was backward becomes forward, and still the driver has all his controls in exactly the same relative positions as before. In addition to the air braking system there is an auxiliary hand brake, operated by a small brass hand wheel, which may be used in case of the failure of the air. In view of the reliability of the standard air-brakes, however, this contingency is regarded as a remote one. The braking action is extremely prompt and effective, and it is an easy matter to stop the tractor within a distance very considerably less than its own length when moving at maximum speed. It is stated that in an emergency a stop can be made within three feet, if there is good holding ground for the wheels.

Not the least interesting feature of the machine is the system by which all four wheels are utilized as drivers as well as steerers. The mechanism is divided into two separate sets, one for the two driving wheels at each end, which are exactly dupli-



"PILOT HOUSE" AND CONTROL MECHANISM



INGENIOUS DRIVING AND STEERING AXLE

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rates and work independently, though drawing current from the same battery. The motors are of General Electric manufacture, series wound, 85 volts, and each drives through heavy spur gearing to a countershaft carrying a differential. The countershaft is extended laterally, the ends projecting from massive bearings and carrying spur pinions which mesh with large spur gears bolted to the wheels; the large gears are of such diameter that there is just room for the pinions between them and the wheel rims. The shafts are so located that a line drawn through the pivot center of the steering knuckle passes through the center of the pinion. Provision for the movement due to steering is made by mounting the pinion on a spherical joint on the shaft end, the joint being so constructed that while the pinion cannot turn on the shaft, it can swing to any angle within the limitations of the joint, and as the axis upon which it swings coincides with the steering pivot axis, there is no difficulty in transmitting power even when the wheels are deflected. The action of the joint will be better understood, perhaps, if it is considered as a universal joint with gear-teeth cut in its periphery. The wheels are of cast steel. The inner peripheries of the large gears are used as braking surfaces, the bands expanding against them in the usual way.

Huge Storage Battery Equipment.

Current is supplied to the motors by an Edison battery of 80 cells. The cells are the largest manufactured by the Edison company and have a capacity of 450 ampere hours, which is sufficient to give the tractor a range of about 40 miles on a single charge under ordinary working conditions—considerably more than is likely to be required, so that there is a margin for occasional long periods of continued hard work. The battery is carried under the cab, where it is readily reached through steel doors on the sides.

The tractor is carried on semi-elliptic springs, and the combination of big wheels, rubber tires, well-calculated springs and great weight results in surprisingly easy riding over rough ground. There is very little noise heard when riding in the cab, and when standing at a little distance the machine scarcely can be heard. An electric gong and an air whistle provide ample means for signaling, however. While the curious combination of mechanisms is apt to leave one somewhat confused as to whether the machine is an automobile or a locomotive, the question is settled by the fact that each end is decorated with an orthodox New Jersey automobile license tag, which presents an incongruous appearance just above the coupling and air-brake connections.

MINNEAPOLIS SHOW SET IN LIFELIKE RUSTIC SCENERY

Painting of Minnehaha Falls, With Natural Tree Trunks, Placed Beneath Illuminated Canopy—In National Circuit.

Although all of the exhibits were not on view—for the Minneapolis exhibit is this year a national circuit exhibit for the first time and not a few of the cars to be displayed were in transit from Chicago—the opening of the fifth annual show of the Minneapolis Automobile Trade Association in the Minneapolis State Armory on Saturday evening last, February 8th, was nevertheless auspicious. Monday morning last, the two train loads of cars from the Windy City arrived and the bare places of the opening night were quickly filled, completing the exhibition, which will remain open until Saturday evening next, 15th inst.

Of motor cars and motor car appurtenances there is little missing, for the 45 dealers who are exhibiting have on display the productions of some 60 different factories, while accessories are displayed by a half-hundred other dealers.

And if the ranks and the files of the exhibitors are complete, then the same term must apply to the decorations. The lofty ceiling has been converted—by virtue of the use of not an inconsiderable amount of blue bunting—into a blue sky in which myriad lights glitter, outlining the ceiling girders. The entire back wall of the armory is covered by a mammoth mural painting of Minnehaha falls and a degree of naturalness is lent to the setting by virtue of a cunningly contrived foreground of natural trunks and branches of trees. Large landscape paintings figure in the decorative scheme of the other three walls, and trailing southern smilax hides from view the railing which bounds the balcony. Eight life-size statues of the "Spirit of the Automobile," a young woman bearing a motor car wheel illuminated with purple lights, are placed at vantage points on the main floor and a mammoth seal of Minnesota, also illuminated, faces the main entrance.

The cars on view are: American, Stutz, Premier, Paterson, R-C-H, Hudson, Speedwell, Cutting, Jackson, Stanley, Packard, Imperial, Luverne, Richmond, McIntyre, Marathon, Mercer, McFarlan, Franklin, Knox, Cartercar, Chevrolet, Little, Henderson, Pathfinder, Hupmobile, Mitchell, Paige-Detroit, Apperson, Stoddard-Dayton, Cadillac, Lozier, Stearns-Knight, Buick, Nyberg, Regal, Stevens-Duryea, Fiat, Inter-State, Moon, Flanders, Auburn, Pierce-Arrow, White, Penn, Overland, National, Garford, Firestone-Columbus, Colby, Case, Velie, Ford, Locomobile, Lambert, Buckeye, Moline, Krit, Cole, Kisselkar, Oakland, Oldsmobile, Studebaker, Maxwell, Winton, Abbott-Detroit, Herreshoff, Peerless, Westcott, Chalmers, King, Detroiter, Empire, Havers, Marion, Rambler, Metz, Staver, Reo, Marmon.

Two Buildings for Youngstown Show.

Having acquired such proportions that the Auditorium no longer is able adequately to house it, the annual Youngstown (Ohio) automobile show—the third under the management of the Youngstown Automobile Dealers' Association—which was inaugurated on Saturday evening last, February 8th, was partially housed in an annex specially built for the purpose and which is connected with the larger building that houses the greater portion of the show. While decorations in the shape of bunting strips and streamers serve to hide bare walls and ceilings and render both new and old buildings eye-pleasing, the effort of the management has been directed more toward the exploitation of vehicles than to "garnishing" the buildings, and to this end aisles have been made wide and display spaces large, so that each of 35 different makes of motor vehicles, cars and trucks, is shown to best advantage. The vehicle displays are made by 20 dealers, while three others exhibit accessories.

The cars on view are: Regal, Moon, Buick, Little, Cole, Packard, Hudson, Rauch & Lang, Oldsmobile, Oakland, Reo, Standard electric, American, Overland, Auburn, Service truck, Michigan, McFarlan, Kline, Peerless, Studebaker, Baker electric, Federal truck, Warren, Moon, Avery truck, Cartercar, Cadillac, Winton, Chalmers, Paige-Detroit, Ford, White truck, Koehler commercial, Mercer.

Cooper Comes Close to Dirt Record.

Earl Cooper, driving a Stutz car on the one-mile track at Fresno, Cal., on Monday last, February 10th, covered 200 miles in 3:28:5.2, which is dangerously close to the dirt track record of 3:28.04 for the distance, made by Louis Strang at Columbus, Ohio, in July, 1909. Cooper's time was made in a time trial run under A. A. A. sanction and under the auspices of the Cooper brothers, who are the California distributers for Stutz cars.

Perceptible Improvement in English Humor

British humor may not be so sad, after all. As witness: One Englishman describes a bumpy road as shocking, and further rises to remark that a new 'bus that has been put in use in London is so covered by patents that presumably there will be no room for advertisements.

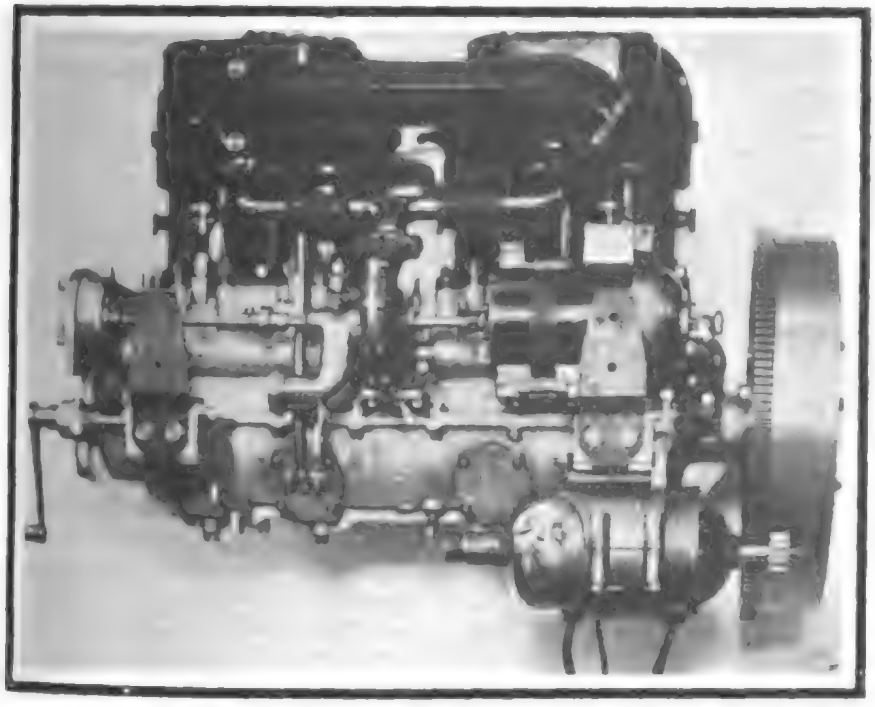
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CARING FOR ELECTRIC STARTING EQUIPMENT

The Burden That the Owners' Ignorance Places on the Dealer and How Study Will Make It Lighter for Both—Peculiarities of Series Motors Made Plain—Rushmore System as an Example of Simplicity.

(This is the eighteenth of a series of articles designed to make clear the electric lighting and engine starting systems in use and to render easier their care and repair by the dealer and owner alike.)

The formal adoption of any electric lighting and engine starting system by the manufacturer of a car naturally presupposes a degree of simplicity in the system that will preclude the necessity for any more "fussing" on the part of the dealer or the owner than is necessary. Assuming even that the owner really likes to "fuss" with it, which means that he likes to take care of it, to clean it and to make such minor adjustments as from time to time become necessary, he is likely to be more than perturbed if the "fussing" is a necessity and is not merely an excuse for working off some of his own surplus energy.



RUSHMORE MOTOR AND GENERATOR, SHOWING METHOD OF MOUNTING

Why Simplicity is Necessary.

There are two reasons, therefore, for obtaining the greatest possible degree of simplicity. The first of them is to reduce to the minimum the amount of care and adjustment that actually is necessary and to make the care and adjustment easy of accomplishment by the "man in the street." And the second of them is to reduce the amount of possible damage that can be done by unknowing fingers in prying into apparatus which, under the circumstances, would be better let severely alone.

"Fussing" that Burdens the Dealer.

Not that it is hard for any one endowed with enough intelligence to operate an automobile to learn how to take care of an electric lighting and engine starting system; it is simple, though the statement has been reiterated so often that it is getting like to the story of the boy who cried "Wolf!"—no one takes any notice of it or it is taken for granted, which amounts to the same thing in the end, so far as the actual acquisition of knowledge by the owner is concerned. Also, in the end, the dealer almost invariably bears the burden.

How does the owner's anxious, though none the less harmful, "fussing" place the burden on the dealer? Suppose, for instance, that John Smith purchases a car from a local dealer and that it is equipped with a fearfully and wonderfully constructed lighting and starting system that would defy a Philadelphia lawyer to unravel—which it is not, of course, for there are no such systems. But just suppose that it is. Forty miles from nowhere in particular, Smith discovers with a pang that his lights are growing dim; he stops his car and his motor to remedy the defect in his clumsy way, if he can, and an even worse calamity appears in the refusal of the electric starter to extort a sympathetic chortle from the engine, when, dispairing of disposing of the gloom shed, figuratively, by his lamps, he endeavors to be on his way. So he gets out his hibernating crank and cranks up and drives home and to the dealer from whom he purchased the car; maybe he puts candles in his head lamps in lieu of the deceased electric bulbs, which expedient is not altogether unknown.

Failings of Household Electricians.

That is to say, he drives first to the dealer, if he is wise. If he is not wise, he drives first to some itinerant electrician whose fund of knowledge consists in knowing how to hang electric bells and door openers and wire burglar alarms. If the so-called electrician admits his inability to cope with the intricacies of the system all is well and good; there still remains an even chance for its recovery under proper hands. Generally, however, tainted money looks just as good to him as does any other kind and he proceeds to "chuck a bluff" to the detriment of the system and the depletion of the owner's pocketbook. Of course, he does no good, and if he does no harm more is the credit to him; he may be an electrician, after all.

Doubling the Repairman's Work.

Generally, however, the fraternity of household electricians is worse than useless in such predicaments and the automobile owner would do well to shun its members, for, as a rule, it is beyond their ken just why the makers of such apparatus persist in sticking to construction which to their minds is so palpably wrong. They proceed to "fix" it; and no one who has had any experience with them can reasonably doubt that they are great little fixers—of a kind. The dealer is the logical person to whom the motorist should turn, and right here becomes apparent the burden the dealer must bear.

In nine cases out of ten, all the Smiths

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that ever attempt to remedy lighter and starter troubles without knowing just how to go about it, make matters a great deal worse; they almost invariably do the wrong thing at the wrong time. Which means, of course, that in addition to straightening out the difficulty that causes the cessation of activities of the apparatus in the first place, the dealer has also to clean up the mess that has been left by the owner by reason of his ignorance. He has virtually a double portion of work to do.

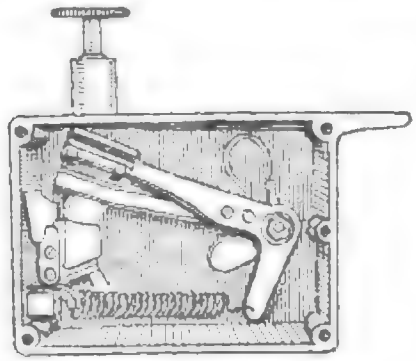
Real Complexity Non-Existant.

In this respect, it is only fair to add that the average dealer is fully able to cope with the difficulties, provided only that no serious breakdown has occurred—that the wiring is not burned out in either the generator or the motor, for instance. It has been borne in on dealers within the past few months that they must be able to do so if they are to maintain their reputation for that everything which is embraced by the word "service." Logically, the dealer wants a simple electric lighting and starting system, for with one he knows that the amount of damage the owner inadvertently can do will not be as great as can be done with a highly complicated one. And it goes without saying that the owner wants a simple system, for he wants the assurance that he can take care of it if necessary. Needless to add, for it already has been pointed out many times in the seventeen preceding articles which have appeared in Motor World, none of the existing systems is too complicated for the average person easily to "learn by heart," though he cannot expect to learn by sitting idly by with folded hands in silent contemplation. Nor will mere printed instructions alone suffice; he must "dig in" and learn by experience.

Elimination of Rods and Wires.

Simplicity in the concrete concerns the method of attaching and connecting the apparatus quite as much as it concerns its "internal economy"—the parts that seldom are seen or touched or thought of. Which means, briefly, that, in so far as is possible with proper operation and due regard for strength, rods and wires and brackets and other parts must be eliminated. The truly simple system would be one in which the motor and generator are integral with the gasolene motor, everything is automatic in the fullest sense of the word and attention of any kind never is necessary. But the millenium has not been reached, and until it is there is little likelihood of such a system being perfected, for they all embrace machinery of some kind and machinery always requires attention.

Still, notable attempts at a full solution of the problem have been made, and among them, the Rushmore electric starting system, manufactured by the Rushmore Dynamo Works of Plainfield, N. J., probably comes nearer to the real answer, apparent in the elimination of as many parts as possible, than does any other. The generating portion of the system already has been described in Motor World under date of November 7th. Therefore, suffice it to say that the generator is a small, compact ma-

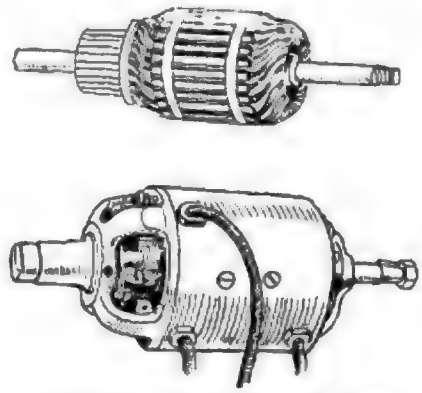


RUSHMORE STARTER SWITCH

chine in which the output is governed by a series coil of iron wire contained in a small "bucking" coil inserted in the field automatically by the increasing resistance of a housing a-top the dynamo casing.

Unusual Disconnecting Method.

The starter is distinctive by reason of the fact that, though it drives the gasolene motor through the intermediary of gearing cut in the flywheel, thus necessitating that a pinion on the motor shaft be enmeshed when the engine is to be started and thrown out of mesh when the motor has started,



RUSHMORE MOTOR COMPONENTS

it is devoid of the usual rods, etc.; its appearance is unusual, as may be judged by the accompanying illustration, which shows both the generator and the motor attached to a heavy Simplex motor. In fact, its construction and its characteristic are so unusual as to make it of more than ordinary interest, particularly inasmuch as it has only just been placed upon the market.

In its simplest aspect, the motor is plain series wound and is completely enclosed so as to make it dirt and moisture proof. The armature is drum-wound, is heavy and is mounted in ball bearings. The peculiar part of the design lies in the construction of the armature and commutator and the method of mounting, both of which features best can made plain by digressing slightly to delve into theory a little.

Characteristics of Series Motors.

It is a well-known fact that the field magnets of any dynamo or motor exert a powerful solenoid action to draw the armature into line with the pole pieces. In fact, this effect is so pronounced that any ordinary motor or dynamo thus will give a silent pull fully as great as can be obtained with the same weight of copper and steel in any other form of simple solenoid or magnet construction. Similarly, it is quite as well known that when the load is removed from a series wound motor it tends to run away with itself and will do so unless restrained by the cessation of the exciting current. It is upon these two simple laws that the Rushmore starter depends for operation.

The shaft and commutator are elongated about 1¼ inches, so that by means of a long coiled spring contained in the hollow front end of the shaft the armature normally is forced out of line with the field poles about 1¼ inches, and thus the one-inch pinion mounted on the end of the armature shaft normally is forced out of mesh with the gearing on the flywheel.

The starting switch, which is quite as important and quite as ingenious as any other part of the mechanism, has three contacts, the arrangement being shown by the accompanying illustration. On the first of them the armature is partly short-circuited. On the first movement of the switch, the circuit is closed to the battery through a resistance step which limits the current flow to 150 amperes at 6 volts. This current all passes through the series motor fields, but, owing to the short circuit across the armature, about half the current is shunted around the brushes. The other half gives the armature a slow but very powerful torque, which is hardly noticeable to the eye but which is practical assurance that the gears will enmesh properly. On the last switch contact, the armature shunt is removed, the series resistance is cut out and with the pinion then in full mesh with the gearing on the flywheel the motor is thrown in full series upon the battery.

As long as the motor is driving the engine, the load current through the series field magnetizes the field so that the armature is held in the working position with the gears enmeshed. At the instant of the first explosion, however, which takes the

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load off the electric motor, it proceeds to run away with the gears still enmeshed. But as quick as a flash, the removal of the load results in the battery current drawn dropping almost to zero, which so reduces the magnetic pull upon the armature that the coiled spring at the end of the shaft forces the gears out of mesh and the armature continues to spin silently at its normal speed of 2,400 revolutions a minute as long as the foot button is depressed. It is doubtful if a simpler starting system could be developed, for there is absolutely nothing to get out of order and, barring the little care that any electric motor requires, it never need be touched from one season's end to the next.

Care of the Motor Made Plain.

As regards the care of the system as a whole, omitting the care of the generator, which already has been outlined, the starting switch should be cleaned occasionally, for it is bound to collect a certain amount of road dust. And even though the dust may not effect the operation of the device, it may contain abrasive particles which in time will cause undue wear. Therefore, it is well periodically, say once a month, to brush out any accumulations of dust. Sliding contact is provided in the switch, thus making the contacts self-cleaning, though if the mechanism is so placed that oil can work in and onto the contacts trouble is likely to ensue. Oil can be removed with a cloth dampened with gasolene. The cover of the case is held in place by means of four screws, one at either corner, and in assembling, care must be taken to see that the lock washers beneath the screws are replaced or the screws will work out under vibration, thus exposing the mechanism.

As the motor is in use only at long intervals and then only for a few moments at a time, wear will be negligible and there is little that will require attention. The brushes should be examined from time to time to make certain that they are the proper length and that they make proper pressure on the commutator, for there are few things which will work greater havoc if permitted to obtain than weakened brush springs or brushes that are so short that they do not properly touch the commutator. Sparking and burning are the result, and the only remedy then is thoroughly to sandpaper the commutator.

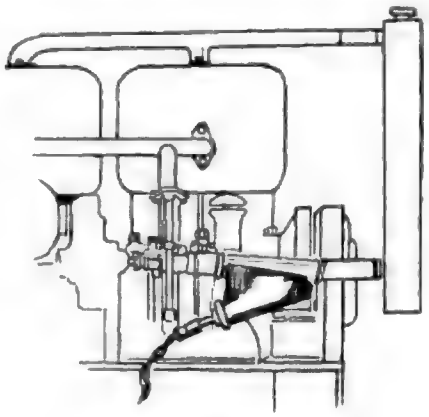
Cleaning the Commutator Surface.

Of course, where the commutator appears unusually dirty, it should be cleaned, a cloth wrapped around the finger and dipped in gasolene being one very good way of tackling the job. If the cleaning reveals deep scratches or cuts on the commutator, these should be removed with fine sandpaper—No. 00—applied while the armature is rotating and after the brushes have been removed.

Where the motor has been run for a long time without any attention whatsoever, it most likely will do more good than harm thoroughly to overhaul it by removing the brushes, and then the opposite end plate, when the armature may be withdrawn, leaving the field open and free for the removal of accumulations of dust, etc. To clean away the dust, a soft brush should be used, care being taken not to disturb the windings. In reassembling, great care must be taken to see that the wires are properly attached, if, for any reason they have been removed. Probably there will be no necessity for removing them, in which case the cleaning operation will be very simple.

To Heat Motors in Cold Garages.

That those who store their cars in unheated garages may not be subjected to the annoyance, to say nothing of the possible expense, of frozen cooling systems, the Dayton Equipment Co., of Dayton, O., has perfected an ingenious type of electric heater for which manifold advantages are claimed. It is styled the Deco-Warmer and is designed to be permanently attached in the cooling system of the motor after the manner shown by the accompanying sketch. In its simplest aspect, it is merely a small electric heater made integral with a short length of piping and attached in such a way that the cooling water passes through the pipe and in doing so comes in contact with the heated surfaces. Energy to generate the necessary heat is obtained from any ordinary electric light circuit, either alternating or direct current being suitable.



DECO WARMER, APPLIED

After the device has been attached, it is merely necessary to screw the plug, which is a part of it, into an electric light circuit; as there are no moving or wearing parts in the device, it is calculated to operate efficiently practically for a life-time. The heater is applicable to any motor, whether thermo-siphon or pump cooled, its effect being to cause a thermo-siphonic circulation in either, thus maintaining all the cooling water warm and facilitating easy starting. Needless to add, it is absolutely fireproof.

"Kerb" Light the Latest in London.

Step lights and extension "trouble hunting" lights are fairly common, and now comes the curb light, or, as it is styled by the British taxicab company that has adopted it, the "kerb" light. It is nothing more or less than an ordinary electric lamp fixed low on the forward axle, but the theory behind the innovation is a little more complicated. Lamps placed in the ordinary position, it is explained, cause an annoying glare in the "blankety" fogs with which London is afflicted, whereas the placing of one lamp—the one ordinarily nearest the driver—on the front axle obviates this trouble and at the same time illuminates the "kerb" to facilitate "landing." The other lamp is placed in the usual position beside the driver, and there has been found nothing in the motor vehicle laws to conflict with the unusual arrangement.

Grain Alcohol for Cooling Solutions.

Although wood alcohol as a medium for lowering the freezing point of water is extremely effective, for which reason it frequently is used in connection with the cooling water of a motor car, its use is not to be recommended, since in the presence of heat and air it forms formic acid, which readily attacks the brass and copper which enter into the construction of the radiator. Pure grain alcohol (ethyl alcohol) is equally as effective as the wood alcohol and is very much less liable to have a corrosive effect.

Springs that Cause Valve Breakage.

A not infrequent cause of excessive valve breakage arises from the use of valve springs which are too heavy. Where a slow speed motor is caused to operate at a speed above normal, stiffer valve springs sometimes are substituted to quicken the return of the valve to its seat and the constant "thud, thud" strains the valve stem to a point where breakage is the natural result. The remedy is the replacement of the heavy springs by lighter ones.

Knock Not Due to the Engine.

A deep toned, heavy knock which sounds for all the world like a connecting rod or a main bearing knock—for it can be perfectly regular and be more in evidence when pulling with high gear in mesh—sometimes is caused by the front engine supporting bearing where three-point suspension is employed. Before dissassembling the motor to look for the knock, it is well to tighten this bearing, making use of a bushing, if necessary.

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1,023,383. Clock for Automobiles and the Like. Henry W. Matalene, New York, N. Y. Filed Dec. 9, 1910. Serial No. 596,431. (Means for actuating the winding mechanism by rotating the dial.) 6 claims.

1,023,393. Fender for Automobiles. Waldo F. Perez, Tampa, Fla. Filed May 15, 1911. Serial No. 627,233. (Basket shaped catcher designed to attach to side frame members.) 2 claims.

1,023,414. Armor for Vehicle Tires. Jeremy B. Coonrod, Rock Rapids, Iowa. Filed Feb. 25, 1911. Serial No. 610,892. (Armor built of solid rubber with metal supports.) 3 claims.

1,023,454. Pneumatic Tire for Vehicle Wheels. Elery Emmerson Black, Detroit, Mich. Filed Mar. 4, 1911. Serial No. 612,243. (Non-resilient base portion to which a resilient tread portion is attached by means of a flange connection.) 2 claims.

1,023,470. Carburetter. Raymond S. Hill and Oliver P. Underwood, Indianola, Iowa; said Underwood assignor to Herman C. Mills, Des Moines, Iowa. Filed Feb. 28, 1910. Serial No. 546,507. (Spray nozzle opening controlled by the air pressure in the mixing chamber.) 4 claims.

1,023,471. Automobile Number Plate. Peter M. Hoffman, Chicago, Ill. Filed July 24, 1911. Serial No. 640,143. (Means for attaching plate to the radiator.) 1 claim.

1,023,487. Differential Gearing. Otto Zachow, Clintonville, Wis., assignor to Four Wheel Drive Auto Company, Clintonville, Wis., a Corporation of Wisconsin. Filed May 8, 1911. Serial No. 625,674. (Means for providing a differential lock.) 4 claims.

1,023,493. Spark Plug. Franz Bartl, New York, N. Y. Filed Nov. 19, 1909. Serial No. 528,875. (Both electrodes covered with insulating and refractory material.) 5 claims.

1,023,516. Pneumatic Wheel. William W. Guest, Alameda, Cal. Filed June 8, 1911. Serial No. 632,014. (Tread formed of many rubber plugs mounted on pistons which operate in dash pots.) 4 claims.

1,023,546. Internal Combustion Engine. Madison F. Bates, Lansing, Mich. Filed June 27, 1910. Serial No. 569,010. (Piston formed in two sections bolted together; the upper section contains the piston rings.) 1 claim.

1,023,552. Dual Ignition System. Richard H. Cunningham, New York, N. Y. Filed Jan. 29, 1910. Serial No. 540,781. (Multiple circuit breaker.) 1 claim.

1,023,553. Change-Speed Gearing. Paul Daimler, Cannstatt, Germany, assignor to Daimler Motoren-Gesellschaft, Stuttgart, Germany. Filed June 13, 1911. Serial No. 632,882. (Clash gear transmission.) 4 claims.

1,023,554. Tire. Milton E. Davis, Canastota, N. Y. Filed June 9, 1910. Serial No. 565,994. (Tire moulded so that a linked netting will fit snugly over the tread.) 8 claims.

1,023,565. Air Pressure Creating Device for Gasolene Supply to Engines, etc. William P. Herbert, Philadelphia, Pa. Filed Mar. 24, 1911. Serial No. 614,594. (Pump incorporated with the valve operating mechanism.) 2 claims.

1,023,580. Anti-Skid Device. Douglas J. Martin, New York, N. Y. Filed Jan. 20, 1911. Serial No. 603,634. (Endless chains attached to each other by means of clamps and means for taking up the slack.) 4 claims.

1,023,598. Vehicle Wheel. Louis K. Stephens, Dallas, Tex. Filed Feb. 20, 1911. Serial No. 609,644. (Spring hub.) 2 claims.

1,023,644. Exhaust Muffler. Joseph Hall, Manchester, England. Filed Nov. 22, 1910. Serial No. 593,743. (Arrangements of baffle plates.) 1 claim.

1,023,666. Cover for Pneumatic Tires. Lucien Liais, Paris, France. Filed Sept. 21, 1910. Serial No. 583,052. (Means of stiffening tire casing.) 3 claims.

1,023,682. Emergency Brake. William Ray Reno, Louisville, Ky. Filed Feb. 16, 1911. Serial No. 608,930. (Runners designed to be dropped before the rear wheels and upon which the wheels run, the runners being chained in position.) 2 claims.

1,023,804. Driving and Steering Mechanism for Power-Operated Vehicles. Iram W. Bould, Pittsburgh, Pa. Filed May 15, 1911. Serial No. 627,135. (Drive shafts can be connected or disconnected from wheels by dog clutches.) 3 claims.

1,023,810. Automobile Steering Guide. Claude Bugg, Clinton, Ky. Filed Sept. 6, 1910. Serial No. 580,476. (Pointer on steering column which indicates the relative angle of the steering wheel.) 3 claims.

1,023,811. Variable-Speed Transmission Mechanism. Leon J. Campbell, Chicago, Ill., assignor to James T. Healy, trustee, Chicago, Ill. Filed June 17, 1911. Serial No. 633,699. (Tilting keys replace orthodox dog clutches on lay shaft.) 10 claims.

1,023,848. Combined Tank Bracket and Step for Motor Vehicles. Russell Huff, Detroit, Mich., assignor, by mesne assignments, to Packard Motor Car Company, Detroit, Mich., a Corporation of Michigan. Filed Oct. 30, 1908. Serial No. 460,301. (Straps attaching to the car frame support both gas tank and steps.) 5 claims.

1,023,859. Vehicle Spring. William S. Lee, Detroit, Mich., assignor, by mesne assignments, to Briggs-Detroiter Company, Detroit, Mich., a Corporation of Michigan. Filed Nov. 24, 1911. Serial No. 662,242. (Platform spring suspension.) 3 claims.



Explaining Casing



TIRE CUTS ruin casings. They admit moisture to the carcass, cause the fabric to rot and weaken, grow larger—end in blowouts.

You can repair **CASINGS** and **INNER TUBES** anywhere in 15 minutes, better than a Repair Shop can do—and for *one cent*.

Universal Auto-Vulcanizer

Patented

A practical vulcanizing outfit complete, with enough repair gum to make 40 patches. It weighs 3 pounds and can be carried in the tool box. **Simplest and most satisfactory device for eliminating tire troubles that has ever been devised.**

Absolutely automatic. Place the patch—attach the Vulcanizer—put in the gasoline light it. No further attention required. In 15 minutes the job is done.

It can't burn, scorch or injure tube or casing. *It can't* get out of order. It *can't* fail to do its work. So simple, anyone can operate it. The Universal Auto-Vulcanizer saves its cost a *hundred times* over in trouble and expense.

Price Complete **$4.00** Ready for Instant Use
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Luxury and Utility

combined in the

National

A woman can step directly from her home into her luxurious National closed car.

She finds it clean, warm and comfortable.

She touches one button to start the motor.

A touch on another button turns on the lights.

The entire mechanism of the car is under her immediate control; she need make no exertion or effort: her gown and coat and hands are not brought into contact with anything that may soil them.

In every way the National should appeal to a woman as being many times superior to an electric.

For her comfort and delight we fit the closed cars with a foot mat, umbrella holder, baggage compartment, speaking tubes, vanity box, mirror, flower vases, etc.

Five Models, Improved Series V, $2750 to $3400

Following are a few of the salient features of National cars:

Long Stroke (4 7-8x6) flexible and noiseless Motor with enclosed valves.

Left-Side Drive.

Center Control.

Gray & Davis Electric Starter, easily operated by simply touching a button with foot.

Gray & Davis Dynamo Electric Lighting System.

Bosch dual double Magneto.

12-inch Turkish Upholstery.

Electric Horn.

Adequate Baggage-carrying Compartment concealed in body but easily accessible.

Tire pump, integral part of the motor. Inflates a tire in three minutes.

128-inch Wheelbase.

Adjustable, ventilating and rain vision Windshield.

Multiple jet Carburetor.

Hoffecker steady-hand Speedometer.

Tire Carrier in rear.

Full-floating Rear Axle.

Easy-riding qualities unexcelled.

The Best Car To Own

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More and more dealers are grasping the sales possibilities of the Warm Hand Wheel, because of its appeal to comfort in winter driving. If you have still held back, then write to us---NOW.

Every car that operates in the winter needs a Warm Hand Wheel as part of its necessary equipment. Every car owner who sees (or rather feels) it demonstrated, will quickly catch the idea and want the wheel.

It isn't an experiment we are offering you, but a tried and proven success, giving uniform comfort to the hands in all winter weather conditions.



Circuit Open

The Warm Hand Wheel is heated by current from the lighting system or from batteries—or from the built in magneto on the fly wheel of the Ford. In all instances current consumption is small and cost of upkeep negligible.

The retail price is $15.00 and we will make a most attractive commission arrangement with you if you will simply write and say,

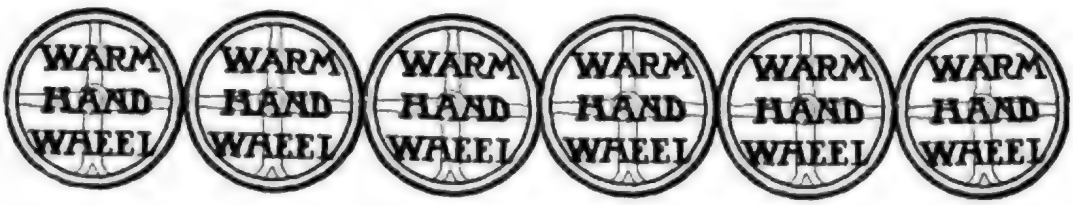


Circuit Closed

"SEND ME YOUR PLAN"

WARM HAND STEERING WHEEL CO.

527 Fifth Avenue *New York, N. Y.*



Storage Batteries at the Chicago Show

OF 242 CARS

Furnished with Electric Lighting and Starting Equipment

185

76 4-10%

Contained

BATTERIES

while the balance, 57 cars, 23 6-10% were divided among five manufacturers. The New York and Chicago Shows combined, show results as follows:

Electrically Equipped Cars—Total of Both Shows

373 Out of 519

71 9-10%

Use Class A Battery with an Electric Lighting Generator
Use Class B Battery with an Electric Self-Starter

Write us for full information

Willard Storage Battery Company

CLEVELAND, OHIO

New York Branch—136 West 52d Street
Detroit Branch—1191 Woodward Avenue
Chicago Branch—2241 Michigan Avenue
San Francisco Branch—243 Monadnock Bldg.

Depots in All Principal Cities in the United States, Canada and Mexico

Digitized by Google

The Motorcycle Field

is growing by leaps and bounds and motorcyclists are good spenders for

ACCESSORIES

This promising field is splendidly covered by the

Bicycling World and Motorcycle Review

The Oldest Cycling Journal in the Country

Attention is called to the fact that many manufacturers of automobile accessories can greatly widen their field by cultivating the motorcycling industry and to those who are not already familiar with the enormous volume of business now being done in motorcycles the facts will be a revelation.

The Bicycling World and Motorcycle Review is ready to tell you how you can reach this field at a minimum expense, and its service department will plan a campaign for you; prepare advertising copy and insure its circulation in every state.

If you make anything for motorcyclists
SEND YOUR CATALOG
for our file as we have continual inquiries concerning accessories and we want to be in a position to give complete information.

WRITE FOR PARTICULARS

Bicycling World Co.
1600 Broadway **New York**

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AN INTERESTING PROPOSITION

Generous Profits for Live Dealers

DEALERS—ANSWER THESE QUESTIONS:

Which Truck will give the most satisfaction to my customer?

The truck which is built to perform the service expected of it, and which possesses exclusive points of economy and superiority.

The A&R Motor truck represents accumulated results of eight years careful study and scientific development with the most severe road tests. Through these tests, it has been demonstrated that the A&R truck is more than capable of meeting every possible condition.

A&R CONSTRUCTION

"Study the lines": —They represent power and efficiency — far in excess of their rated load capacities, combined with minimum weight and great strength. Many features of the A&R truck are exclusive—collectively they represent the highest type of motor vehicle construction.

CAPACITY

Heavy service—three, four and five tons.

The demand for high grade motor trucks, already exists and will be further stimulated by our advertising assistance, and co-operation with the dealer. Write now telegraph us now for more complete information.

Which Company will give me the best co-operation, not only in the sale, but in rendering service to my customer?

The Company which is firmly and substantially established; thereby assuring permanence, situated to render service to owner and dealer, and willing to co-operate with him in compelling attention and consideration for the truck through publicity.

The Abendroth & Root Manufacturing Company, is an engineering corporation, whose products have been recognized standards throughout the engineering world for over forty-five years, thereby insuring sterling quality and dependable service for every A&R truck.

A&R SERVICE

A thoroughly equipped factory at Newburgh, N.Y., in close proximity to New York City, has a factory service department, where the most efficient co-operation is available to every dealer and purchaser of an A&R truck.



Abendroth & Root Manufacturing Co.

48 Church Street,
New York City

FACTORY: NEWBURGH, N. Y.

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An Old and Well-Known Trade Mark
The Best Product
An Efficient Organization



INVADER OIL



¶ The Invader name and trademark has been known to the trade ever since the automobile was a baby.

¶ It has always stood for the highest quality that could be produced.

¶ The Invader Oil Company is composed of men who have succeeded in the oil business and who know it thoroughly.

¶ What further assurance is it possible to give that Invader Oils are the best for the owner to use and easiest for the dealer to sell?

INVADER OIL CO., 80 Broad Street, New York

PHILADELPHIA
113 Arch Street

BOSTON
284 Columbus Avenue

WASHINGTON
3556 11th Street, N. W.

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Livingston



Greatest Cooling Efficiency

Cant be Hurt by Freezing

IF you or your customers are troubled with boiling radiators or overheated motors, the chances are you need our assistance.

Livingston Radiators are so highly efficient in the performance of their cooling functions that their substitution nearly always means the elimination of heating troubles and considerable increase in engine power and car economies.

An overheated motor spells ultimate ruin as well as continuous expensive operating cost and upkeep. Enough actual cash can be saved in operating expenses (to say nothing of the increased life of the car) by the use of Livingston Radiators to warrant the additional expense entailed in their purchase.

If you would like more details, get in touch with us immediately.

LIVINGSTON RADIATOR & MANUFACTURING CO.

RANDALL BUILDING, 52d STREET, NEW YORK

All types of radiators built, rebuilt and repaired.
We build individual radiators for car owners.

Radiator

THE LARGEST AUTO SUPPLY HOUSE IN AMERICA

Our Name Is Your Guarantee

WHATEVER you buy from the house of CHAS. E. MILLER you may expect the fullest degree of satisfaction in every detail. Quality, quantity, material, workmanship, durability will be just right or we will make it right. Our name is your guarantee.

To buy from a house the size and standing of this one is the safest way to insure complete satisfaction in all your dealings. We handle goods of **standard quality only** and of course stand back of everything we sell.

No matter what you want in the line of automobile accessories or supplies, remember our slogan, "We Either CARRY IT IN STOCK, WILL GET IT—OR IT ISN'T MADE." One of the prize winners in MOTOR'S recent advertising contest selected this as the slogan out of the many shown. His reason was as follows: "This saying is the clearest possible statement of the Miller business policy which I have found to be a fact through several years of satisfactory relations with them."

Our Annual Catalog is the largest, most complete, up-to-date and authoritative dictionary of the auto supply market of any book published. It has come to be recognized as one of the standard reference works of the industry.

The total distribution of one hundred thousand copies of this catalog practically covers the world, at least wherever automobiles are used. Nearly all foreign as well as domestic automobile manufacturers and dealers, the offices of American Consuls, Public Libraries, Universities, Y. M. C. A. Schools, Publishers, Automobile Clubs, Engineers' Offices, Purchasing Departments—in all these places you will find a copy of the Miller catalog on file.

Fifteen branches spread over the United States, located in the principal motoring centers, bring Miller service within the reach of practically every motorist in the United States. Prompt delivery, perfect quality, honest prices—these are the things that distinguish Miller service and explain the marvelous growth of this pioneer establishment since its inception in 1896.

CATALOG MAILED TO ANY ONE ANY PLACE ON REQUEST

Chas. E. Miller

Manufacturer, Jobber, Exporter and Importer

ESTABLISHED 1896

Home Office: 97-99-101-103 Reade Street, New York City

ORDER FROM NEAREST BRANCH, ADDRESS CHAS. E. MILLER

NEW YORK CITY 97-103 Reade St.	BROOKLYN, N. Y. 1421 Bedford Avenue	BOSTON, MASS. 202-204 Columbus Ave.	DETROIT, MICH. 227-229 Jefferson Ave.	ATLANTA, GA. 250 Peachtree Street
NEW YORK CITY 924 Eighth Avenue	BUFFALO, N. Y. 824 Main Street	SPRINGFIELD, MASS. Bridge and Dwight Sts.	CLEVELAND, O. 1329 Euclid Avenue	NEW ORLEANS, LA. 601-603 Baronne St.
NEW YORK CITY 2782 Broadway	ALBANY, N. Y. 135 Central Avenue	HARTFORD, CONN. 274 Trumbull St.	PHILADELPHIA, PA. 318 North Broad St.	NEWARK, N. J. 274 Halsey Street

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Knox

MARTIN TRACTOR



Maximum Carrying Capacity
Minimum First Cost
Minimum Maintenance
Minimum Turning Radius

What It Is

Not a Theory But a Proven Success in a Year's Gruelling Work. Many in Successful Operation. 5 to 10 Ton Capacity. Full Details Explained in Tractor Catalog. Send Today.

A motor unit that may be attached to any heavy vehicle designed to be drawn by horses; the combination making a five-wheeled motor-drawn vehicle.

IT SAVES HEAVY MAINTENANCE CHARGES DUE TO EXCESSIVE COST OF RUBBER TIRES. Wagons have been doing good work for many years on steel tires and there is no reason why they will not continue to do so when drawn by the tractor; the heaviest part of the load is always carried on steel tires.

IT SAVES HEAVY MAINTENANCE CHARGES DUE TO EXCESSIVE VIBRATION ON STIFF SPRINGS. All working parts of the tractor are carried on springs as resilient as those of a pleasure car.

IT SAVES HEAVY MAINTENANCE CHARGES DUE TO SUDDEN STARTING OR STOPPING OF HEAVY LOADS. The cushioning of the shock between the engine and the load is one of the most important advantages gained, (fully explained in catalog).

IT SAVES HEAVY MAINTENANCE CHARGES DUE TO NEGLECT ON ACCOUNT OF INACCESSIBILITY OF PARTS—all parts of the tractor being more accessible than on a touring car.

IT SAVES HEAVY MAINTENANCE CHARGES due to frame twist. The tractor accommodates itself to all road unevenness.

The single front wheel can be turned at 80 degrees angle, enabling the driver to back to any position or turn completely around in a narrow street.

Send for further information and prices

KNOX AUTOMOBILE COMPANY (Tractor Department) Springfield, Mass.

BRANCHES—New York, Chicago

AGENTS—The Knox Martin Tractor Is the Greatest Proposition in the Commercial Field Today. Fully Protected by Patents.

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HOFFECKER SPEEDOMETERS

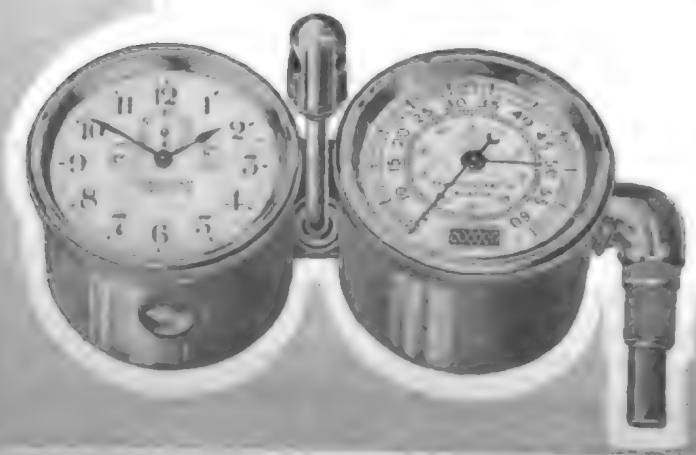
HOFFECKER IS TO A SPEEDOMETER WHAT WALTHAM IS TO A TIMEPIECE



Write to your car manufacturer—tell him to equip the cars you sell with Hoffecker Speedometers and Waltham Time Pieces—then you are selling another important item of service.

Hoffecker is to a speedometer what Waltham is to a time piece—both names stand for quality of product known and used wherever cars are found.

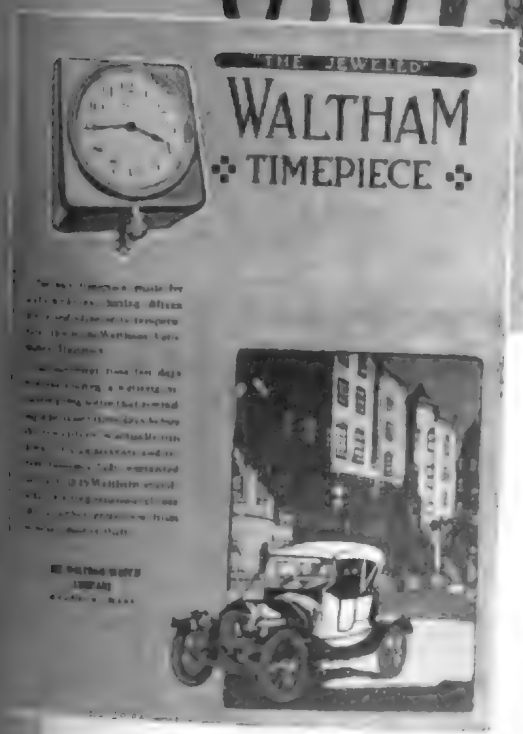
You cannot find better instruments anywhere at any price—and the fact that we can sell this combination to manufacturers at moderate cost emphasizes this argument.



You can judge Hoffecker-Waltham worth by cost of production. These instruments are turned out in factories where design, material and workmanship are paid for on a scale commensurate with our ideals—and they are high.

WALTHAM TIMEPIECES

HOFFECKER IS TO A SPEEDOMETER WHAT WALTHAM IS TO A TIMEPIECE



We subordinate selling cost (which is overhead) to cost of production, and to do this we concentrate our advertising in a group of publications that reach prospective car owners and owners only. A sample two-page spread of this advertising is shown here.

You, as a dealer, get the benefit of this advertising—it reaches the people to whom you sell cars and accessories.

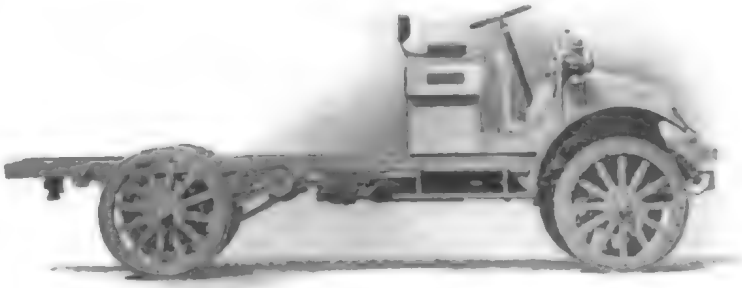
The car manufacturer gets the money we save (through economical, effective advertising) in the shape of the highest grade instruments at prices he can well afford to pay.

Again we say:

If you want to help your prospective car owner to exceptional speed and time recording service, then specify Hoffecker Speedometers and Waltham Time Pieces.



KELLY MOTOR TRUCKS SELL



YOUR PROFITS

$ You can make money selling motor trucks.

$ You can finish each season with increasing profits.

$ To do so take advantage of these fundamentals:

(1) You must have good trucks to sell—and good selling trucks.

(2) You must be supported by an ORGANIZATION which will co-operate with you to give 100 per cent. truck efficiency to the user—that's Kelly service.

(3) You must have the benefit of working with a factory sales department which has but one object—the sale of Kelly Trucks for you. This means aggressive advertising, intelligent publicity and direct sales co-operation.

Sixteen Page Insert in t
Tells the Story.-If y
Us for a Copy.-The

$ In your community we will create a demand for Kelly Trucks, and if you are the dealer with the big brains WIRE IMMEDIATELY AT OUR EXPENSE.

KELLY SERVICE

The final test of the efficiency of a motor truck is service. The sale of a truck is only the beginning of the manufacturer's responsibility.

Do you realize what real factory service means to the man who sells a truck?

Kelly service is legitimate service in every sense of the word.

We can give real service because we have built up the Kelly organization with that idea in view.

We operate well-equipped factory branches and service stations in the following cities:

Boston	Dallas	Birmingham
Providence	San Francisco	Chicago
Worcester	New York	Kansas City
New Haven	Philadelphia	Seattle
Cleveland		Los Angeles

Digitized by Google

WHEREVER TRUCKS ARE SOLD

Every city and town in the country is within a few hours of one of these service stations. The necessary equipment for any repairs can be dispatched to any dealer without an instant's delay, and delivered within a few hours. The advantage of this arrangement can be seen readily by those who have often been compelled to wait many days for the arrival of repair parts from a distant factory.

KELLY SALES HELPS

Our sales and advertising department is designed primarily to sell Kelly trucks for you. We will help you in every way possible.

A large sum of money will be spent in advertising and sales promotion work in 1913. We will employ every legitimate means to promote your sales.

Weeks Motor World Didn't see it send to Wire for Territory

Every member of our sales and advertising department has had long experience in selling. They know how to help you sell trucks—they can sell them for you.

We will co-operate with you in every way possible.

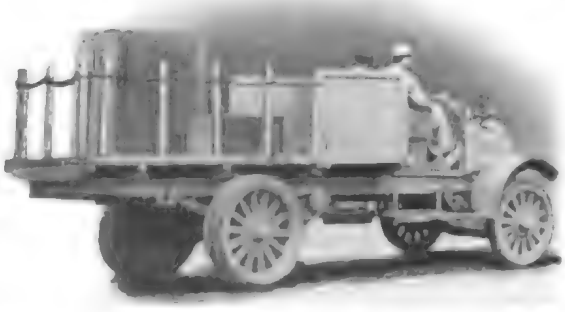
THE LAST WORD

In conclusion we urge upon you the importance of telegraphing at our expense if you, as THE live Dealer, want the best motor truck account in America.

We are prepared to go the limit with you to get the cream of the motor truck business in your territory.

Don't wait to see us for the Chicago or any other motor truck show.

Telegraph immediately at our expense and arrange to have territory assigned you.

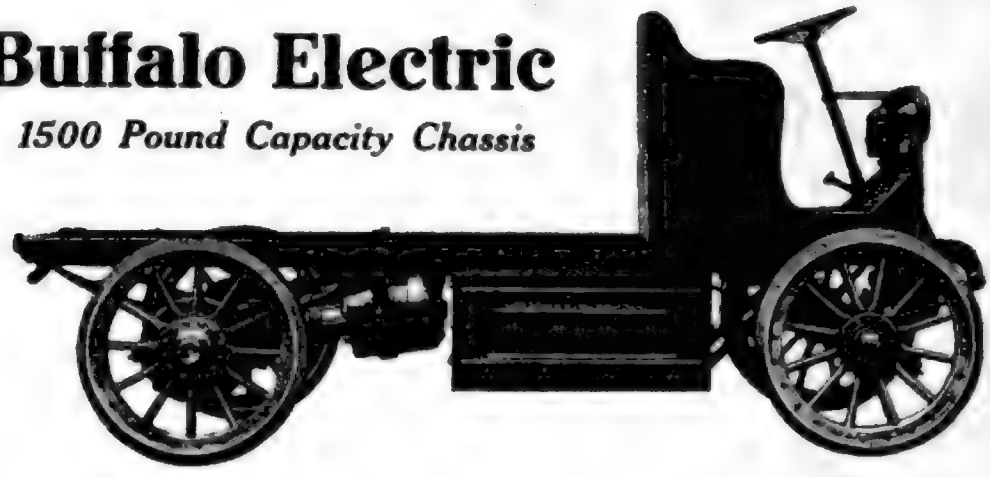


THE KELLY-SPRINGFIELD MOTOR TRUCK COMPANY

1026 Burt Street Springfield, Ohio

Buffalo Electric

1500 Pound Capacity Chassis



Announcement of Buffalo Electric Light Duty Trucks

The most satisfactory solution of light trucking requirements is found in Buffalo Electric Shaft Drive Commercial Cars.

1500 lbs. capacity chassis.

2000 lbs. capacity chassis.

The Buffalo Electric type Direct Shaft Drive is the most efficient and reliable light truck transmission yet developed. Every day performance of any truck depends upon the efficiency of its transmission.

We direct your attention to the Buffalo Electric universally suspended motor, the gear connection between motor and drive shaft, the drive and rear axle mechanism.

Approved electric truck standards have been developed and refined to meet the requirements of such classes of business as trucks of this kind can best serve.

Every element in the make-up of these trucks provides for generous overload.

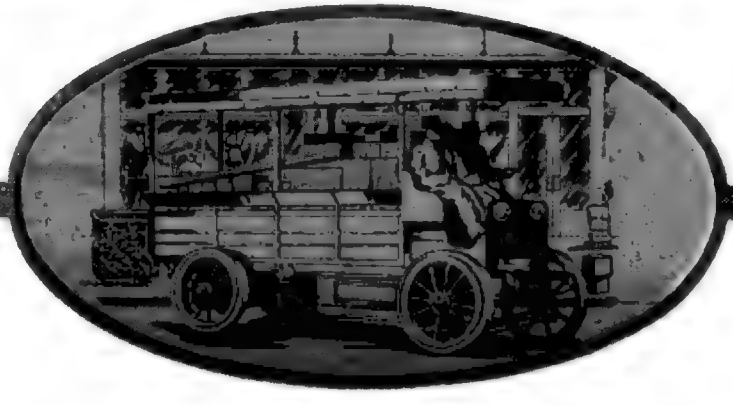
Buffalo Electric Light Duty Trucks make their first bid for the endorsement of dealers and business men at the Chicago Truck Show—February 10th to 15th.

Every dealer should visit the Buffalo Electric Truck exhibit at the Chicago Show. Dealers who are unable to attend the Show can have descriptive folder for the asking.

BUFFALO ELECTRIC VEHICLE COMPANY

Factory and General Offices: 1222 Main Street, Buffalo, N. Y.

Space A Coliseum



Chicago Truck Show

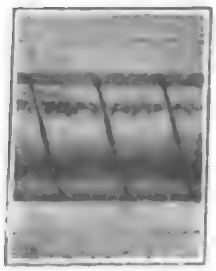
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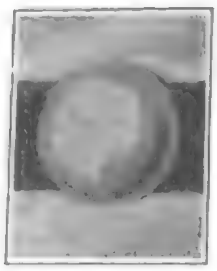
Another Prominent User of HYATT ROLLER BEARINGS



MR. DON M. FERGUSON, Chief Engineer Cartercar Co.

Hyatt Quiet Bearings





LINE CONTACT is the basic principle of the Roller Bearing as against Point Contact of the Ball. There results a vastly increased surface to support the load, reducing the duty per unit section of the operating parts and increasing their life in a like proportion.

To insure this condition, uniform distribution of load is essential. This necessitates perfection in the manufacture and mounting of the bearing. Perfection is unattainable under manufacturing conditions.

The flexibility of the Hyatt Roller absolutely insures full line contact, hence guarantees uniform distribution of the load.

Flexibility is an exclusive feature of the Hyatt Roller.

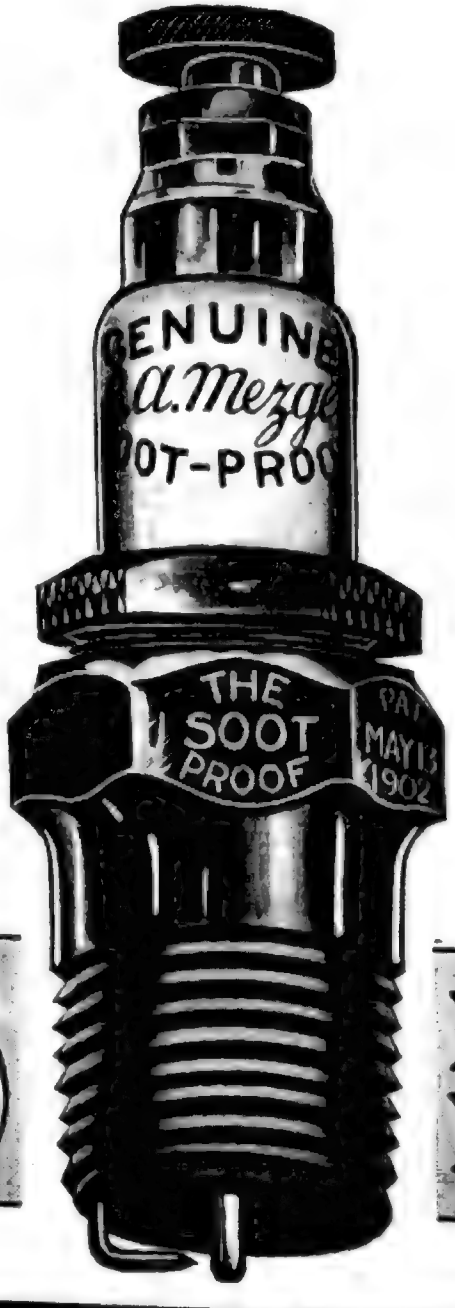
HYATT ROLLER BEARING CO.
DETROIT, MICHIGAN

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C. A. Mezger

"SOOT PROOF" SPARK PLUGS

We are advertising **Mezger Soot Proof Spark Plugs** in the leading automobile and motor boat journals.



We are using pages and double pages—and running until every car and boat owner will **be wise enough to buy Mezger Soot Proof Plugs.**

DEALERS

Read the Big Message

Digitized by Google



How About Dead Stock in Spark Plugs?



You may have such a losing investment—Plenty of dealers have. It's the logical result of defective products—many brands that do not give service, even if you do sell them on the maker's word.

DEALERS—We are going to help you sell Mezger Soot Proof Spark Plugs by giving your trade the best plug on the market—and by giving you advertising service on a scale never attempted by any manufacturer in this line.

Mezger Soot Proof Spark Plugs are made by one of the oldest spark plug makers in America.

They have stood the test of years—long, hard and consistent service.

Through their self advertising they have multiplied into

Millions Now In Service

and they are giving perfect satisfaction to tens of thousands of motorists—simply because they cannot short circuit, leak or break down.

Your trade can pay more for Spark Plugs, but no matter what the price, they cannot buy more uninterrupted service or longer life.

We are going to prove that it will be to your advantage to handle Mezger Soot Proof Spark Plugs exclusively.

Write today for our proposition. Get our booklet telling why these plugs have made and held a reputation second to none.

C. A. MEZGER, Inc., 15 Canal Place, New York

Warner
AUTO-METER
(MAGNETIC PRINCIPLE)

SPEEDOMETER preference has become so pronounced and one sided that now you rarely find a high grade car that is not equipped with a Warner.

Warner Service Stations are permanently maintained in all large cities. Warner owners are thus assured of permanent satisfaction.

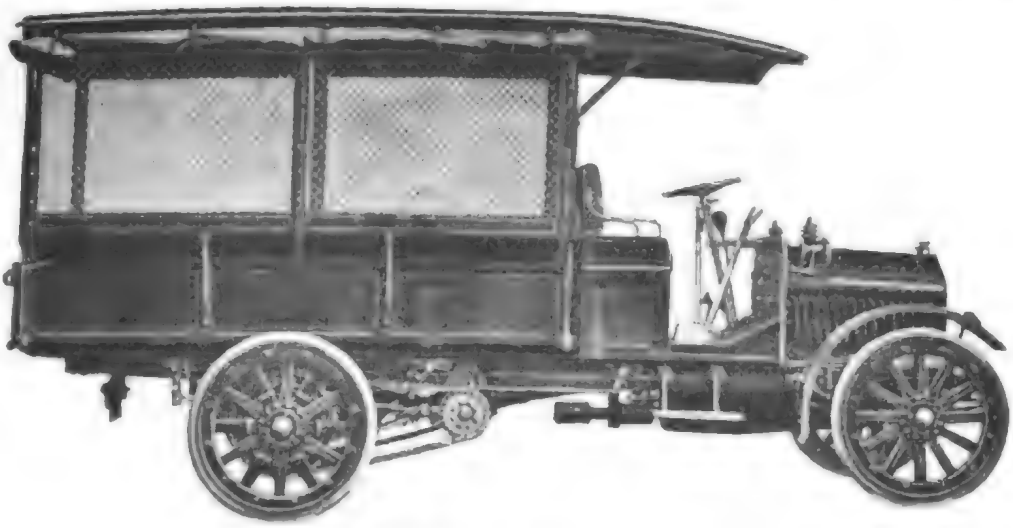
Warner Auto-Meter Factory
Beloit



Model O-2
Price $145

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SELDEN ONE-TON TRUCK



$2000

HAS SET A NEW STANDARD FOR COMMERCIAL CARS

It represents a greater cash value than any other one-ton truck. It is built for hard service and embodies every feature that stands for Durability and Economy—the two chief requisites of an efficient business vehicle.

THE BEST AGENCY PROPOSITION EVER OFFERED

The Selden Sales Plan puts the Selden Truck within reach of thousands of merchants and manufacturers who cannot conveniently buy on a cash basis.

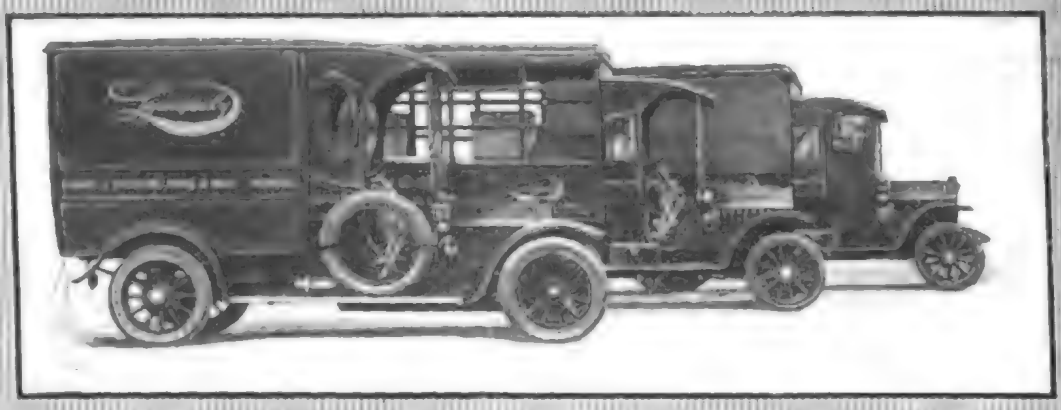
Some Valuable Territory Open

Write at once for Sales Plans, stating territory desired and giving sales and service facilities.

SELDEN TRUCK SALES COMPANY

183 East Avenue, ROCHESTER, N. Y.

KISSELKAR TRUCKS



Why Business Men Believe in KisselKar Trucks

THERE is scarcely a business in which KisselKar Trucks are not used and praised. A superior truck—strong and sturdy—best adapted to grilling service—**that's** why. Materials zealously selected--construction carefully inspected—chassis rigidly tested **and testers double checked.** That's the Kissel way.

KisselKar Trucks are built in seven sizes—1,500 lbs., 1 ton, 1¼ ton, 2 ton, 3 ton, 4 ton and 5 ton carrying capacity.

The two smaller sizes have 30 H.P. motors, the 1¼ ton, 36 H.P., the 2 and 3 ton, 40 H.P., and the three larger, 50 H.P.—all long stroke.

Characteristics of all but the two smaller sizes of KisselKar Trucks that contribute to their superiority are four speed transmission (direct on third—fourth geared up) and a differential lock which throws traction to both rear wheels—positive insurance against stalling.

Liberal dimensions throughout—extra large axles, wheelbases and tires. Frames of pressed or channel steel. Gears and other vital chassis parts vanadiumized.

***KisselKar Service** adds inestimable value to a KisselKar Truck. Our own buildings and factory trained men at all principal points relieve owners of mechanical trouble—keep the truck in prime condition and minimize depreciation.*

Write for new truck catalog.

Kissel-Kar Exhibit—Chicago Show—Section C Coliseum

Kissel Motor Car Company, 159 Kissel Avenue, Hartford, Wis.

BOSTON NEW YORK CHICAGO MILWAUKEE KANSAS CITY LOS ANGELES MINNEAPOLIS ST. PAUL DALLAS

Philadelphia, Pittsburgh, Detroit, El Paso, New Orleans, Baltimore, Rochester, San Francisco, Seattle, Portland, Spokane, Duluth, Buffalo, Hartford, Conn., New Haven, Albany, Troy, Montreal, Quebec, Toronto, Winnipeg, and 200 other principal points throughout America.

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Lancia
Dealers Make Good

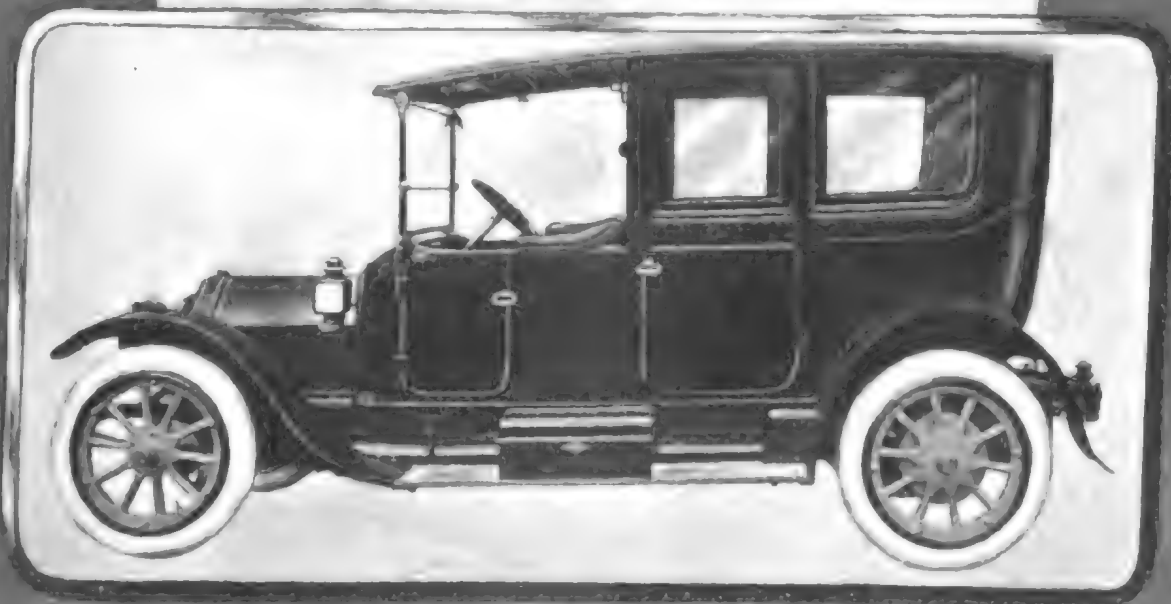
In handling the Lancia, the dealer automatically creates an exclusive and most desirable selling connection—and the fact that he may be surrounded by many American agencies lends still *more* prestige to his own proposition.

You, Mr. Dealer, can sell Europe's most exclusive product at American prices and you can, on this basis, offer Lancia cars and equipment to those who are fastidious not only in regard to rakish, unusual European design, but who also understand the actual service value of a car made in Europe, where steel making is an exact science and where engineering genius of the world has reached the high water mark.

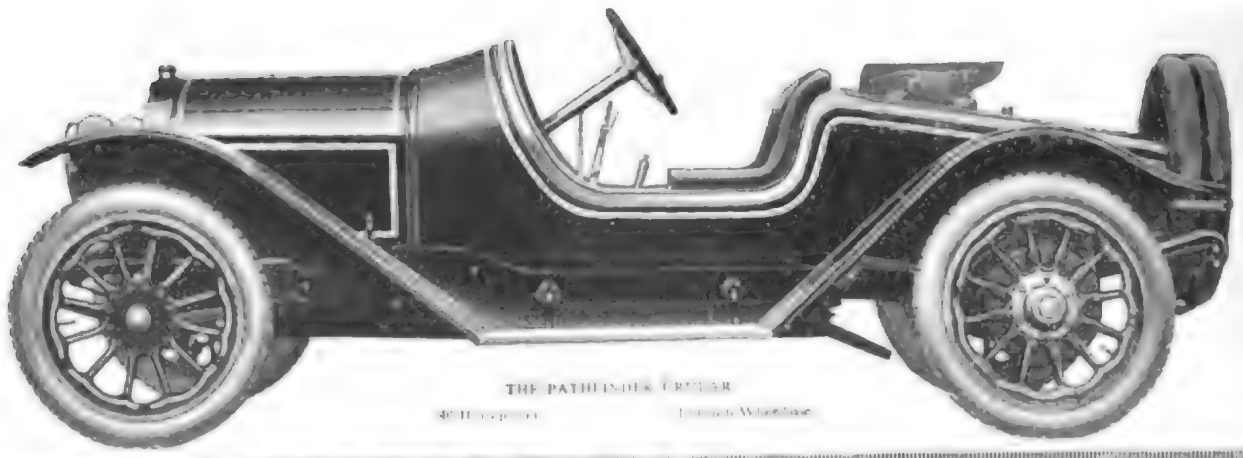
Canvass your list of prospects—you can interest plenty of them in a very unusual and distinctive type of motor car, with racing and endurance records back of it that are beyond cavil.

We await your inquiry and we promise our selling co-operation.

ADAMS-LANCIA CO.
235 West 58th St., New York



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PATHFINDER

Official good roads car
Sensation of the shows

THE PATHFINDER represents the most notable engineering achievements in the building of motor cars. The Pathfinder *chassis* has been pronounced the greatest advance in scientific construction.

The Pathfinder electric *self-starter* is simple and accessible—it appeals to the man who is "car-wise" because it is easily operated and does not complicate ignition.

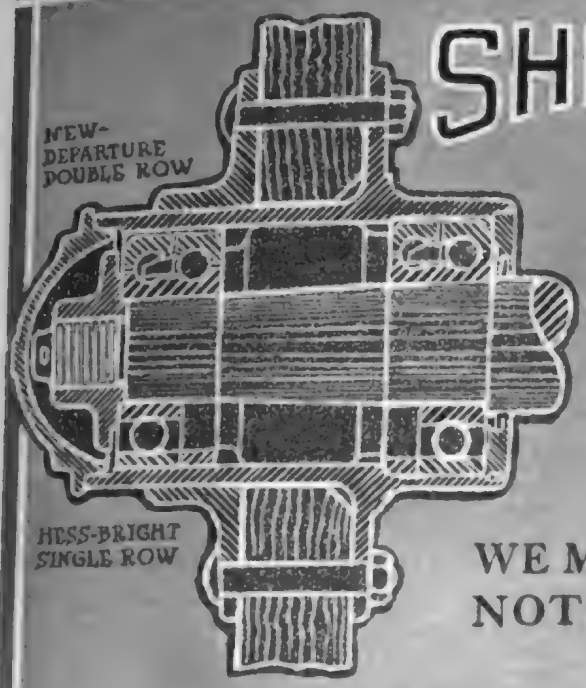
Our "101 Reasons" will help you to judge the efficiency of any good car. Write for them.

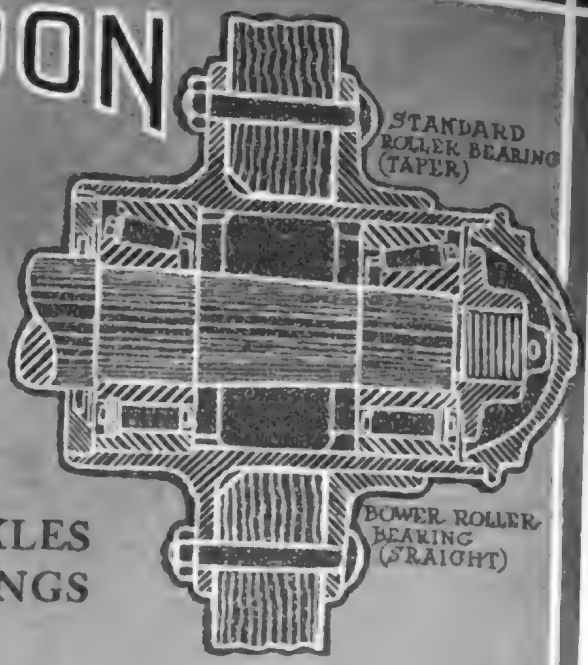
Factory Address
THE MOTOR CAR MFG. CO.
Indianapolis, U. S. A.

Chicago **New York**

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SHELDON





WE MAKE AXLES NOT BEARINGS

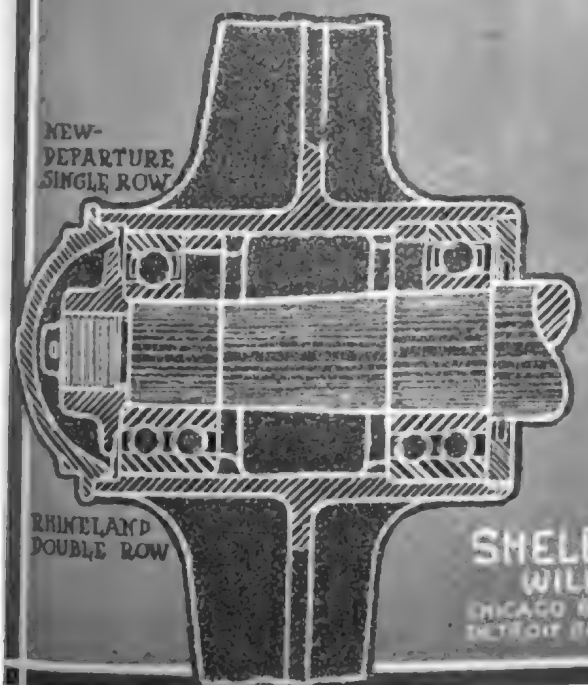
Manufacturers purchasing Sheldon Axles to-day, are offered a completeness of equipment which exceeds anything previously known to the motoring industry.

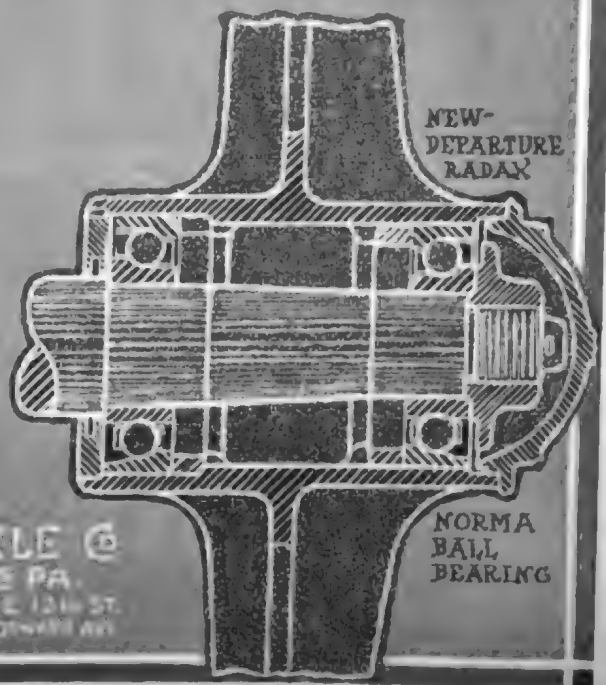
Our new axles are equipped for wooden or steel wheels with your choice of the following high class bearings:

New Departure Double Row
Hess-Bright Single Row
Standard Taper Roller Bearing
Bower Roller Bearing (straight)
New Departure Single Row
Rhineland Double Row
New Departure Radax and Norma Ball Bearings

We do not offer our axles as a means of selling bearings because we are distinctly axle manufacturers. We offer car makers their choice of all the best bearings that can be made—domestic or foreign—simply that the rest of the equipment may conform to Sheldon superiority.

Surely no car equipped with Sheldon Axles and a choice of any of the bearings mentioned on this page will be lacking in quality.





SHELDON AXLE &
WILKES-BARRE PA.
CHICAGO BRANCH 60 E. 13th ST.
DETROIT BRANCH 715 WOODWARD AVE.

Studebaker

You Can Sell a Studebaker "35" for $1290 as Easily as You Could Sell Dollar Bills for Eighty Cents

Because — A Studebaker "35" is —

Electrically started, electrically lighted.

Carries six passengers—*two* in rear seat, *two* in folding seats, *two* in front seat, no crowding, solid comfort.

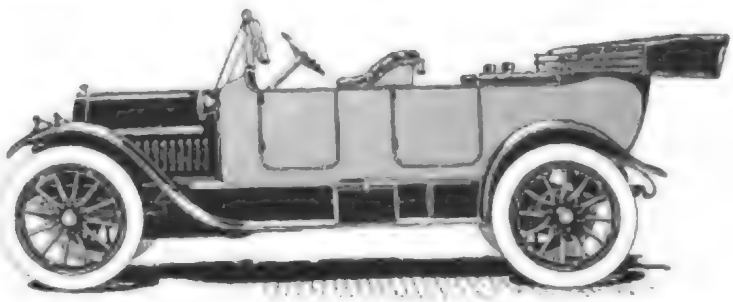
Equipped with the last details of luxury and comfort—never before realized in a moderate priced car.

Upholstery of hand buffed leather, richly tufted, deep cushions, the entire design from crowned fenders to swell of body, the embodiment of luxurious good taste.

Mechanically perfect—116 inch wheel base, 4 cylinders, 4 1-8 inch bore x 5 inch stroke motor, three-quarter elliptic rear springs, full floating rear axle, detachable demountable rims, 34 x 4 inch Goodrich tires, clear vision ventilating windshield, rain vision type.

A car you'll be proud to exhibit in any company.

And—the Studebaker name plate insures courteous and instant service to a customer in whatever part of the country he may be.



Studebaker "35"

STUDEBAKER CARS

"20" Delivery Car	$800	"30" Touring Car	$1190	"Six" Touring Car	$1550
"20" Roadster	835	"35" Touring Car	1290	"Six" Roadster	1550
"25" Touring Car	885	"35" Sedan Type	2050	"Six" Limousine	2500
		"35" Coupe	1850		

All prices for cars fully equipped F. O. B. Detroit

THE STUDEBAKER CORPORATION

DETROIT, MICH.

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DEALERS—

Out of EUROPE Comes The Aristocratic

METALLURGIQUE

The Car You Can Sell to Men of Means and Fine Discrimination

¶ Are you in a position to locate and interest men of means, social standing and ability to recognize a car of impressive individuality, tremendous prestige and sterling performance.

¶ If so, we will use our sales organization to assist you in selling the Metallurgique, Europe's most talked of car and the one most sought after.

¶ This automobile is the product of fifty years steel making near Brussels, the Pittsburgh of Europe. In materials, it stands alone in quality. Its chassis is a revelation in construction that has given it a proven title, "The unbreakable car." In body design it is a model of sensational European originality that causes even the blase New Yorker to turn to admire.

¶ Metallurgique dealers have as sales ammunition a list of owners that reads like the International Social Register. Write for our beautiful brochure—it will introduce us.

METALLURGIQUE MOTOR CO., 1934 Broadway, New York

W. C. & H. N. ALLEN, Proprietors

TO OWNERS *of* CONTINENTAL

RIMS  RIMS

THE RIM BASE OF *STANWELD*

RIM No. 30

Will Fit the Felloe Band of Either the Continental or Standard Universal No. 3 Rim

SEE OPPOSITE PAGE

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Rim Base of STANWELD Rim No. 30 With Tire Applied

IF your car is equipped with Continental or Standard Universal No. 3 Demountable rims, you can completely re-equip with No. 30 STANWELD Rims in less than one hour and with very little expense.

All that you need are the No. 30 rim bases. They fit perfectly the felloe band of either of the above mentioned types and can be applied without the necessity of any special wheel work or the addition of any bolts, wedges or special tools.

Merely remove your old tire rims from the wheels, apply your tires to the new rims, replace the rim with tire on the wheel, screw up your wedges and you have a complete set of new rims.

STANWELD Rim No. 30 is a vast improvement over all former similar types. It is operated without a special tool. Rust and freezing cannot interfere with its operation. Circumferential movement of either section is not necessary to detach a tire.



Merely open a small swinging latch with a screw driver, pry loose the ends of the two flat semi-circular spring rings which fit over corresponding lugs of both sections. The two sections of the rim base can then be separated for removal of the casing or tire. The locking rings can be replaced with the fingers in a very short time.

All the old difficulties experienced with the other types are completely eliminated. The rim itself is light, strong, extremely simple and easy to operate. The expense involved is so low that the oldest car can economically be re-equipped with the No. 30 STANWELD rim, provided its former equipment was either Continental or Standard Universal No. 3 rims.

Write to us, giving the present size of your rims and we shall furnish you with a descriptive folder giving prices. This is absolutely the best rim offer that has been made to the motoring public for many years.

THE STANDARD WELDING COMPANY

CLEVELAND, OHIO

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Your Name on the Spring Bolt

Makes it a Distinctive Part of the Car

Here is a bolt designed and manufactured with such care that you can put your name on it and stand back of it.

It will show that you are giving this important bearing the attention it deserves.



The system of lubrication is perfect. The grease cup is of extra large capacity and the grease ducts of ample size.

The fresh grease, forced into the bearing at the middle, spreads over the entire surface of the bolt. It not only lubricates it thoroughly but pushes out the grit, dirt and old grease at both ends leaving the bearing clean.

The bolt is made of open-hearth steel. Scientific heat treatments carbonize and harden the body producing a bearing surface which resists the cutting action of the mud and grit.

A tough, silky core is retained by this treatment making a bolt that stands the road shock and strain.

These bolts are furnished with your name stamped on the grease cup as shown above.

Send blue prints for quotation

The Electric Welding Products Company

CLEVELAND, OHIO

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Bosch Plugs

AS GOOD AS BOSCH MAGNETOS

EXTENSIVE investigations into the problems of ignition have made possible the production of a better plug, a scientific plug, a Bosch Plug: one having all those attributes that characterize Bosch Magnetos as the standard ignition source of the world, all those qualities which have caused Bosch to be fitted to the most excellent examples of automobile construction such as the Peerless, Packard, Pierce-Arrow, Mercedes, Fiat, De Dion, etc.

This is a reason why you should insist upon having Bosch Plugs in your engine. They complete the perfect ignition system

Bosch Plugs $1.00 Each Everywhere

BOSCH MAGNETOS WITH BOSCH PLUGS

Specify them or from your Dealer

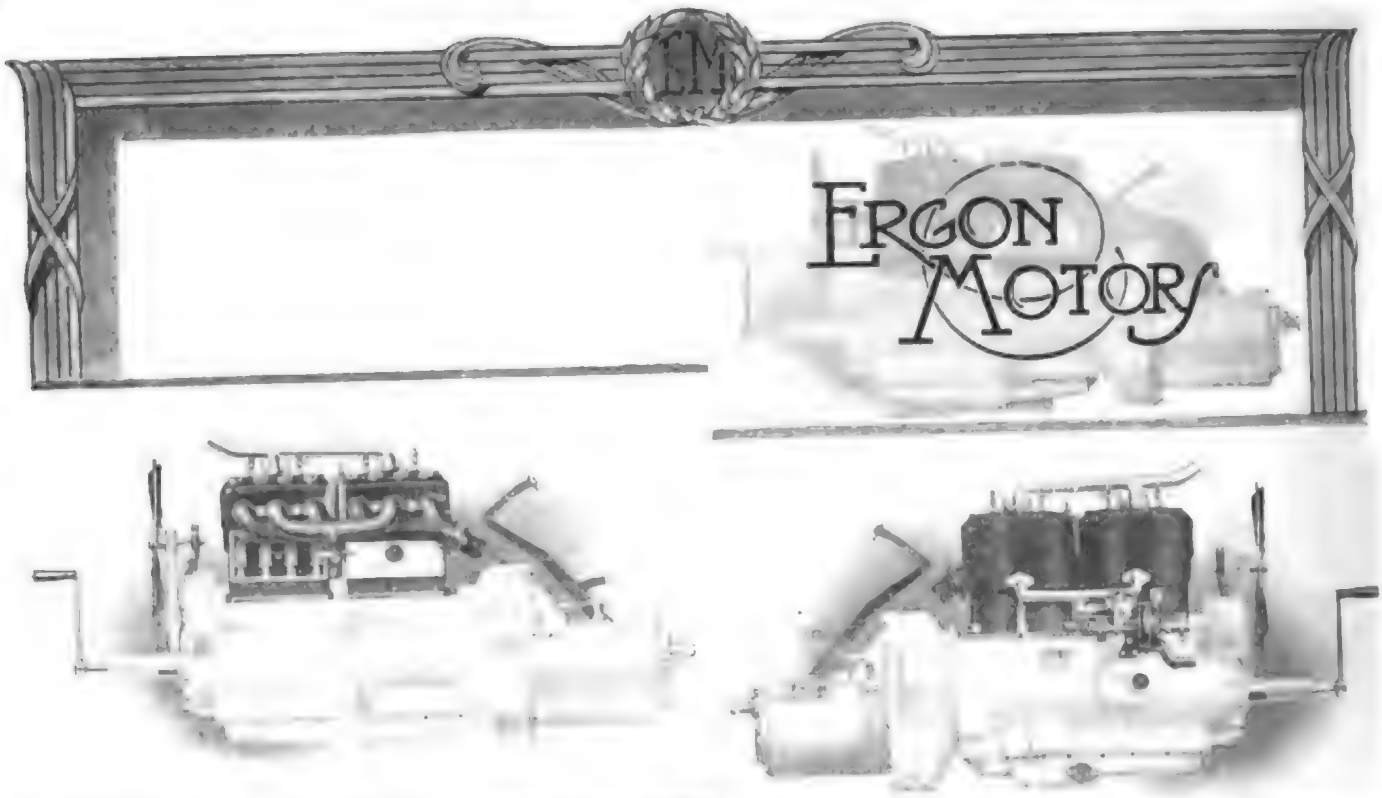
Be sure to obtain "Locating the Spark Plug"; it's gratis to you if you'll write

BOSCH MAGNETO CO., 224 W. 46th St., NEW YORK

Chicago :: :: Detroit :: :: San Francisco :: :: Toronto

Official Distributors PORTLAND, ME., Maine Motor Car Co.; BOSTON, Motor Parts Co.; BUFFALO, Jas. G. Barclay, Inc.; ROCHESTER, A. M. Zimbrich; PHILADELPHIA, Motor Parts Co.; PITTSBURGH, Doubleday-Hill Electric Co.; BALTIMORE, Carl Spoerer's Sons Co.; RICHMOND, VA., Dallas A. Shafer & Co.; ATLANTA, Johnson-Gewinner Co.; TOLEDO, W. G. Nagel Electric Co.; CINCINNATI, Oskamp Auto Supply Co.; MINNEAPOLIS, Pence Automobile Co.; DES MOINES, Herring Motor Supply Co.; OMAHA, Powell Supply Co.; KANSAS CITY, MO., Kansas City Auto Supply Co.; ST. LOUIS, Phoenix Auto Supply Co.; DENVER, Fry & McGill Motor Supply Co.; SEATTLE, Ballou & Wright; PORTLAND, ORE., Ballou & Wright; LOS ANGELES, E. A. Featherstone.

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We are looking for the manufacturer who is not 100% satisfied with the motor he is using.

Ergon Motors will satisfy those manufacturers.

Ergon Motors are not revolutionary in design and construction—they are simply refined and developed to a point in keeping with the extreme demands of the present day pleasure and commercial vehicle requirements.

Not only has great care been used to assure great power and light weight but in the attaining of this end equal attention has been paid to the simplicity, durability and accesibility of the motor.

Our crank shafts and cam shafts are made by the Driggs-Seabury Ordnance Corporation, and the silent chain drives which replace the timing gears, are made by the famous firm of Hans Renold. In the transmission, Timken bearings are used and the clutch is supported on F & S bearings.

Ergon Motors are 4-cylinder, 4-cycle, water-cooled, L-head, with the cylinders cast in pairs. The motors are of the long stroke design with a bore of 4¼" and a stroke of 6". They are of the unit power plant type with Brown-Lipe dry plate clutch and 3-speed selective transmission.

In keeping with modern demand. Ergon motors are equipped so as to permit of the use of any one of several types of either electric or pneumatic starters.

We are positive that we can satisfy even the most skeptical of the superiority of our product if but given a chance.

Won't you let us hear from you?

HAZARD
MOTOR MANUFACTURING COMPANY
ROCHESTER, NEW YORK



Model 31. Forward-Drive Brougham; Pedestal front seats. Wheel or lever steer, as preferred.

The LUXURIOUS BROC ELECTRIC

THE degree of roominess in an electric may be a matter of inches. But dimensions do not always prove roominess unless you know all dimensions, and can see the car.

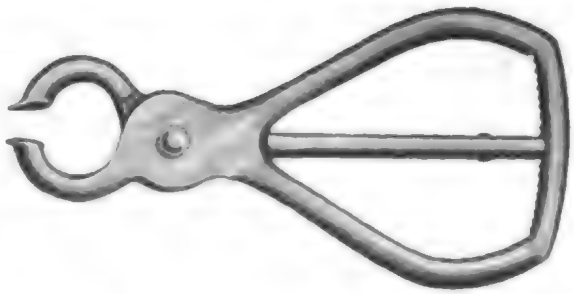
The Broc rear-seat cushion is 49 inches wide, and 8½ inches deep. There are 44½ inches of clear space between top of cushion and ceiling.

The importance of those extra-liberal provisions for roominess is not wholly in the dimensions themselves.

For every dimension of the interior follows that standard. Knee-room, foot-room, leg-room is always ample.

With all that roominess, nothing of exterior or interior beauty—of grace, proportions or finish—is sacrificed. The best-looking cars are Brocs.

The BROC ELECTRIC VEHICLE COMPANY
1677 East Fortieth Street Cleveland



GILMER TIRE REPAIR PLIERS

An absolute necessity in the garage—a ready seller and one that you ought to handle.

This little instrument has a big mission, repairing trifling injuries before they become big and serious. A dollar invested by your customer will save him many dollars in the course of a year.

Aside from the liberal commission which is yours from each sale, you are conserving the best interests of your trade by introducing and selling Gilmer Tire Repair Pliers. It is all a matter of service, and the successful dealer today is the one who helps his trade save money.

The operation of sealing up cuts and abrasions is simple. Just insert the prongs of the pliers into the injury, spread the pliers, and move the ratchet lever over far enough to make the cut perfectly accessible. Then clean the wound, insert pure rubber gum and reverse the operation of opening. Then the tire will close over and around the gum, producing a permanent repair.

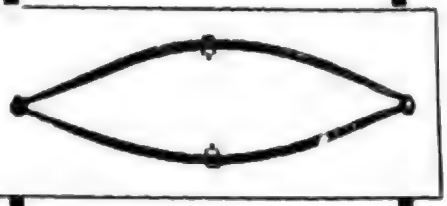
Write and get details—better still lay in a stock now—and see how kindly car owners in your territory will take to this little device.

G. WALKER GILMER, Jr.
52 North Seventh Street Philadelphia, Pa.

GILMER TIRE-REPAIR PLIERS
PATENTED TRADE MARK

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Penn Springs



Penn Spring Works

BALDWINSVILLE
NEW YORK

PENN SPRINGS are tested for resiliency and tensile strength far beyond any point that could be reached in every day service. They are guaranteed against fatigue and through the special grades of steel and methods of construction they will give service "plus."

Car manufacturers can make our engineering force part of their organization in the work of producing springs that are true in even load carrying, resilient and engineered to fit the particular car for which they are designed.

The Triplex Starter
for FORD Engines



"It is out of sight," under the hood. All that shows is a small hand lever on dash. You do not have to leave your seat to start your Ford Motor when equipped with the TRIPLEX STARTER.

All that is necessary is to pull the lever. Will positively turn your motor over every time.

The TRIPLEX FORD ENGINE STARTER is a mechanical starter, which, of all types—compressed air, acetylene gas, electric and spring—is the only one on the market which at all times proves absolutely RELIABLE. In no respect is it a "Hit-or-Miss" proposition—working one minute and short-circuiting or blowing out a cylinder head the next. It gives 100% uninterrupted service from the time it is attached. It comprises so few parts and is so simple and direct in application that it cannot get our of order, and it is as safe and durable as it is simple and effective.

With the TRIPLEX STARTER you have two starting devices. You do not remove the crank. It stays on.

"Ask the man that has one."

To be had at all dealers or direct on receipt of price.

DEALERS.—It doesn't require SALESMANSHIP to sell an ARTICLE for which every FORD OWNER is clamoring. Bring the TRIPLEX FORD ENGINE STARTER and the FORD OWNER together and a sale results. Big Sales spell Big Profits. Get our Sales Proposition today. Write or Wire. No more broken arms. Back kicks are dangerous.

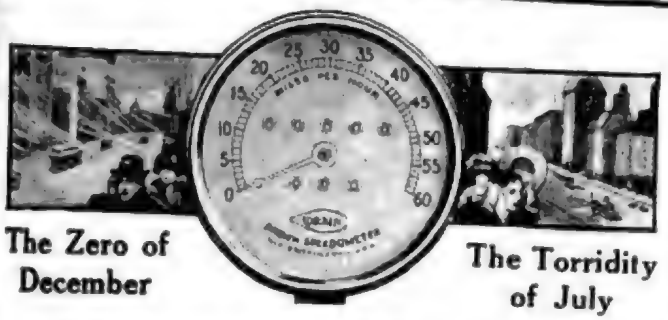


PRICE $11.50

Write Department 10

BREMER-WILSON MANUFACTURING CO.
1475 MICHIGAN AVENUE, CHICAGO, ILL.
Western Representatives, AUSTERMELL & HANSON, 560 Phelan Bldg., San Francisco, Cal.

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The Zero of December

The Torridity of July

cannot effect the absolute unvarying accuracy of the

CORBIN-BROWN SPEEDOMETER

"The Speedometer of Absolute Accuracy"

because—

It is constructed on the centrifugal principle of physics. Science has proved that mechanism so constructed is not affected by climatic changes.

All parts of the Corbin-Brown Speedometer are made of specially hardened steel or brass and assembled with the precision of a high grade watch.

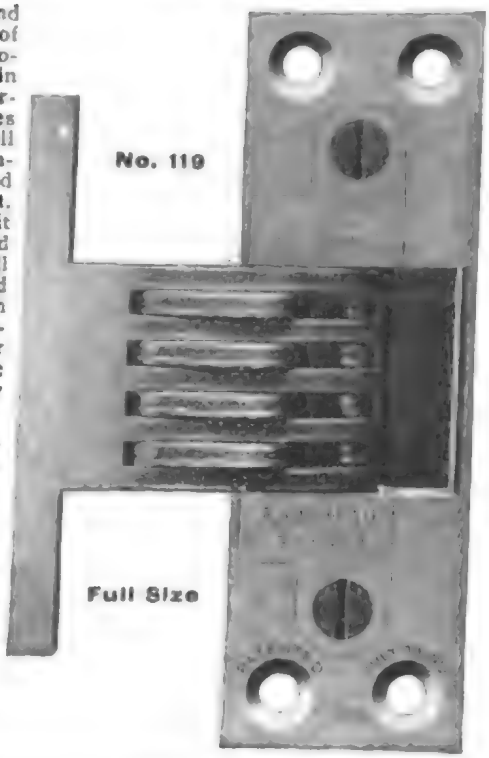
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Corbin Screw Corporation Division
AMERICAN HARDWARE CORPORATION
213 High Street NEW BRITAIN, CONN.
BRANCHES: NEW YORK, CHICAGO, PHILADELPHIA
Makers of the celebrated Corbin Coaster Brakes for Bicycles and Motorcycles

"SOSS" INVISIBLE AUTOMOBILE HINGES

The detachable and water-tight features of our No. 119 Automobile Door Hinge, in addition to the interlocking action, makes this the best, as well as the strongest constructed concealed hinge on the market. Made in two parts, it is easily attached and detached. Water will not reach the wood of the body through the hinge. When installed holds the door rigid and at the same time has a perfectly smooth action.

Send now for catalog and full particulars.



SOSS MANUFACTURING COMPANY
435-443 Atlantic Avenue
BROOKLYN, N. Y.



[Front view ½ actual size.]

BOYCE
MOTOMETER
PAT'S PEND'G

1913's TRADE SENSATION

KNOW THE EXACT HEAT OF YOUR MOTOR WHILE DRIVING

The Motometer is a watchlike instrument fitted to the radiator cap, protecting the motor from damage caused by improper lubrication, overheating, defective cooling, etc. By means of a red fluid indicator it warns you

When the Radiator Needs Water
When Oil Supply Is Insufficient

In short, it tells whatever excessive heat tells—a broken water pump, a clogged pipe, a broken fan belt, etc., and tells before the damage is done.

Attached the same as an ornament, readily visible from the seat day or night. It will prevent frozen radiators in winter and cracked cylinders in summer.

Finished in black enamel with gold plated or nickel rims.



View from Seat

The Motometer Company, Inc.
901 U. S. Rubber Bldg.
Broadway and 58th Street, New York
Chicago Branch: 1322 Michigan Avenue

KLINE CAR

"FORTY" $1985

The best four-cylinder forty horsepower car on the market with separate electric starting and lighting, and separate ignition systems. The economical four speed forward transmission is another big asset.

Address Dept. W for Catalog

KLINE MOTOR CAR CORPORATION
Richmond, Va. York, Pa.
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B-T-K

PARTS OF QUALITY

TRANSMISSIONS, CLUTCHES and LEVERS

To fill all requirements in pleasure cars and light trucks

Contract Work, Gear Cutting

Brass, Copper and Nickel Plating

Our Engineering Department is at your service

For further particulars address

AUTO PARTS MFG. CO., Dept. J. Muncie, Indiana

REMY MAGNETOS

400 SOLD DAILY

This is not the record of a single day. This is a daily average—for four months ending with January—of cars newly equipped with Remy magnetos. These figures have never been approached by any other manufacturer.

Inductor Type—Simplest, Strongest

Built for 24-hour a Day Service

REMY ELECTRIC COMPANY

World's Largest Ignition Factory

Anderson, Indiana

The Hotel of Comfort

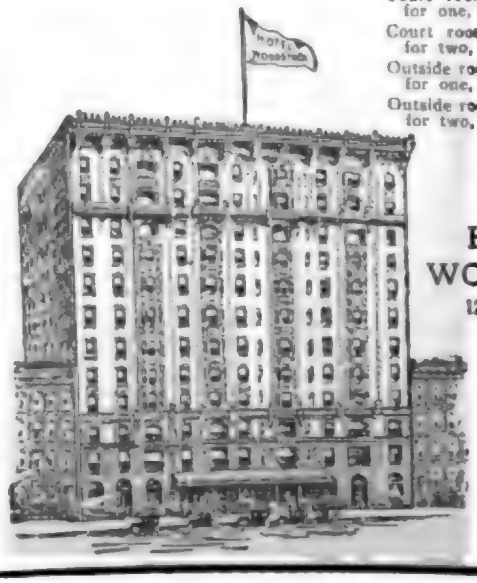
The WOODSTOCK

"You can walk from there to anywhere"

Our new addition is ready for occupancy.
We now have 360 rooms with 265 baths.
Write us for descriptive folder with typical floor plan and rate card.
Wire for reservation at our expense.

RATES

Court room with bath, for one, per day.....$2.50
Court room with bath, for two, per day..... 3.50
Outside room with bath, for one, per day..... 3.00
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Outside room with twin beds, for two, per day $4.00



HOTEL WOODSTOCK
127 W. 43d St.
New York

W. H. Valiquette, Manager.

Also
"THE BERWICK"
Rutland, Vermont

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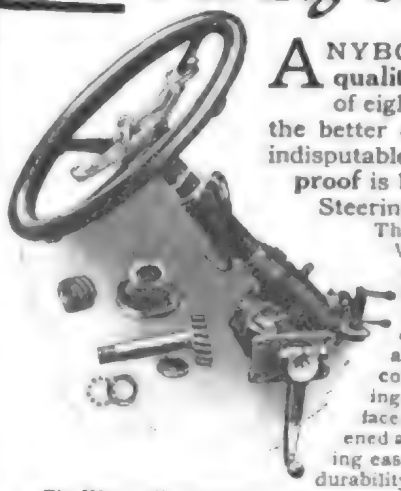
The SCHRADER
Universal Tire Pressure Gauge



For Sale by Tire Manufacturers, Jobbers, Dealers, Garages or

A. SCHRADER'S SON, Inc., 32 Rose St., New York

Warner Quality
Steering Gears



ANYBODY can claim quality—but a record of eight years use on the better class of cars is indisputable proof. That proof is back of Warner Steering Gears.

The prime features of Warner Gears are: accessibility; complete interchangeability; use of eccentric sleeves; adjustable angle of column; large bearing and contact surfaces specially hardened and ground, assuring ease of motion and durability.

The Warner line includes a wide range in both pleasure and commercial types.

We guarantee dependable deliveries.

Get acquainted with Warner Quality—make it another selling argument.

We modify our designs to meet your detail requirements, or build on approved designs on seasons quantity specifications.

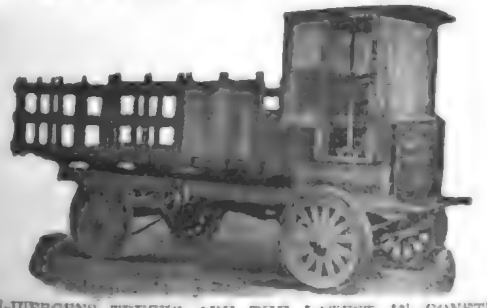
Detroit Office 625 Ford Building — Philadelphia Office Glenwood Ave. & 2nd St.

Warner Gear Co.
Muncie Indiana

Lauth-Juergens

Lauth-Juergens Trucks are Delivery Insurance

QUALITY DURABILITY
ONE, TWO AND THREE TON CAPACITY



LAUTH-JUERGENS TRUCKS ARE THE LATEST IN CONSTRUCtion, most powerful in operation and the motors are guaranteed against defective workmanship and material for the life of the truck. They are positively the highest class trucks made. Two cylinder, one-ton, four cylinder, one, two and three-ton. Four speeds forward. Ross-Bright ball bearing transmission made in our own shops of the finest tool steel, three-plate disc clutch, covered by patents owned by us. Send for 1912 catalog and specifications. Prompt delivery on all models. Large publicity campaign just begun. Our quality will do the rest.

Reliable Agents: Secure Your Territory for 1912 at Once.

The Lauth-Juergens Motor Car Co., Fremont, Ohio.

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NEW YORK—West Side Garage & Motor Co., 160-162 101st St.
CHICAGO—The Lauth-Juergens Motor Car Co., 2630-32 Wabash Ave.
NEWARK, N. J.—Merchants Motor Car Co., Essex Building.
DETROIT, MICH.—Bierl Auto Truck Sales Agency, 453 Dix Ave.
DISTRICT OF COLUMBIA AND VICINITY—Bowles Motor Sales Co., Inc., 1606 14th St. N. W., Washington, D. C.

Croxton

Croxton cars incorporate all of the features for which the buyer looks in the new models. Write for catalog and agency details.

The Croxton Motor Car Co.
Washington, Pa.



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BENZ

Since the introduction of BENZ cars to the motoring public of America no car has attained such world-wide supremacy as to its construction, standing up quality, and material The new type of 35 and 50 H. P. BENZ models are the last word in automobile construction.

The noticeable features of this type of BENZ cars include the offset crank shaft, smokeless oiler, and SILENT CHAINS instead of timing gears.

The BENZ Carrosseries are noted for their beautiful lines and thorough comfort.

To those desiring AGENCY of this car the Benz Company will offer special terms. We want RELIABLE, ENERGETIC agents to further our interests for both BENZ pleasure cars and BENZ-GAGGENAU trucks, which today stand recognized by those who know, as the leading 6-ton truck. Wire or write us, no matter where you are.

Our PRICES compete with LEADING AMERICAN makes.

BENZ AUTO IMPORT COMPANY OF AMERICA

250 West 54th Street New York, N. Y.

Direct Branch of Benz & Cie., Mannheim, Germany.

Dart
MOTOR TRUCKS

THREE EXCEPTIONAL MODELS:

Model ED—1,000 lbs. capacity (2 cyl.)	$ 750
Model B—1,000 to 2,000 lbs. capacity (4 cyl.)	1,100
Model C—2,000 to 3,000 lbs. capacity (4 cyl.)	1,775

Write us for full information and liberal specifications.

THE DART MOTOR MANUFACTURING CO.
WATERLOO, IOWA (16)

70% MORE TIRE MILES
WIRE McCUE WHEELS

Save Tires—Save Fuel—Save Car. Make cars easier riding and easier driving. Stronger than any other practical wheel.

THE McCUE CO., Buffalo, N. Y.

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ESTABLISHED 1871

AUTO-LITER
The Positive Electric Starter and Lighter
STURDY, DEPENDABLE, NEVER FAILING

In its simplicity lies its perfection. Operates on a six-volt current.

To manufacturers, dealers and prospective car owners our catalog and descriptive literature are interesting and highly important. They treat the subjects of starting and lighting automobiles intelligently and exhaustively.

Our dealers' self-starter proposition is especially attractive. Write today.

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TRUCK FRAMES

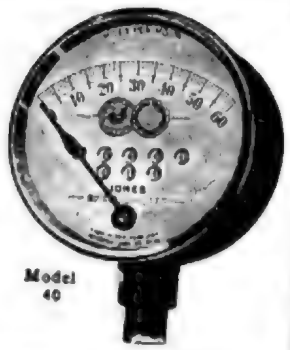
Automobile Frames and Special Stampings

THE PARISH & BINGHAM CO.

CLEVELAND, OHIO

The Jones Speedometer

is permanently accurate because it is beyond any external influence to disturb or alter the basic relation of centrifugal force and speed. Centrifugal force always declares the speed truth.



JONES SPEEDOMETER

Broadway at 70th St., New York

Plants { Bush Terminal, Brooklyn, N.Y. / New Rochelle, N. Y.

Model 40

Stearns

THE ULTIMATE CAR
(KNIGHT TYPE MOTOR)

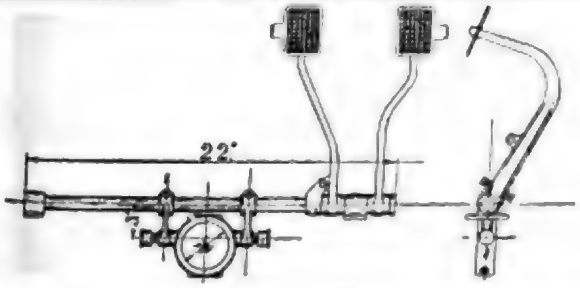
The first American Car to adopt the Silent Knight Motor—the engine used by Daimler, Mercedes, Panhard and Minerva.

THE F. B. STEARNS CO.
CLEVELAND, OHIO
Branches and Dealers in 125 Cities

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FRAMES

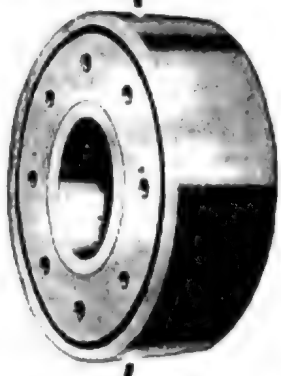
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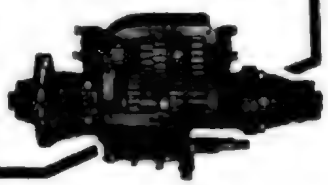
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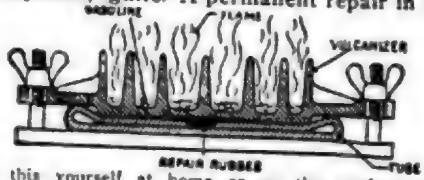
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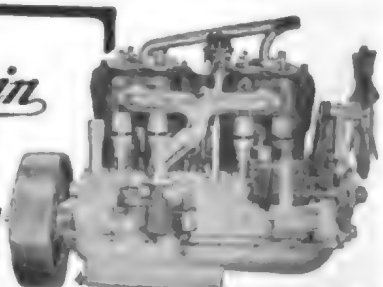
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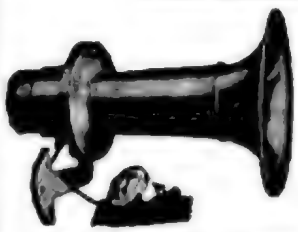


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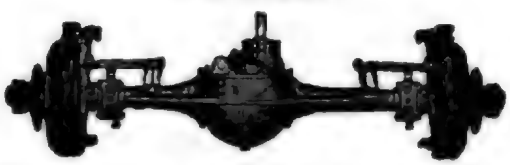
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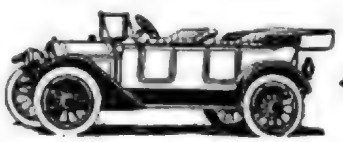
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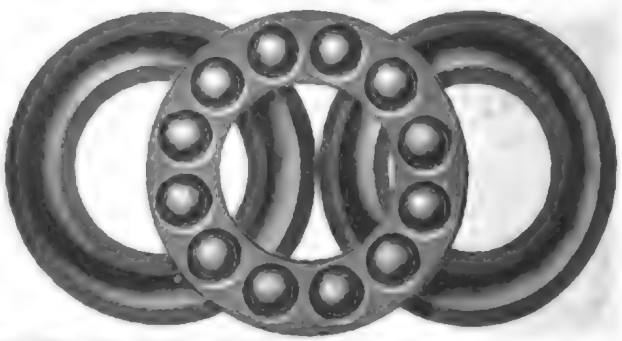
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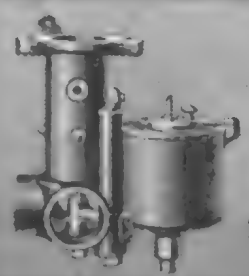
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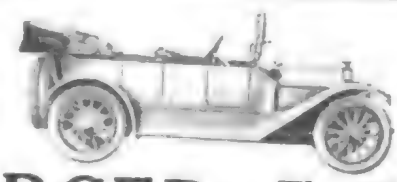
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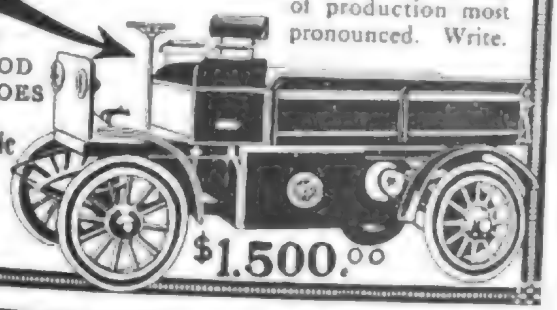
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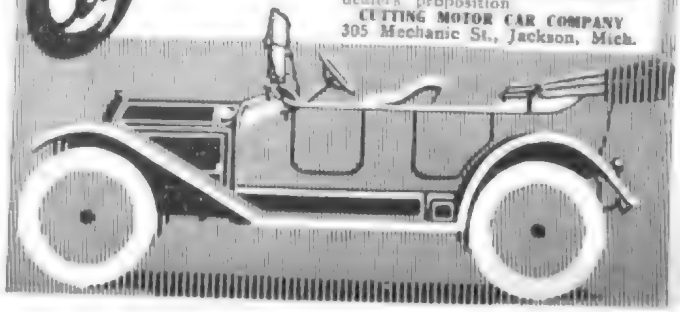
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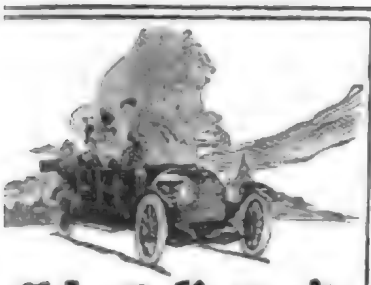
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MODELS AND PRICES

...Torpedo Roadster, 116-inch wheel base	$1700
...-passenger, Fore-Door Touring Car 116-inch wheel base	$1700
...-passenger, Fore-Door Demi-Tonneau 121-inch wheel base	$1975
...-passenger, Fore-Door Touring Car ...-inch wheel base	$2000
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Every Stutz Car

...ingly easy-riding and comfortable. The ...line low slung body, deep upholstery and ...appointments of the Sturdy STUTZ give ...ristocratic design which lends dignity and ...to a high class motor car. Write today for booklet A-15, Sturdy STUTZ Announce-...ents B

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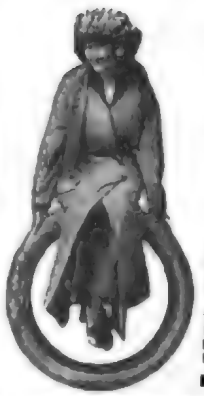
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The tire for you is the one that you can put on and forget.

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The successful Starter for Fords as well as other makes. Combined Starter and Lighter, $35. Live Dealers given exclusive territory.

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GARAGE MODEL repairs three tubes and two casings at a time. Cheapest and best on the market. Get our special selling plan. Portable model for individual owners which will please your customers. List price, $13. Manufactured by

THE NATIONAL MOTOR SUPPLY CO.

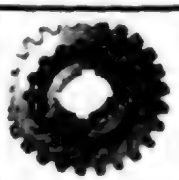
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Automatic, therefore safe for rubber. Uses alcohol or gasoline. Low priced. Send for sales plan and sample Vulcanizer.

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Special features that eliminate speedometer troubles. Send for the booklet.

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NOW READY FOR THE TRADE

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The Great Anti-Skid DEVICE

Nine-tenths of all accidents to automobiles are caused by skidding or slipping.

Either you skid into the "other fellow" or the "other fellow" skids into you.

No matter how careful a driver you may be, you cannot prevent skidding or slipping on wet, muddy snow-covered roads or on icy, slippery greasy pavements unless you equip your car with Weed Chains.

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An absolute necessity on both rear wheels and if you want to know what real steering steadiness means put them on the front wheels too.

For your own safety—for the safety of the public, fully equip your car with Weed Chains. Make it your business to get a set today.

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These Tires for You

Four corps of experts working in four of the best equipped tire plants in the world are operating as a unit to produce

UNITED STATES TIRES

Nothing of the kind has ever before been attempted in automobile tire manufacturing.

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Write for "Guide Books" Nos. 1 and 6

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Mosler Spit Fire Plugs ARE THE BEST

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Completely equipped, fully guaranteed. 22½ H.P., 4-cylinder water-cooled motor, Bosch magneto. Artillery wheels, best quality 30" x 3" clincher tires. Makes 5 to 50 miles per hour on the high speed, 28 to 32 miles on 1 gal. of gasoline. You can secure EXCLUSIVE SALE in your territory. Send for Book "B."

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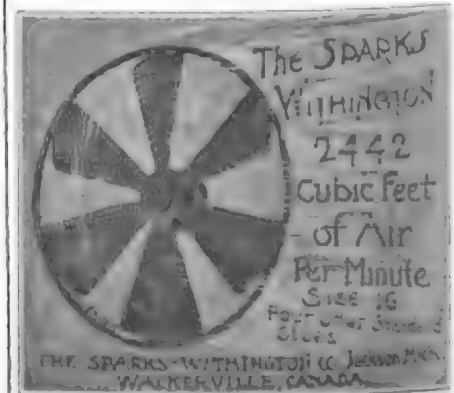
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Estimates Cheerfully Furnished

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Blow-out repairs that outlast the tire.

The only way to make **durable** blow-out repairs **economically** is to reinforce the tire with fabric applied to the inside, fill the hole through the tire with Para gum, then apply heat **both** to the inside and outside. This method avoids cutting away and wasting a lot of expensive tread stock, requires a minimum of fabric and makes a repair that is stronger than the tire. Anyone can use it because the work is all straightforward, requiring no special experience. One set of forms fits all sizes of tires. No extra moulds required.

SHALER Steam Vulcanizer

The Shaler is the only steam vulcanizer that permits using the approved wrapped tread method as it is the only one that applies heat to the inside and outside of a tire simultaneously. It makes perfect blow-out repairs.

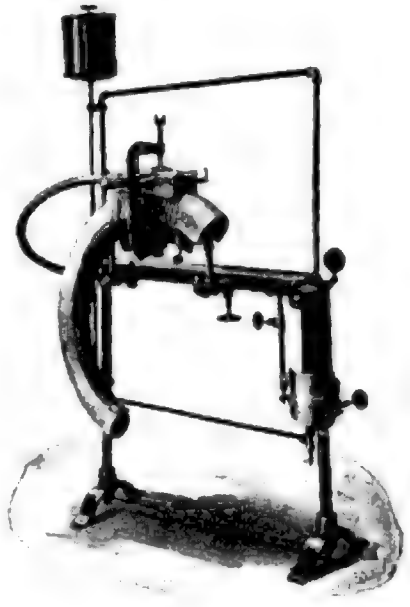
To make it complete as a garage equipment it is provided with a tube plate 4 x 30 inches that will mend six tubes as quickly as one.

The boiler, a conical copper coil, heated by a powerful gas or gasoline burner, raises steam so quickly that you can profitably heat the Shaler even if you only have a tube puncture to mend.

The essential Shaler feature of a thermostat to hold the temperature at the vulcanizing degree automatically makes it impossible to overheat a tire. Simply light the burner, and steam is raised to the correct pressure and held there indefinitely.

Price of the complete outfit, including all attachments for tube and casing work, $45.

C. A. SHALER CO., 406 Fourth St., Waupun, Wis.



Free—a tire handbook for repairmen

Write today on your letterhead for a copy of "Common Sense About Tire Repairs." It contains a lot of money-making ideas about the most profitable part of the repair business.

Remember these facts about Prest-O-Lite Exchange Service

When you turn in your empty Prest-O-Lite be sure to get a genuine Prest-O-Lite in exchange. Because Prest-O-Lite Service means more than merely giving you a fresh charge of gas.

In addition to this, ***Prest-O-Lite Service*** includes putting every cylinder that passes through our hands in perfect working order.

In many cases the actual cost of replenishing the solvent, regulating and refinishing the cylinder is more than the small exchange fee.

And on top of this, the owner of a genuine Prest-O-Lite has the privilege of having his empty cylinder, plus a small exchange fee, accepted without question as full payment for what is practically a new Prest-O-Lite, at any of our exchange agencies. When you get an imitation, or a Prest-O-Lite cylinder which some imitator has filled, do you get this service?

The user of genuine Prest-O-Lite pays nothing extra for this service. If you would protect your investment, be sure no one slips on an imitation for your genuine Prest-O-Lite.

Remember that no imitator ever stayed in business long enough to build up a satisfactory exchange service and that no imitator has ever stayed in business long enough to protect the customer's investment.

Mighty few wise dealers trifle with imitations of Prest-O-Lite now.

The Prest-O-Lite Co. 287 East South St. Indianapolis, Indiana

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Branch Offices and Service Stations in all principal cities.
Charging Plants in all parts of the country.
Extensive foreign service.

Exchange Agencies Everywhere

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A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

FOR SALE OR LEASE

2

AUTOMOBILE

SERVICE AND GARAGE

BUILDINGS

These properties—now occupied by subsidiary companies of the International Motor Co.—are perfectly equipped for business, and entering tenants will not have to spend any money for changes or improvements.

N. E. COR. 64TH ST. & WEST END AVE.

8 story fireproof service building, plot 50 x 100. Now occupied by Hewitt Motor Co. Will be leased. In connection with this property the adjoining

THREE LOTS ON 64TH ST.

75 x 100, if desired, can be bought at a bargain.

FINE LOCATION IN BROOKLYN

532-540 Atlantic Avenue, Brooklyn, 1 and 3-story service building and garage, 130 x 90. Now occupied by Mack Bros. Motor Car Co. Will be leased or sold.

In each instance possession may be had May 1st. Address

F. R. WOOD, W. H. DOLSON CO.,

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FOR SALE—Garage, fully equipped, within 50 miles of New York City. Two-story brick building, steam heat, 1,000-gal. gas tank, full stock of oils, greases, supplies and accessories. Agency for two standard non-competing cars. Storage for 35 cars. This is a rare chance for a live man. Ill health of owner reason for selling. Address Motor World, Box 241.

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Owners or dealers; any state, county, city; weekly and monthly supplements at lowest prices. Special lists of Electrics, Trucks, Fords, Studebaker, Overland, etc.
MOTOR LIST CO. OF AMERICA
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CYLINDERS reground. Pistons fitted. Prompt shipments. HAUBER AUTOMOBILE WORKS, St. Marys, Pa.

WANTED—New or slightly used unit power plant, 25 or 30 H.P., 4 cyl. Must be a bargain. BENTON & IVES, Kiowa, Kans.

WANTED—THOROUGHLY COMPETENT AUTOMOBILE MECHANIC, UNDERSTAND ELECTRIC LIGHTING AND STARTING SYSTEMS. JUST THE PLACE FOR MAN DESIRING TO LOCATE OUTSIDE OF CITY. BOX 387, MIDDLETOWN, N. Y.

FOR SALE—Rambler, early 1911 model, two extra seats, fore-door touring body car, fully equipped, in fine condition, 45 H.P. Sell for $550. MAX COHEN, 8 W. 36th St., New York.

FOR SALE.
COMPLETE WORKING DRAWINGS AND PARTS
FOR THE MANUFACTURE OF
GASOLINE LIGHT DELIVERY TRUCKS.

With the purchase of a business, we acquired among other things complete working drawings and stock of parts for medium priced gasoline motor delivery wagon, designed by Gustave Chedru. Several prominent Buffalo merchants are using these delivery wagons, and they are giving very satisfactory service.

We will dispose of the whole of these drawings and stock of parts at a bargain. Here is a chance to secure a successful design, complete working drawings and stock of parts at very much below their market value, and at about 10 per cent. of what it would cost any manufacturer starting in the delivery truck business for a design, experimental and development work.
BUFFALO ELECTRIC VEHICLE CO.,
BUFFALO, N. Y.

FOR SALE—Garage, equipment and business at Hobart, Okla., county seat of 5,000, two railroads, prosperous and growing agricultural section surrounding. Weather and roads such that everybody uses the auto the year round. No tie up for snow and ice. Come or write. D. A. SCOTT, Hobart, Okla.

FORD Model T Reference Book" gives cause and cure of all the ails of Model T simply and concise. Gives the latest kinks. Full of pointers. Written especially for it. Elaborate cross index enables you to discover any trouble at once. Write for descriptive circular or sent postpaid, $1.00. FORD REFERENCE BOOK CO., 57 West 125th St., New York.

FURS—SOMETHING NEW, BEAUTIFUL AND ELEGANT CARRIAGE COVERS; TRAVELER WISHES TO REALIZE. CALL FROM 9 TO 2. ALVAREZ, 138 WEST 46TH ST., NEW YORK CITY.

AUTO LISTS, owners, etc., of any State S. H. CARROLL, JR., Albany, N. Y.

TOPS AND SEAT COVERS.
High-grade material and experienced workmanship in either case. Our Tops are built to look right tomorrow and a year from tomorrow. Our Seat Covers can be cleaned to look like new, with gasoline or soap and water. We're glad to estimate special work or quote prices on stock goods. Prompt service assured. CENTRAL AUTO TOP CO., 120 W. Mich. St., Indianapolis, Ind.

FOR SALE—Cheap, one American Traveler, color battleship gray; just like new; run a little over 4,305 miles. MICHIGAN AUTO CO., 410 7th St., Calumet, Mich.



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A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

PEERLESS AUTO TOP DRESSING.
A waterproof dressing for leaking mohair and duck tops and curtains. Makes old and faded tops look like new. Ask your garage and supply dealer for it.
The Columbus Varnish Co., Columbus, O.

AUTOMOBILE FOR SALE—1912 Marmon Speedster, Indianapolis Speedway type car. A-1 condition; run 4,000 miles. For particulars apply W. F. BURROUGHS, 66 Midland Ave., Arlington, N. J. Tel. 29 Arlington.

WANTED TO BUY—Five or seven passenger automobile for cash, in good condition; no dealers. 172 Pacific St., Brooklyn, N. Y.

BARGAIN—Two new and never used 34 x 4 Davis Armor, Model B, Tire Protectors; cost $54.00. Will take $32.00. Disposed of car before "Armors" arrived. BOX 231, care Motor World.

LOT in Velasco, Texas, for automobile or motor boat; paid $1,000 20 years ago. TOM CHILDRESS, R. F. D. No. 2, Arlington, Texas.

PEERLESS EXTRA FINE BLACK JAPAN.
Covers solid one coat for enameling lamps, radiators and fenders. No undercoat required. Heat does not affect it. Ask your garage and supply dealer.
The Columbus Varnish Co., Columbus, O.

ALUMINUM vulcanizers for both casings and tubes. $3.50 prepaid to any address. Money back if not satisfactory. TRUSCOTT SUPPLY CO., St. Joseph, Mich.

RURAL Parcels Post Delivery Car—Any party with capital and push interested in placing one on the market, correspond with E. P. COWLS, Sparta, Mich.

AUTOMOBILE CYLINDERS reground, new pistons and rings fitted. Garage air compressors. CAST IRON BRAZING CO., Manchester, N. H.

PEERLESS LEATHER TOP DRESSING
An oil preparation that softens the leather and pantasote. Makes old tops look like new. Ask your garage and supply dealer for it.
The Columbus Varnish Co., Columbus, O.

WANTED—Salesman for agencies in every city to install new process in demand, showing over 300% profit to garages, supply dealers, breweries. Entirely new, big seller. This means big money. Experience not essential. H. J. WEBER, South Orange, N. J.

PEERLESS LINING DYE.
Dyes the cloth linings of tops and curtains a black, uniform color, covering up water stains and grease spots. Does not wash off. Ask your garage and supply dealer.
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OFFICE MANAGER, good executive ability, competent to handle correspondence, accounts, handling salesmen, etc.; wants to relocate. Now with motor truck company. Box No. 244, Motor World.

FOR SALE OR LEASE—The most modern garage in Southern Colorado, with fine repair shop and storage room for sixteen cars, doing good business and fine prospects for coming year. A snap for someone. Address BOX 208, Monte Vista, Colo.

ARE YOU in need of any additional help in any department of your business? Are you out of employment or looking for a better connection? Have you second-hand apparatus of any kind or do you want to buy second-hand material. Have you a factory site for sale or do you want to buy one? If so, use the Want and For Sale column of the Motor World. Seven words to the line, fifteen cents a line. Advertisements can be inserted over a number when it is desired and identity of the advertiser will be kept confidential.

PEERLESS BACK AND CUSHION DRESSING.
Softens the leather and will not crack, wash or rub off. Makes old leather look like new. Dries in twenty minutes. Ask your garage or supply dealer.
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BROKEN Cylinders and Crankcases—Send them to be made good as new at fraction of replacement cost. Scored cylinder repaired, $12. No new piston and rings required because bore is not enlarged. Where cylinders are worn (not scored from loose wrist pin) reboring is only remedy. We do it expertly. Write for complete information and estimates. WATERBURY WELDING COMPANY, Waterbury, Conn.

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PEERLESS EXTRA FINE BLACK BAKING JAPAN.
Bakes either to a high gloss finish, eggshell gloss or dull finish on lamps, radiators and fenders. Will not crack, chip or peel. Ask your garage and supply dealer.
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BROKEN CRANKSHAFTS, cylinders, crankcases, flywheels, gear teeth, pistons, perfectly welded and machined ready to replace. Guaranteed and references. Machinery up to 5 tons welded. ATLAS WELDING WORKS, 74-76-78 Irving St., Rahway, N. J.

AR-GEN-TOR will deposit a beautiful silver plate on your brass trimmings in one minute. Absolutely reliable. Price $1.00. Send for package. Quit polishing brass. FOREST CITY SALES CO., Fremont, Neb.

FOR HIRE—White 1½-ton truck by week. CHAS. HONEHEIN, 2027 3rd Ave., New York City.

KEROSENE FOR AUTOMOBILES.
New Model B uses successfully half and half mixture lowest grades kerosene and gasolene. Satisfaction guaranteed or money refunded. Greatly increased power, very slow speed on high. Starts easy at zero. Special agents' prices. Dept. 8. THE AIR-FRICTION CARBURETOR CO., Dayton, Ohio.

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An ad. like this will cost you 90c. for each insertion.

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Write for Book "What's What In Tires," by H. S. Firestone

ASK THEM!

IF *you are BUYING a car*—and the car you select is not on this list, ask the agents WHY! —ask them if the bulb-horn is *enough!*

Klaxonized Cars

A. E. C.
Alco
Armleder
Autocar
Babcock Electric Roadster
H. H. Babcock
Bailey
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Chicago Electric
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Simplex
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Stevens-Duryea
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Cole, Hudson, Packard } *Special*
Charon, Lancia, Schneider } *European*

IF *you are the Car Agent* —and the car you sell is not Klaxonized, ask the *factory* WHY! —ask them if there is a single real reason for equipping with the bulb-horn, except that it is *cheap.*



KLAXONET

Lovell-McConnell Mfg Company Newark, N.J., U.S.A.

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"The Public Safety Signal"



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Marion

MARION 37 A
Complete
$1475

Electric Self-Starter on Marion Cars

The Marion 48-A, the Marion de luxe, is now equipped with Westinghouse electric self-starter, making it an electrically-equipped car throughout—electric starter, electric dynamo lighting system, electric horn, and 120-hour auxiliary storage battery charged by the dynamo. With complete equipment, $1,850.

The famous Marion 37-A touring car, the "Bobcat," and the new fore-door roadster, 30-40 h. p. cars selling for $1,475, $1,425 and $1,475 respectively, can be supplied with this electric starter, instead of gas, for $120 extra. This is at cost, $50 less than the prevailing price for a good electric starter.

This electric starter may be seen in operation at the automobile shows, or at Marion dealers. It embodies features which make it distinctly superior to the average outfits. Such, for example, is a clutch which prevents the electric motor from being driven too fast or backwards by the gasoline engine.

The electric starter, or the Disco gas starter supplied with the 30-40 h. p. cars unless the electric is ordered, increases the value of Marion motor cars to every owner and dealer. They are the most remarkable cars of the season at their prices, in appearance, size, luxury, and completeness of equipment.

Do not fail to see these cars whenever possible. They are being exhibited at all the shows, and you can buy these show cars or a duplicate of them from any Marion dealer.

Marion Equipment Is Complete. It includes self-starter, electric or gas as listed above; electric dynamo lighting system for five lamps; auxiliary storage battery, charged by dynamo; Warner speedometer; Q. D. demountable rims, one extra rim; Mohair top, boot, storm curtains; plate glass windshield; tire irons, tire repair kit, pump; robe rail and foot rest on touring cars; jack and tools. Everything you need.

Let us send you literature describing these cars in detail, and give our proposition to dealers.

Made in Indianapolis by

THE MARION MOTOR CAR COMPANY, 918 Oliver Avenue

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MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXXIV
No. 9

New York, February 20, 1913

Ten cents a copy
Two dollars a year

The Supremacy of

GRAY & DAVIS

20 MANUFACTURERS
Out of
42 MANUFACTURERS

Exhibiting at Madison Square Garden equipped their cars with GRAY & DAVIS Electric Starter, Lighting Dynamo, Electric Lamps or all three in combination.

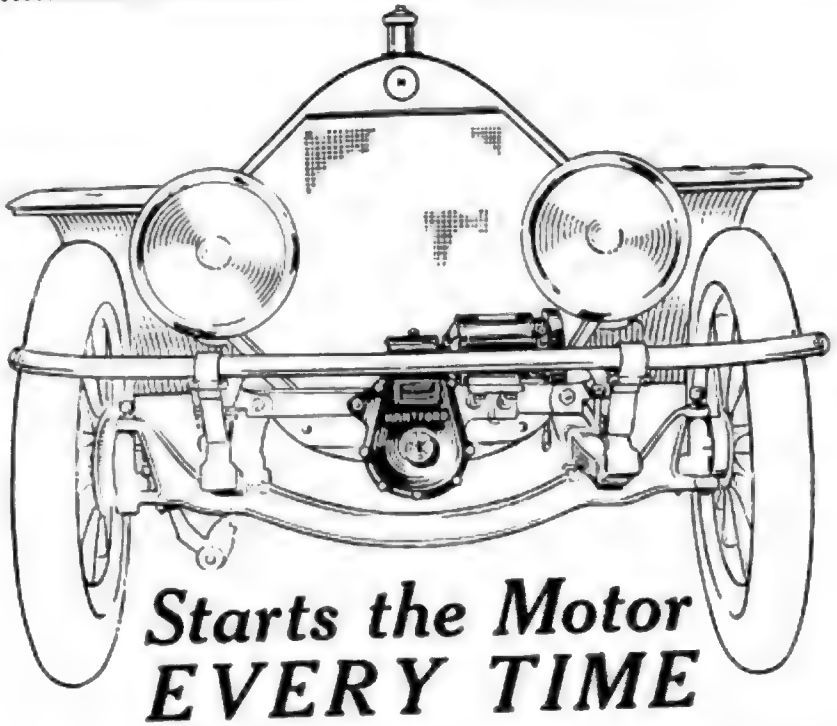
That answers the question: "Who builds the **best** Electric Starter, Lighting System and Lamps?"

Don't accept inferior equipment when you can buy a car equipped with GRAY & DAVIS products.

GRAY & DAVIS, Inc., 55 Lansdowne St., Boston, Mass.

Manufacturers of Automobile Lamps, Dynamos and Electric Starters

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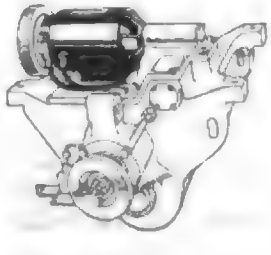
Starts the Motor EVERY TIME

Starts the biggest motor with a press of the button---starts it unfailingly, positively, every time. Yet the

HARTFORD ELECTRIC
Starting and Lighting
SYSTEM

is the smallest and lightest ever devised. invented by Mr. Edw. V. Hartford three years ago, it has been simplified to the extent of six compact, light weight parts that make it the only system applicable to **any** car, old or new. Most powerful motor invented, utilizes a fly wheel on its armature shaft—spins a 90 H.P. engine at 118 revolutions a minute. Most efficient generator invented—produces most power in proportion to size. Smallest battery equipment for a starter—six cells and adequate current constantly on hand for starter and lights.

A new factory with an annual capacity of 90,000 starters is now in operation, assuring delivery on all orders. Send for descriptive matter.



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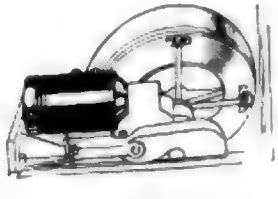
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Hartford Self-Starters, Shock Absorbers, Jacks and Bumpers

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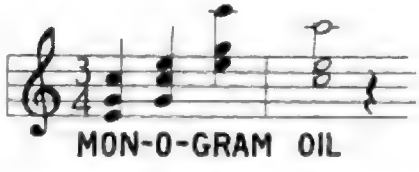
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and the users of motor vehicles are paying the bills. Abroad, where gasoline costs half-a-dollar a gallon, builders of automobiles use only ball bearings.

Why?

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Freedom from necessity of frequent adjustment — ball bearings are fool-proof.

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MOTOR WORLD

Vol. XXXIV New York, U. S. A., Thursday, February 20, 1913 No. 8

TIRE EXPORTS $3,222,133; ENGINES EXCEED A MILLION

Total Foreign Trade in 1912, Exclusive of Cars, $8,963,547—Figure for 1911 Three Million Less—Other Statistics.

Automobile engines, tires and parts to the value of $8,963,547 were exported from the United States to foreign countries during the calendar year of 1912, according to information which is obtainable from the advance report of the Department of Commerce and Labor, which figures are supplementary to the car exports, valued at $23,703,989, as stated in Motor World last week; during the preceding year, 1911, this figure was $5,913,709. During the two years the value of the several items making up these totals were: Engines—1911, $201,409; 1912, $1,137,285. Tires—1911, $2,458,177; 1912, $3,222,133. Parts—1911, $3,254,123; 1912, $4,604,129. The engines for 1911, however, are for the last six months only, they not being separately listed prior to July 1.

In December, 1912, parts to the value of $367,364 were exported, while in the same month of the preceding year the figure was $302,935. The tire exports in these same comparative months were: December, 1911, $200,450; December, 1912, $187,434. Similarly comparing the engine exports, the statistics are: December, 1911, 447, $54,836; December, 1912, 854, $100,753.

In December, 1912, 87 cars, valued at $227,652, were imported, which compares with 103 cars, at $227,067, for December, 1911. The imports for the years 1911 and 1912 were, respectively, 972 cars, valued at $2,098,481, and 868 cars, with a valuation of $1,999,587. A peculiar combination is found in the December imports in that while the number dropped from 103 to 87 the valuation increased by $585, which, however, is slight, being less than one per cent.

During 1912 there were imported parts valued at $275,819, and in December, 1911, the valuation was $50,325, and in that month of the year just closed, $12,694.

Broadwell Out of Hudson Company.

Due to a disagreement as to matters of policy, E. H. Broadwell, vice-president in charge of sales of the Hudson Motor Car Co. of Detroit, has disposed of his interests and wholly retired from the company. C. C. Winningham, former advertising manager, has assumed charge of the sales department also and with it the new title, director of sales and advertising. Broadwell, who is well and widely known, has been connected with the industry almost from its inception, having been conspicuously identified with the Fisk Rubber Co. for many years previous to becoming interested in the Hudson Motor Car Co. Before taking up new duties of any sort Broadwell will spend two or three months vacationizing.

Barley Takes Over Halladay Factory.

A. C. Barley, at one time secretary and a director of the Rutenber Motor Co., has completed negotiations whereby he has become possessed of the property of the bankrupt Streator Motor Car Co. in Streator, Ill. He already has reopened the factory and will re-commence the manufacture of Halladay cars on a conservative basis, devoting himself chiefly to the $1,450 model. A limited number of model 40's, at $1,935, and a few six-cylinder cars also will be produced. When the Streator property was sold by the receiver it was bid in by the Merchants' Realization Co. of Chicago, with whom Barley consummated the transaction which placed him in possession of the plant.

Jones Taximeter Voluntarily Dissolves.

The Jones Taximeter Co., of New York, finally has filed a certificate of voluntary dissolution. The company was an outgrowth of the Jones Speedometer business but has not been active for a year or more, having transferred the patents under which it operated to the American Taximeter Co.

STRIKE OF RUBBER WORKERS DISTURBS AKRON TIRE TRADE

Professional Agitators Fan Small Spark Into Large Flame—No Danger of "Tire Famine"—Status of Factories.

Because of a strike which began in the Firestone Tire & Rubber Co.'s factory in Akron, Ohio, on Wednesday of last week, alarming reports have flooded the press of the country, many of them going so far as to predict a tire famine. As a matter of fact, at last advices, the strike had not become general and most of the Akron tire companies express belief that the trouble will not seriously affect their operations or deliveries, if it affects them at all.

The trouble in the Firestone plant grew out of the installation of new machinery and establishment of a new wage scale, which, however, affected only about 60 men—those known as tire finishers. Before the new machines were installed, one man made a complete tire, but the use of machinery split the work into two processes, one man building the carcass and another finishing the tire. Under the old order of things the workmen earned about $3.50 per day, and it was the intention that the new scale should permit them to average the same amount, for though the use of machines requires that the men produce more tires each day, the machines themselves lighten the actual labor.

According to H. S. Firestone, president of the Firestone Tire & Rubber Co., which is most seriously affected, the comparatively small discontent which first arose would have been adjusted between the company and its employes had not professional labor agitators projected themselves into the affair. The agitators, as Firestone aptly states, "do not live in Akron, have no real interest in Akron or its people, and when peace is restored will pass on to the next place where trouble may be stirring."

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The chief agitator appears to be one of the fire-eating foreigners who last year caused the labor troubles and riots in the textile district of Massachusetts, and who also had a large hand in the strike of the New York garment workers. He is one of the leaders of the Industrial Workers of the World, which sometimes is called the "Industrial Mischief Makers of the World."

Previous efforts to organize the rubber workers in Akron have failed, and in the present instance the Industrial Workers are in conflict with the American Federation of Labor, whose organizers also appeared on the scene; neither organization loves the other, and efforts are in direct conflict, though both are seeking to make the most of the trouble by enrolling the workers in their respective ranks.

Although small disorder has attended the strike, an appeal for the presence of militia was made to the governor of Ohio, which appeal, however, he refused. Instead, he sent the State Arbitration Board to Akron, but its efforts to bring about peace so far have proved fruitless, the Firestone wage scale having become almost a secondary consideration and other demands having been formulated. In preparation for trouble, however, at least one of the big companies is erecting stockades around its property.

It is estimated that there are about 27,000 rubber workers in Akron, and press reports have stated that nearly one-third of the number are on strike. As a matter of fact, however, the exact number is in doubt, and while practically all of the Akron factories have been affected to some degree, in several instances it is so small as to be almost unworthy of mention.

In an effort to make clear the exact situation, Motor World yesterday asked each of the seven Akron tire companies how the strike had affected their operations and deliveries.

"We have no strike in our factory and no differencies with any of our employes," replied the Goodyear Tire & Rubber Co. "A few have remained away out of sympathy for workmen in other factories and owing to fear and intimidation, but we are running our factory full on day shift. Deliveries to customers not affected in any way."

The B. F. Goodrich Co., which controls both the big Goodrich and Diamond factories, states: "At present we are not seriously affected in any of our operations. Our stocks are so plentiful and widely scattered as to prevent any inconvenience to our trade."

The Motz Tire & Rubber Co. replied that the strike had affected its operations not at all, adding that it is satisfied that it is in position to make prompt deliveries.

None of the other companies addressed replied to the inquiry and their New York branch managers apparently deem it the better part of wisdom not to commit themselves to definite statements. What they say, however, is to the effect that if the strike does not last long their stocks on hand will be equal to the demand.

Columbia Litigant Sells His Stock.

Although there was speculation as to what might be the result when Edo E. Mercelis, as attorney for William H. Burger of New York City, a holder of 144 shares of stock in the Columbia Motor Car Co., appealed from the denial by the United States District Court for the Southern District of New York of his request to intervene in the receivership and reorganization of the United States Motor Co., the matter has been peaceably ended through a financial settlement by the reorganizers which was satisfactory to Burger; and while those of the stockholders who assented to the reorganization got more or less stock in the new company, Burger is wearing a smile of satisfaction which is far above the class of those which adorn the faces of the other Columbia paper owners.

Burger's appeal to be allowed to intervene was to have been argued in the Circuit Court of Appeals Monday last, 17th inst., but it was withdrawn before that date. This action lends color to the belief that Burger's case had strength, as was indicated by remarks made by Judge Hough when he denied the application in the lower court.

Cleveland-Galion Truck in Trouble.

On the petition of Elliott Bright, a creditor to the extent of $350, H. B. Thompson has been appointed receiver for the Cleveland-Galion Truck Co. of Cleveland, Ohio, which concurred in the allegations contained in Bright's petition. These statements were to the effect that unless a receiver was appointed, and the assets thereby conserved, suits threatened by other creditors would endanger the value of the property.

The Cleveland-Galion company, which is capitalized at $1,000,000, represents a merger of the two truck companies of those names, neither of which, however, ever cut a very pronounced figure in the business. In fact, after the merger was consummated about a year since the company's efforts were not centered in the manufacture of motor vehicles but in the development and production of an electric platform truck.

Weed Makes Way Harder for E-Z-On.

E-Z-On is the name, but E-Z-Off might be more appropriate in the light of what happened this week to the E-Z-On Chain Tire Protector Co., of Chicago, which started out in December to invade the tire chain grip market but which now realizes that the Weed Chain Tire Grip Co. is rather jealous of a certain patent known by the name of Parsons and which bears the number 723,299. The E-Z-On company apparently found little difficulty in entering upon the stage, and the Weed company supplied the hook which transformed it into E-Z-Off, the Weed company having secured a preliminary injunction against the new chain grip makers this week in the United States District Court for the Northern District of Illinois.

The E-Z-On grip was constructed in a method similar to that of the Weed chain but in appearance differed somewhat in that the side chain, instead of being a circle of ordinary wire link chain, was made with links of a peculiar design; large irregular-shaped links were used for attachment to the cross chains and in turn were connected by other wire designs. With the E-Z-On company there were named as defendants the Hartley Mfg. Co., which helped produce the product, Edward D. Lewis, Thos. V. Garvin and Matthew J. Frambach, all of Chicago.

John Splitdorf Completes New Company.

John M. Splitdorf, formerly of C. F. Splitdorf, Inc., and those who were acting with him, have completed the organization of the John Splitdorf Corporation, which has been incorporated under the laws of New York with an authorized capital of $350,000. The incorporators and officers of the company are: John M. Splitdorf, president and general manager; A. L. Kull, vice-president and sales manager; P. J. W. Kelly, treasurer. E. LeRoy Pelletier, who does not figure as one of the corporators, is secretary of the company. Kull, like Splitdorf, was identified with C. F. Splitdorf, Inc., when the business was taken over by John F. Alvord in May last and reorganized as the Splitdorf Electrical Co.

As stated in Motor World of January 30th, the John Splitdorf Corporation will manufacture an electric engine starter, the work being conducted at 136 West 52nd street, New York City. The starter is understood to employ a reduction gear, which is unusual in that it permits the meshing of four or more teeth. The production is so far advanced that it is stated the first deliveries will be made in two weeks.

Chandler to Locate in Cleveland.

As Motor World intimated would be the case, the Chandler Motor Car Co., which was recently organized by former Lozier lieutenants, has selected a factory site in Cleveland, O. The contracts for the erection of the plant itself will be let on March 1st. Meanwhile the temporary headquarters in Detroit will be maintained.

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SUPREME COURT DISSECTS A MOTOR TRUCK GUARANTEE

Far-Reaching Decision That Renders the Promise of a Salesman or Other Employe Binding on the Manufacturer.

In a decision written by Justice Laughlin, in which all of his associates concur, the New York Supreme Court, Appellate Division, just has decided "where a contract for the sale of an automobile provides for the payment of the balance of the purchase price after a certain trial period if it is found satisfactory, and the purchaser is induced by an employee of the vendor who is sent for the balance to pay the same, though the car is not satisfactory, upon his assurance that the vendor could and would make it satisfactory, the vendor is bound by this promise of its employee, regardless of whether he originally had authority to change the contract or make a new one, as he was then representing the vendor both with respect to performing its contract and requiring performance on the part of the vendee."

The decision, which is of a far-reaching nature and which alike affects manufacturers and dealers and their salesmen, was handed down in the case of the Dochtermann Van & Express Co., plaintiff-appellant, vs. Fiss, Doerr & Carroll Horse Co., defendant-respondent, which grew out of the purchase by the former, in 1907, of a two-ton Reliance truck.

In the lower court, the plaintiff was given a verdict, but the court set it aside and dismissed the complaint. It was from this judgment that the Dochtermann company appealed. The supreme court ordered that the action of the "court below" be reversed and the verdict be reinstated.

The purchase price of the truck in question was $2,500, the terms of payment providing for 20 per cent. cash with order and the balance within 15 days after date of delivery, the sale being subject to the following guarantee:

"The company agrees to make good by repairs or replacement within one year from first use any part showing defect in material or workmanship on said truck, provided the part is delivered to the company by buyer, transportation prepaid, and clearly shows defect and is tagged with truck or motor number from which taken and date of break. This guarantee does not cover breakage or the cost of repairing when damage is done by misuse, accident or neglect. Tires, coils and accessories are guaranteed by the various makers, to whom all claims must be made direct.

"It is further agreed that if at any time within 15 days from date of delivery the purchasers shall decide the truck to be unsatisfactory, the company will refund the purchase price, less $15 for every day truck was in operation.

"It is understood that the purchaser pays all operating and maintenance expenses during the 15-day trial period.

(Continued on page 10.)

Thomas Family Offers 30 Per Cent.

On "behalf of himself and his family," Edwin L. Thomas, son of E. R. Thomas, is making an effort to untangle the affairs of the E. R. Thomas Motor Car Co. of Buffalo, N. Y. To that end, he has offered the holders of what are known as creditors' extension notes, dated February 15, 1911, and subsequent notes, dated August 15, 1912, 30 per cent. of the face value of such paper. In making his offer, Thomas states that it is not probable that the receivership can be terminated within a year and that his proposal is made not only to give the creditors the advantage of immediate use of their money, but particularly "to unburden the property from the cumbersome effect of the trust agreement."

R. C. H. Discontinues Three Branches.

The R. C. H. Corporation of Detroit has discontinued its branches in Philadelphia, Minneapolis and San Francisco, its interests in each of those cities being turned over to well established dealers. The Philadelphia account was placed with J. Harry Schumacker, the Minneapolis agency with the Harvey Haynes Co. and the California representation with the H. O. Harrison Co., of San Francisco. The former R. C. H. branch managers have been designated district sales managers and will remain in their respective territories to handle the wholesale business.

Mezger Calls Grossman to Court.

C. A. Mezger, Inc., of Mount Vernon, N. Y., maker of "Soot-Proof" spark plugs, filed suit this week in the United States District Court for the Southern District of New York against the Emil Grossman Co., of New York City, maker of "Red Head" plugs, charging infringement of the Mezger patent, No. 700,147, granted to Minnie Mezger, May 13, 1902. The plug was invented by Charles A. Mezger, but the application was assigned to Minnie Mezger.

Pittsburghers Buy Bankrupt Penn Plant.

At the receiver's sale of the bankrupt Penn Motor Co. of New Castle, Pa., the real estate and plant was bid in by George Roth and J. M. Jack, of Pittsburgh. They paid $400 above the $50,000 mortgage on the plant.

FISK'S FIRST PREFERRED OFFERED TO THE PUBLIC

Statement of Output, Assets and Earnings Discloses Prosperous Condition of Tire Company—Capital Now $15,000,000.

Public offerings late last week of $3,000,000 of the Fisk Rubber Co.'s first preferred stock served to disclose the details of the enlargement of that company which has been in progress since October last, when it surrendered its Delaware charter and reincorporated under the laws of Massachusetts, at which time its capital was increased from $4,000,000 to $10,000,000. Preceding the new issue, the capital was again increased—this time to $15,000,000, divided as follows: Seven per cent. cumulative first preferred stock, $5,000,000; seven per cent. cumulative second preferred stock (convertible into common stock), $2,000,000, and common stock, $8,000,000.

The enlargement and semi-reorganization of the company will entail no change in its personnel. Harry T. Dunn remains president, John C. Cole vice-president and Harry G. Fisk secretary and treasurer. The board of directors, however, will be enlarged from three to five.

As Motor World of January 23 stated, John N. Willys, president of the Willys-Overland Co., has acquired a substantial interest in the Fisk company, but the control and direction rests with the Fisk-Dunn interests, which also have enlarged their holdings. Willys figures merely as an investor, and will take no active part in Fisk affairs. The prospectus offering the stock for sale states, however, that the Willys-Overland Co. has contracted to use a large quantity of Fisk tires during the next three years.

As disclosed by the prospectus, the output of the Fisk factory in Chicopee Falls, Mass., during the past five fiscal years, is as follows:

	Automobile casings or shoes.	Automobile inner tubes.	Bicycle tires.
1908	57,695	40,960	84,387
1909	78,259	59,077	103,085
1910	96,692	88,061	168,090
1911	125,279	121,584	207,561
1912	221,826	198,925	240,623

The enlargement of the plant now in progress will permit the output to be increased to 1,600 tires a day, affording, in round figures, a production of 400,000 automobile tires per year, to say nothing of several hundred thousand bicycle tires. Incidentally and interestingly, the prospectus brings out that renewals constitute 80 per cent. of the Fisk tire business.

During the past four years the company's net earnings, after depreciation, averaged

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$334,371, the amount for the last fiscal year, ending October 31st last, being $508,421. With the increased output and added capital, it is expected that the profits of the present fiscal year will show an increase of at least $250,000.

The total net assets of the company, as of October 31st last, aggregates $5,000,000. In this amount is not included goodwill, patents and trade marks, but it does include some $2,400,000 new cash capital which will be provided by the sale of the present issue of first preferred stock and otherwise. The assets are arrived at as follows:

Land, buildings, machinery etc., partly based on appraisal)		$1,037,636.82
Current assets:		
Inventory	$1,829,507.97	
Accounts and bills receivable	1,111,542.70	
Cash, including moneys to be provided by the present financing)	2,514,602.78	
Deferred charges	56,775.24	
	$5,512,428.69	
Deduct current liabilities	1,550,065.51	
Net current assets		3,962,363.18
Total current assets (exclusive of good will, patents, trade marks, etc.)		$5,000,000.00

The first preferred, of which only two-thirds already has been sold, is offered to the public at 102½ and accrued dividends, and it is figured that it will yield 6.83 per cent. net.

The company has no funded debt, and the stock issue is protected by provision that without the consent of three-quarters of the preferred stock the company can create no mortgages, bonds, notes or other evidences of indebtedness maturing within one year from the date of issue.

An annual sinking fund for the purchase or redemption of first preferred stock also is provided for. It will be created out of the earnings, the amount to be set aside during 1914 and 1915 to be equal to 7½ per cent. of the maximum amount of first preferred stock issued; thereafter annually an amount equal to 15 per cent. of the net profits of the company, but not less than 7½ per cent. of the maximum amount of first preferred stock issued.

Application will be made to list the Fisk first preferred on the Boston Stock Exchange.

Fire Fails to Stop Double Fabric.

The Double Fabric Tire Co., whose plant in Auburn, Ind., was destroyed by fire on the 8th inst., already has leased another building and secured the necessary equipment to permit of its immediate operation. The fire, therefore, will cause practically no interruption in the Double Fabric company's business.

FINDS A NEW WAY TO GET CAR AND OUTWIT REPAIRMAN

Owner Is Charged With Obtaining Car by Paying With Check and Then Stopping Check Payment—Third Parties Involved.

If the allegations of the complainants are provable, Raymond W. Marshall, a business man with an office in the Hudson Terminal Building, New York City, has turned up a new way of getting a car out of a repair-shop without paying the bill and without giving the repairman an opportunity to hold the car for his money; the scheme is merely to pay the bill with a check, no matter how much the bill is, and then before the repairman can get to the bank, stop payment on the check. A means of an inferior grade is to pay with a check the signature of which is scrawly or defective and which will not be honored by the bank.

The story is told in an action instituted in the New York City Court against Marshall by the Berg Auto Trunk & Specialty Co., of New York City, which, besides having a claim of $70.40 for goods sold to Marshall, now holds the checks in question. In the Berg deal, also, a check figures; Marshall claims he paid $25 on his bill, but the complainants allege that his payment was made with a check and that it was returned to him.

Figuring most prominently in the transaction is a check for $647.50 which Marshall is said to have given to Duhamel & Brucker, Brooklyn repairman. Marshall states that about a year ago they agreed to repair his car for $300, but that when he went for it he was in great haste to start on a tour, and having no ready means of checking up the bill which was presented, paid it, the amount being $647.50. He further states that as soon as he got to his office, where information was available, he checked up the bill and found it not correct. He does not deny having stopped payment on the check. After this he went on a tour. For alleged faulty work he asks $250 damages.

Another check, for $9.50, made out to N. Engwall for work done on the side, also is in the possession of the Berg company and is claimed to have been turned down by the bank because of the nature of the signature. A total of $728.65 is asked by the complainant.

Dressmaker Sues Pneumatic Transmission.

Mary S. Clark, a dressmaker, who invested a part of her savings in the Universal Pneumatic Transmission Co., a Maine corporation, the headquarters of which are in Chicago, Ill., has instituted suit in the Federal court in that city to compel the Pneumatic concern to render an accounting. The dressmaker alleges that on the representations of Charles I. Backus, president of the company, she paid $1,237.50 for 10,000 shares of Universal Pneumatic stock, but when her several requests for information and an accounting were refused, she resorted to law.

Kaufman Wants $10,600 of Indian Money.

The Indian Refining Co. may have what it regards as good and sufficient reasons for not selling as much oil to L. J. Kaufman, Inc., a New York City automobile supply dealer, as it agreed to sell, but the Kaufman company claims a contract which was made November 22, 1912, was broken without cause and asks $10,602.50 in a suit which it filed this week in the Supreme Court for New York county. According to the complaint, 1,500 barrels of No. 3 pale lubricating oil were to be supplied at 13 cents a gallon in the year beginning December 1, 1912, and 20 barrels of No. 3 and 5 of No. 2 red lubricating oil are said to have been delivered December 27, after which there was refusal to deliver more. The barrels each contained 50 gallons and shipments were to be not less than 25 nor more than 50 barrels.

Ewing Now Appears in Findlay Sale.

Who purchased the plant of the bankrupt Findlay Motor Co. of Findlay, Ohio, when it was sold by the receiver last month, appears to be something of a question. At the time of the sale, it was stated that the property had been bid in by J. G. Cleary, of Milwaukee, for $50,000, it being Cleary's announced intention of dismantling the plant and removing the machinery to Milwaukee. Later, however, it was stated that the Milwaukeeian had transferred his bid to W. W. Edwards, president of the Buckeye National Bank of Findlay, but, despite the transfer, on Saturday last L. E. Ewing, the former president of the Findlay Motor Co., over his own name, advertised the equipment "for a quick sale at a ridiculously low figure." He also offered to arrange terms for partial payments and expressed his willingness to take stock in a new organization for part of the purchase price.

Munger to General Manage K-D Motor.

L. D. Munger has assumed the general management of the K-D Motor Co., of Boston, which was built around Miss Margaret Knight's crescent valve motor. Munger acquired an interest in the company several months ago, but hereafter will devote a part of his activities to its affairs, at the same time retaining his holdings in the Moore & Munger Co., one of New York's famous body building establishments.

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The Week's Incorporations

Hagerstown, Md.—Antietam Garage Co., under Maryland laws; authorized capital, $5,000; to operate a garage.

Marquette, Mich.—Cloverland Auto Co., under Michigan laws; authorized capital, $15,000; to deal in motor cars.

San Francisco, Cal.—Latham Auto Supply Co., under California laws; authorized capital, $25,000; to deal in motor car supplies.

Sanger, Cal.—King's River-Hume Auto Service Co., under California laws; authorized capital, $15,000; to operate a motor stage line.

Los Angeles, Cal.—Quartette Automobile Signal Co., under California laws; authorized capital, $100,000; to manufacture motor car devices.

Harrisburg, Pa.—Watts Wagon & Automobile Co., under Pennsylvania laws; authorized capital, $5,000; to deal in vehicles. Corporators—F. N. Watts and others.

Spokane, Wash.—Main Street Garage Co., under Washington laws; authorized capital, $10,000; to operate a garage. Corporators—R. B. Hatley, A. L. Reid, Emily O'Kelley.

Wilmington, Del.—Colonial Tire & Rubber Co., under Delaware laws; authorized capital, $250,000; to manufacture tires. Corporators—F. D. Buck, G. W. Dillman, B. M. Grawl.

Brookville, Ohio—Brookville Auto Co., under Ohio laws; authorized capital, $10,000; to deal in motor cars. Corporators—J. Ward Somers, Edward S. Somers, V. T Somers.

Omaha, Neb.—Stewart-Toozer Motor Co., under Nebraska laws; authorized capital, $25,000; to deal in motor cars. Corporators—John T. Stewart, George E. Toozer and others.

Bowling Green, Ky.—Monroe Motor Co., under Kentucky laws; authorized capital, $2,500; to deal in motor cars. Corporators—Ida B. Monroe, Harry G. Monroe, George W. Monroe.

Dayton, Ohio—Dayton Top Improvement Co., under Ohio laws; authorized capital, $10,000; to manufacture tops. Corporators—C. C. Blackmore, Jean C. Blackmore, H. E. Randall.

Seattle, Wash.—Enterprise Auto Repair Co., under Washington laws; authorized capital, $10,000; to operate a motor repair shop. Corporators—H. O. Hollenbeck, R. W. Smailes.

Cleveland, Ohio—Motor Car Service Station Co., under Ohio laws; authorized capital, $10,000; to operate a service station. Corporators—Paul S. Knight, M. Marquard, Don P. Mills.

Brockton, Mass.—City Garage Co., under Massachusetts laws; authorized capital, $5,000; to operate a garage. Corporators—Bernard B. Winslow, Daniel Winslow, Arthur W. Curtis.

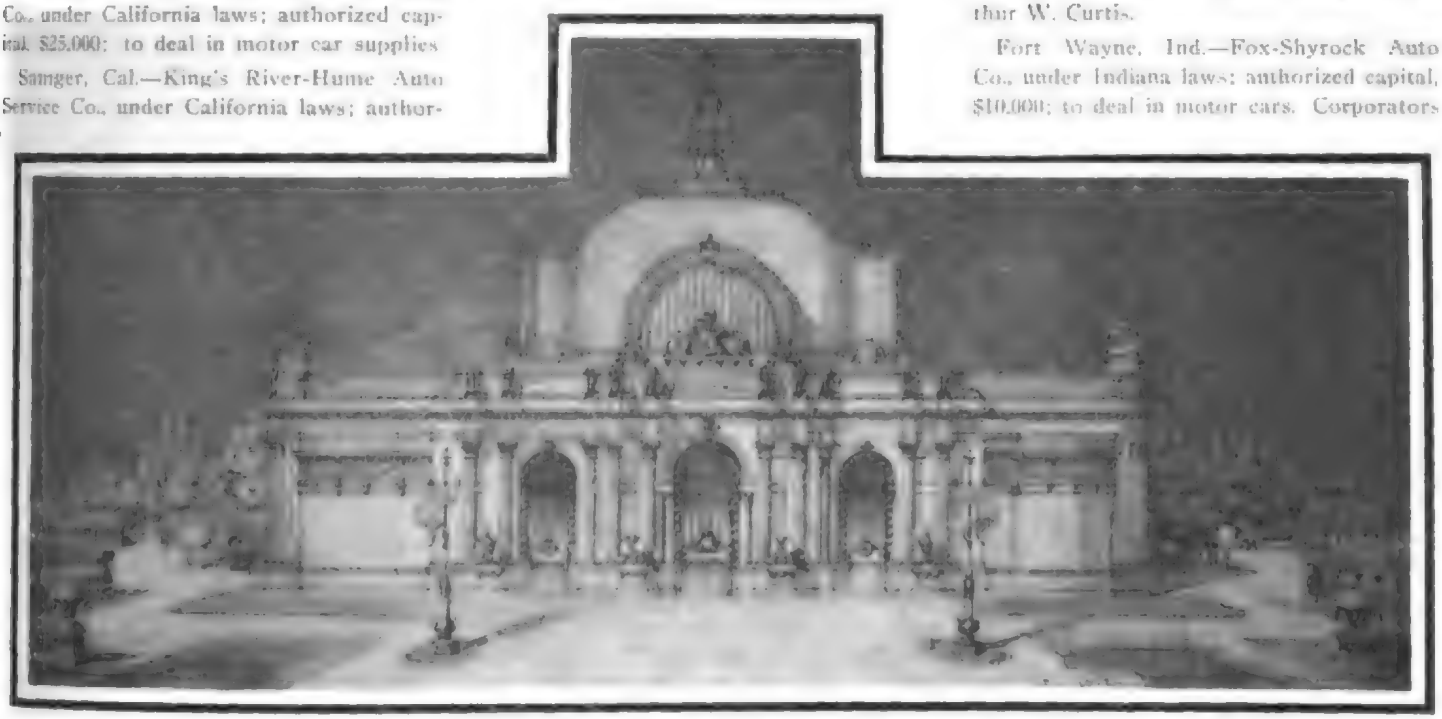
Fort Wayne, Ind.—Fox-Shyrock Auto Co., under Indiana laws; authorized capital, $10,000; to deal in motor cars. Corporators—William W. Shyrock, Bartlett W. Shyrock, George T. Fox.

Cleveland, Ohio—Motor Van Delivery Co., under Ohio laws; authorized capital, $10,000; to operate a motor delivery. Corporators—Elizabeth G. Stewart, S. T. Stewart, John R. Cautner.

Wilmington, Del.—Carels Diesel Motor Co. of America, under Delaware laws; authorized capital, $10,000,000; to manufacture motors. Corporators—H. E. Latter, W. J. Maloney, N. P. Coffin.

Columbus, Ohio—New Columbus Automobile Co., under Ohio laws; authorized capital, $30,000; to deal in motor cars. Corporators—Jesse J. Brown, Lillian E. Brown, William E. McCannon.

New York, N. Y.—Acr-Oid Rubber Substitutes Co., under Delaware laws; authorized capital, $500,000; to manufacture rub-



DESIGN OF "AUTOMOBILE PALACE" FOR PANAMA-PACIFIC EXPOSITION IN 1915

Special building, measuring 350 x 600 feet, which is to be erected in San Francisco to house exhibits of automobiles and accessories.

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her substitutes. Corporators—L. A. Sorensen, M. Friedberg, C. A. Brown.

Cleveland, Ohio—Standard Shock Absorber Co., under Ohio laws; authorized capital, $100,000; to manufacture shock-absorbers. Corporators—C. D. Sward, Wm. Leary, G. D. Sward, Naomi M. Leary, A. A. McGill.

New York, N. Y.—Veerac Motor Truck Co., under New York laws; authorized capital, $10,000; to deal in motor trucks. Corporators—Harry B. McGinley, 761 East 24th street; Edward L. Whittemore, 139 St. James place, Brooklyn; George H. Hinnau, 165 Broadway.

New York, N. Y.—Maxim Tricar Mfg. Co., under New York laws; authorized capital, $100,000; to manufacture motor cars. Corporators—Otto Kuhneman, 2084 Broadway; Charles F. Novotny, 660 Dawson avenue; A. A. Meschutt, 43 Liberty tsreet, Ridgewood, N. J.

New York, N. Y.—Auto Center, Inc., under New York laws; authorized capital, $25,000; to deal in real estate for use in the motor car business, such as garages, show rooms, etc. Corporators—Edward W. Forrest, Charles H. Fuller, Byron C. Thomas, all of 290 Lenox avenue.

New York, N. Y.—John Splitdorf Corporation, under New York laws; authorized capital, $350,000; to manufacture electrical equipment for motor cars. Corporators—John Splitdorf, 1427 Doris street; P. J. W. Kelly, 137 Duncan avenue, Jersey City, N. J.; A. L. Kull, 42 West Castle Place, New Rochelle, N. Y.

Minor Business Troubles.

A petition in bankruptcy was filed this week in the Federal court in New York City against Cruice, Keelan & Co., taxicab operators at 143 East 23rd street, it being stated that there are more than twelve creditors. The petitioners and their claims are: Mark Cowles, trading at Mark Cowles & Co., automobile supplies, $116.30; Ray Locke, salary, $25; American Taximeter Co., rental of taximeters, $567.50.

Edgar A. Bloch, of 343 St. Nicholas avenue, New York City, a former automobile dealer, this week filed a voluntary petition in bankruptcy, showing liabilities of $2,149 and no assets; among the creditors and debts are: Broadway Auto Accessories Store, Inc., $539; La Ruin Auto Importing Co., $859, and Moto Bloc Import Co., $227.

A petition for a receiver for the Jennings-Sherwood Auto & Carriage Co. has been filed in the court in Bridgeport, Conn., by Sarah L. and George S. Jennings; they state that they own more than one-tenth of the stock of the company and that its assets are liable to waste and deterioration through attachments.

PROMINENT MEN IN TRADE WHO ASSUME NEW DUTIES

Resignations and Promotions That Serve To Place Many Workers In New Places—Few Leave the Industry.

H. W. Hall has been appointed manager of the Boston branch of the Universal Motor Truck Co. of Detroit.

H. S. Shaffer has been elected treasurer of the Keeton Motor Co., of Detroit. He is a brother of C. D. Shaffer, the well-known and wealthy oil producer who already is largely interested in the Keeton enterprise.

Roy G. Harris has been appointed assistant advertising manager of the Firestone Tire & Rubber Co. of Akron, Ohio. Previously he was sales and publicity manager of the Vreeland Chemical Co. of New York.

H. H. Robinson has been appointed assistant director of sales for the Keeton Motor Co., of Detroit. He is new to the automobile industry, although he had acquired a reputation in the telephone business.

D. C. Hathaway has been appointed manager of the branch which the Kelly-Springfield Motor Truck Co. recently established in Cleveland. Previously Hathaway was manager of the Dayton Auto Truck Co. of Dayton, Ohio.

George L. East has been appointed assistant advertising manager of the Timken Roller Bearing Co. and the Timken-Detroit Axle Co. Formerly he was director of advertising for the Olds Motor Works and later for the Amplex Motor Car Co.

J. L. White, for four years purchasing agent of the Northway Motor & Mfg. Co. of Detroit, whose motors are used in Cole cars, has assumed similar duties and a similar title in the Cole Motor Car Co. of Indianapolis. He succeeds E. E. Westman.

J. J. Meade has been appointed superintendent of the engine building department of the Moon Motor Car Co. of St. Louis. He is experienced in that work, having performed similar duty for both the Packard and E. R. Thomas companies for a period of several years.

R. L. Lockwood, formerly an assistant district manager for the Willys-Overland Co., has been promoted to the post of supervisor of district managers in the Eastern territory. His domain includes New York, Pennsylvania, Maryland, Virginia, the New England States and Eastern Canada.

C. A. Carey has been appointed purchasing agent for the Chandler Motor Car Co., of Detroit. Like all of the other officials and department heads of that new enterprise, Carey previously was identified with the Lozier Motor Co. He had charge of its purchasing department.

E. E. Westman has resigned the post of purchasing agent for the Cole Motor Car Co. of Indianapolis to take up similar duties for the Henderson Motor Car Co. of that city. Before becoming connected with the Cole organization Westman was identified with the Weston-Mott Co. of Flint, Mich.

James Joyce, formerly sales manager for the Southern Motor Vehicle Co. of Rochester, N. Y., and one of the genuine veterans of the automobile industry, has been appointed manager of the Philadelphia branch of the Kelly-Springfield Motor Truck Co. The branch is located at 4518 Baltimore avenue.

E. J. Kulas has been appointed general sales manager of the Peerless Motor Car Co., of Cleveland. He is a new comer in the automobile industry, but acquired a reputation as secretary and general manager of the Brilliant Electric Lamp Co., of Cleveland, one of the largest producers of incandescent lamps in this country.

Recent Losses by Fire.

Casper, Wyo.—Richards Garage, garage damaged. Loss not given.

Madelia, Minn.—Forstner Bros., garage damaged. Loss not given.

Toledo, Ohio—Ray Kuhn Co., accessories stock damaged. Loss not given.

Lewiston, Me.—Nelke & Partridge, Central Garage, destroyed. Loss, $25,000.

Milton, Mass.—William B. Stearns, garage and cars destroyed. Loss not given.

St. Paul, Minn.—C. S. Neutson, supply dealer, 7th street, stock and building damaged. Loss, $25,000.

Kansas City, Mo.—Admiral Auto Livery, 715 Lydia avenue, building and contents damaged. Loss, $1,500.

Milwaukee, Wis.—Manhattan Garage & Express Co., 270-74 27th street, garage and 23 cars destroyed. Loss, $65,000.

New York, N. Y.—Independent Garage Owners Co., 205 West End avenue, garage and 50 cars destroyed. Loss, $100,000.

Washington, D. C.—David Hendrick, 1315-19 H street, northwest, building damaged and several cars destroyed. Loss, $9,000.

Kansas City, Mo.—Winton Motor Carriage Co., 3324-26 Main street, and Franklin Automobile Co., 3320-22 Main street, building, fixtures and 33 of Winton company's and 12 of Franklin company's cars destroyed. Loss, Winton, $125,000; Franklin, $25,000.

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In the RETAIL WORLD

Otto Baumann of Lake Wilson, Minn., is erecting a new garage.

F. E. Bates is making ready to erect a garage in Northfield, Minn.

A new garage is being erected for Shaffer & Lounsbury in Merced, Cal.

W. D. Jackson is about to open a garage and machine shop in Waxahachie, Tex.

P. G. Lederbach has secured a site in Buffalo, Minn., and will build a garage.

A new garage is being erected in Carthage, Ill., for the Auto & Carriage Co.

L. E. Rogers of Sandwich, Ill., is about to open a garage in Leland, in the same State.

Richard Welland is building a garage in Marblehead, Mass. It is located on Atlantic avenue.

Jonas D. Emery of Concordia, Kan., has purchased the automobile business of John Stewart.

A. N. Barnes has sold the Libby Motor Co., in Santa Ana., Cal., to I. M. Von Schriltz.

Aaron Juens has leased a newly constructed building in Marshall, Ill., and will open a garage.

Joel F. Batt is erecting a concrete garage, 36 x 48 feet, in Pen Argyl, Pa. It is located on E street.

Ruth & Smith is the style under which a new supply firm is about to open up in Downs, Kan.

Howard Tracy has entered the trade in Ashland, O. He is trading under the style Central Garage.

George A. Stilling has entered the trade in McHenry, Ill. He will sell Hupmobiles and Veerac trucks.

A. A. Wedgewood, formerly of Sioux City, Ia., has removed to Madison, N. D., where he will open a garage.

J. E. Hansen, a dealer in Bloomington, Ill., has withdrawn from the trade; he had the Warren-Detroit agency.

The Schofield Auto Co. has been formed in Provo, Utah, and will handle Ford cars; F. L. Schofield is manager.

Lewis & Drye, of Bradfordsville, Ky., are about to open a garage and repair shop in Lebanon, in the same State.

Robert W. Lehr has opened a garage in Paola, Kan. He has the location formerly occupied by the City Garage.

The Horton Auto Co., of Fennimore, Wis., has let the contracts for a new garage; the company has the Ford agency.

G. L. Schultz, Albert True and Edward Kaifer have formed a co-partnership in Henry, Ill., and will handle the Velie.

F. W. Gilman, a real estate broker in Portersville, Cal., has become an automobile dealer; he has the Marathon agency.

John Jones of Oakley, S. C., is about to open a garage in Walterboro, in the same State; he also will conduct an agency.

Floyd P. and Raleigh L. Harris plan to establish a garage business in Galva, Ill. The style will be Harris Bros. Garage.

Charles W. Ellis has had plans prepared for a new garage which he will have erected in Greenville, N. C. It will cost $4,000.

G. Harold Fanning, of Brooklyn, will enter the trade in Smithtown, Long Island, N. Y., March 1; he will handle the Stutz.

The Tom Botterill Automobile Co., of Salt Lake City, Utah, has added a supply and accessory department to its business.

Walters & Hand have opened a garage in Wheeling, W. Va., on Elm street; they will handle several makes of car, including the Overland.

The Motor Vehicle Sales Co. has opened new salesrooms and a garage on Farmer's avenue, Kalamazoo, Mich. The concern is Buick dealer.

Adolph J. Nus and W. U. Mussina have formed the N. & M. Motor Co. in Williamsport, Pa. They will locate at 141 West Church street.

Kennedy Bros., of Pratt, Kan., have taken over the Bell Garage in Dodge City, in the same State; the firm comprises H. J., W. E. and B. L. Kennedy.

The Mountain City Garage Co., of Altoona, Pa., has located a new garage at 9th avenue and 12th street; the establishment includes a machine shop.

J. M. Lawrence of San Jose, Cal., has taken a dealership; he represents the Jackson line in Santa Clara, Santa Cruz, Monterey and San Benito counties.

Clarence Funkey plans to open a new garage in Hancock, Mich., this coming summer; a livery service which he started about a year ago is to be extended.

Fred R. Young, of Moline, Ill., opened a new garage last week, the opening taking the form of a dance; the two floors each have 7,000 square feet of floor space.

Charles Mackey has purchased of George Bentel a half interest in the Pacific Coast agencies for the Mercer and Simplex cars; the headquarters are in Los Angeles.

Leonard Wyeth has purchased the James L. Bush Garage in Tuscola, Ill. The business includes the Ford and Rambler agencies for Douglas and Moultrie counties.

Arthur Staack has bought the interests of the latter named partner in the garage form of Hamann & Schumacher, in Guttenberg, Ia. The new firm is Hamann & Staack.

J. L. Teberg of Taylor, Tex., has sold the Texas Garage on West 4th street to E. B. Garess; Garess also owns the Taylor Garage, on West 2nd street, and will operate both.

J. C. McDonald and Joseph Atherton, owners of the M. & A. Garage, on North Lafayette street, Macomb, Ill., have purchased the Stocker Garage; they will operate both.

The W. J. Burt Motor Car Co., of Los Angeles, Cal., has completed a new garage and salesrooms; they are located at Pico and Hope streets. The company handles Auburn cars.

C. T. Bernhardt, formerly connected with the Gardena (Cal.) Garage, has branched out for himself; he plans to establish a garage and repair business in that town near Wilmington road.

Thomas Trewet, of Sibley, Ia., has disposed of his garage and machine shop to John Shunick and R. Dimmick; the business was exchanged for land in Colorado, which Trewet will work.

The Whittlesey Garage & Machine Co. has been organized in San Benito, Tex. The incorporators are C. W. Whittlesey and James T. and James F. Valentine; a garage and machine shop will be opened.

The T. G. Northwell Co., a dealer in Sioux City, Ia., which was burned out recently, has arranged to resume business; temporary quarters have been secured in the Haakinson & Beaty building.

Charles C. Collins and Tom S. Davidson have formed a copartnership and have opened up in Denver, Col., at 1633 Court place, under the style National Rubber Sup-

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ply Co. They will handle accessories and Revere tires.

Lamping & Garfield, of Seattle, Wash., are about to establish a branch in Tacoma, in the same State; they will erect a new building, 50 x 120 feet, at a cost of $4,000. The firm is distributer of Flanders cars.

H. V. Maresch, of Taylor, Tex., has sold the Star Garage, on East 5th street, to Nowlin & Caswell. T. J. Caswell, one of the partners, is from Georgetown, Tex., and the other, Daniel Nowlin, from Circleville, in the same State.

H. J. Hilliard has purchased the Hoganson & Fruland Garage, in Ottawa, Ill., which he formerly operated. Hoganson & Fruland at the same time bought the Ottawa Garage on Columbus street from Walter Mers, J. O. Laugman and Jesse West.

The Cadillac Sales Co. has been organized in Knoxville, Tenn., and has contracted for the erection of a garage and salesrooms at Gay and Main streets; the members of the company are E. C. Mahan, Benjamin A. Morton, A. M. Stewart and T. T. Pace, the latter of whom will act as manager.

Ackerman & Baird have opened one of the largest garages in Brooklyn, N. Y., at 2 Keap street; they will handle the Mercer, but their salesrooms will be located elsewhere. R. P. Ackerman, one of the firm members, was with the I. S. Remson Mfg. Co., Brooklyn agents for the Locomobile and Abbott-Detroit, for four years, while Baird is the son of the proprietor of one of Brooklyn's large stores.

The Thomas Motor Car Co. and the Carpenter Motor Sales Co., both of Los Angeles, Cal., have combined under the name Thomas Motor Car Co. of California. The officers are: President, A. M. Young; vice-president, Lee R. Carpenter; treasurer, J. F. Scott; secretary, E. O. Hanson; retail sales manager, L. A. Pratt; service manager, William F. Lloyd. The new company handles the Paige-Detroit car and the Lippard-Stewart truck and is located at 11th and Flower streets.

The Central Iowa Motors Co., of Des Moines, Ia., has taken over the Van Vliet-Bradt Auto Co., and will remove from 706 Mulberry street to the Van Vliet-Bradt location at 919 Locust street; the change adds the Moon distributing agency to those of of the Hupmobile and American, heretofore held by the Central Iowa company, and an extended distribution is planned. F. S. Cummings, vice-president and sales manager of the Central company, will manage the new business, and the Des Moines dealers, Steele & Shaw, also will locate at 919 Locust street. W. J. Bradt will continue with the Herring Motor Supply Co. and C. G. Van Vliet will engage in other business.

HOLDS PATENTEES CANNOT CONTROL RE-SALES PRICES

Federal Judge Delivers Hard Blow in Unexpected Direction—The Points Involved and a Patent Lawyer's Opinion.

Until it has been digested by their legal advisers, or until a higher court has confirmed his opinion, lawyers versed in patent causes express the belief that it will not be safe for dealers handling patented articles to assume that the decision of Judge Ray, of the United States District Court for the Northern District of New York means that they are free to disregard the prices fixed thereon.

Judge Ray's decision was handed down on Monday last, 17th inst., and as it apparently holds that a patentee has no right to fix the re-sale price of his goods, and that he otherwise relinquishes control after their manufacture, it created a tremendous sensation in practically all lines of industry. The demand for copies of the decision—an unusually voluminous one—has been so great that it has not been possible to supply it.

The suit which brought about the decision is that of the Waltham Watch Co. of Waltham, Mass., vs. Charles A. Keene, a New York jeweler, who long had cut Waltham prices and otherwise flouted Waltham authority. He was taken into court on a charge of patent infringement, the infringement consisting of having violated the price fixed on the Waltham movement.

This patented watch movement is sold with what is termed the "Waltham Contract Notice" attached to it, the "notice" differing, however, from the usual conditional patent license which is commonly used in the sale of Victor talking machines, Edison phonographs, Klaxon horns and other patented articles. The Waltham "notice" declares that the article to which it is attached is sold subject to certain stated conditions which every buyer thereof agrees to perform, and goes on to say that "breach of any of these conditions shall revest in the company the title to this movement and upon tendering the price paid therefor to the holder thereof, the company may retake possession of the same. These conditions will be enforced by the company."

In the usual license agreement it is usually stated that the license for use and sale is conditional and that breach of conditions terminates the license and constitutes an infringement of the patents.

George Cooper Dean, a New York practitioner who is eminent in the domain of patent cases and conditional licenses, states that attorneys who are familiar with the law governing the latter are of opinion that breach of the Waltham contract of sale belongs to the law of contracts, and that the contract, as such, may be a violation of the Sherman act, as decided by Judge Ray.

(Continued on page 26.)

Rajah Wins a Case, Loses a Point.

Selling imitation Rajah spark plug porcelains was the point at issue in two actions in the United States District Court for the Southern District of New York which were this week decided, one for and the other against the Rajah Auto Supply Co., of Bloomfield, N. J., the latter company being the complainant in both cases.

The action decided favorably to the Rajah company was against the American Auto Supply Co., of Buffalo, N. Y., which was charged with selling porcelains to fit the Rajah company's plugs; the court directed the issuance of an injunction restraining this practice as an infringement of the Rajah patent, No. 825,856.

The other action was against the Emil Grossman Co., of New York City, against which the Rajah company obtained an injunction about a year ago, and the request was that the Grossman company, charged with having sold porcelains to fit Rajah plugs following the enjoining, be adjudged in contempt of court. The judge refused to grant this motion, expressing a belief that the Grossman company had not intentionally violated the court order. An appeal will be taken.

Coloradoans to Make Tires in California.

According to reports from Denver, the W. C. Hendrie Rubber Co., of that city, has purchased a six-acre site in Torrence, a suburb of Los Angeles, Cal., on which will be erected an automobile tire plant at a cost of $100,000. The Hendrie company is producing leather belting and steam packing in its plant in Denver, but has found that the dryness of the Colorado climate makes it impracticable for crude rubber to be stored there; hence the choice of Los Angeles as a site for the proposed tire factory.

Chain Makers Prosecute Supply Dealers.

The H. Channon Co., of Chicago, makers of tire chains, filed judgment for $272.02 this week in the New York county clerk's office against Violet V. Sullivan and Benjamin Sullivan, Jr., who trade in Brooklyn, N. Y., as the Bay Ridge Auto Supply Co. The suit preceding judgment was in the Municipal Court.

Metz Adds $50 to Price of Runabout.

The Metz Co., of Waltham, Mass., has increased the price of its 22-horsepower runabout to $445. Previously it listed at $395.

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NEW YORK, FEBRUARY 20, 1913

"SOAKING THOSE AUTOMOBILE 'FELLERS.'"

The general change in political complexion of the various State legislatures which followed the over-turning election of last November is having a natural result. Always a popular legislative pastime, tinkering with automobile laws has become almost epidemic.

The many men who for the first time find the title "Hon." placed in front of their names are feeling their responsibilities, and in an endeavor to live up to them, and to prove their usefulness to their respective constituents, what is simpler than "soaking those automobile 'fellers.'" The deluge of new bills and of amendments to existing laws, which range from grave to gay, is so great as to indicate that the secretary of state, or the member of the legislature who has not offered at least one such measure is lacking in either a sense of humor or a sense of duty.

With comparatively few exceptions, all of the law-compounders who have "seen their duty and done it" apparently are agreed that the one way to make the highways safer is greatly to increase the amounts of the license or registration fees, or both, which are imposed on automobilists. The fact that no other vehicle which uses the roads pays one cent for such use is not permitted to enter legislative halls, where, evidently, it is never realized that roads were destroyed before automobiles were thought of and that it hurts as much to be injured by a horse-drawn vehicle as by any other, and that persons can be killed quite as dead by one as by the other.

The idea that piling on the fees and increasing the restrictions on automobiles, which has obtained for so many years, constitutes a cure-all still obtains. Even New York's new governor and new secretary of state, both apparently well-meaning men, are possessed of the notion that the fees should be largely increased, not as a matter of justice but, according to the secretary of state, because owners of automobiles can afford the increase, or, according to the governor, because the State "needs the money."

Despite the fact, it is not too much to hope that some day, at least, in the far distant future, there will arise a legislator who is wise enough and fair enough to insist that all road users shall be treated alike, and who will recognize that the measures which will most effectively add to the safety of the highways are those that will reduce the small boy peril and that will require the use of lamps—and, perhaps, numbers—on all vehicles of whatever nature.

BENEFITS OF REMOVABLE TRUCK BODIES.

It is one of the plainly noticeable tendencies of the commercial vehicle industry that the demountable or detachable type of truck body steadily is increasing in popularity. The development is logical, of course, if true efficiency, which necessitates the constant employment of the vehicle, be considered, for the removable body eliminates a great portion of the "dead" time represented by loading and unloading operations.

There is another angle of the situation, however, which is, perhaps, not so plainly apparent and to which little attention has been directed despite its evident importance. The demountable body virtually lifts the motor truck out of the long haul rut where it really has belonged prior to the advent of the removable superstructure, and has made of it a double purpose vehicle which is equally applicable, with economy, to either long or short haul work. That is to say, the demountable body for short haul work has reduced the ratio of the time on the road, when the truck actually is performing useful work, to the time lost in loading and unloading operations, to the point where it is even lower than is the same comparatively low ratio in long haul work where the non-demountable body is employed.

Incidentally, the removable body permits of the alluring possibility of employing several different types of bodies for different kinds of work, and here again it increases efficiency in general, for efficiency of the highest kind requires specialization, and specialization in the transportation of full loads of, say, coal on one trip and wood on the next, is impossible with one style of non-demountable body.

In at least one respect, the national shows proved that the lessons of real salesmanship gradually are being heeded by the trade. There no longer is that promiscuous or indiscriminate distribution of catalogs which once was the rule. Instead most of those who asked for catalogs—car catalogs, at least—were requested to leave their names and addresses, to which the desired literature would be forwarded later. Manufacturers have reason to realize that catalogs cost money, and they also appreciate the value of obtaining names and addresses.

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LUBRICATING OIL PRICES FOLLOW CRUDE OIL UPWARD

Advances in Crude Petroleum Cause Two and Three Cents Increase in Lubricants—Crude Raised 80 Per Cent. in Year.

Marked advances which have been made in the prices of crude oils within the last few weeks have made themselves felt in the lubricating oil field, and this commodity now stands generally about two cents higher than it did at the opening of the new year, the advance in some instances being three cents; the change, on the whole, makes difficult a concrete and detailed enumeration of specific alterations because of the numerous prices that apply in the oil trade, there being a wide range from the individual consumer to the manufacturer and the small and large garageman and the varying grades of manufacturers being the intermediate stations in the price scale.

To cite an instance, the Wolverine Lubricants Co., on January 5, made an increase of two cents in practically all of its prices and did not confine the raise to different grades, as have some of the other companies, among them the Columbia Lubricants Co. of New York, maker of Monogram oil, which made its principal increases in the lower grades of gasoline engine oils; in the higher priced grades of oils the changes were not so great or so numerous, and at the office of the Standard Oil Co. it was stated that no change had been made and that Polarine Oil, its leading commodity in the lubricating line, remains as before the recent agitation in the crude field.

The jump in the price of the crude product has as one reason the "supply and demand" story, while there are those who claim to be familiar with petroleum products who declare the agitation is of purely artificial origin and that the increases have been made with a well defined purpose in certain quarters. By others it is said to be a fight by the refiners for better prices. To the lay mind the fact that certain grades of crude oil jumped at the rate of about five cents a jump and that the jumps were but two or three days apart is at the best bewildering when an attempt is made to recognize a congruity in the relations between price and supply and demand.

Within about a year crude oil has increased about 80 per cent. in price. The figure per barrel at the beginning of this period, taking a certain grade of Pennsylvania oil which is recognized as a standard for price variations, was $1.30, but advances have brought this up until the price now stands at $2.33.

The undue activity in crude oil has given rise to anticipations that the advance in the price of gasolene from 16 to 17 cents made by the Standard Oil Co. January 1 would be followed by a further increase, and predictions and rumors have said the next advance wolud be to 19 cents, but the Standard company apparently has been so busy distributing its recent $50,000,000 "melon" that it has not had time to tickle the gasolene frog sufficiently to cause such an able leap.

Mitchell Terminates Old Insurance Suits.

In order to stop four lawsuits which were not more than officially half started a year ago, it was necessary this week for the Mitchell-Lewis Motor Co., of Racine, Wis., to file the suits officially in the Supreme Court for New York county and at the same time file orders of discontinuance. The actions grew out of a fire in the Mitchell-Lewis plant about two years ago, and following a dispute as to the insurance, suits were partially launched against the Northwestern Insurance Co., the Liverpool Victor Insurance Co. of England, the Regal Insurance Co., the Liverpool Victor Insurance and the Essex & Suffolk Insurance Co. However, before the proceedings attained any importance, the matter was settled, but it was not until this week that the cases were closed up in the court records.

Sign Brings Toplitz Double Publicity.

There are two ways in which an electric sign can bring a man's business before the public, as can be attested by Bert L. Toplitz, president of the Allenhurst Garage Co., of 135 West 37th street, New York City; one way is to put the sign in place and have it illuminated at night, the other is put up the sign and have the maker sue for its value. Toplitz acknowledges financial embarrassment at the present time, and when the Federal Sign System took the matter into the Municipal Court, judgment for $68.08 was secured and when he filed to adjust matters he was summoned into the New York City Court in supplementary proceedings. This week the court granted an attachment bailable in the amount of $50, the unpaid portion of the bill being $58.08.

Michigan Men Launch Admiral Truck.

Having secured the necessary financial support, Earl Porter, Don E. Evans and H. G. Dewey have organized the Admiral Auto Co. in St. Louis, Mich., and will devote themselves to the manufacture of a half-ton truck that will list at about $900. Later they will also produce a light farm tractor. The Admiral company, which will be capitalized at $50,000, will start in a comparatively small way, probably with a working force of about 20 men.



February 15-22, Albany, N. Y.—Annual show of the Albany Automobile Dealers' Association in the State Armory.

February 15-22, Newark, N. J.—New Jersey Exhibition Co.'s Sixth annual exhibit in the First Regiment Armory.

February 16-23, Richmond, Va.—Richmond Automobile Dealers' Shows Co.'s exhibit in the Horse Show building.

February 17-27, Kansas City, Mo.—Kansas City Automobile Dealers' Association's show in Convention Hall. First week pleasure cars; second week commercial vehicles.

February 18-22, Baltimore, Md.—Baltimore Automobile Dealers' Association's annual show in the Fifth Regiment Armory.

February 19-22, Kalamazoo, Mich.—Kalamazoo Automobile Dealers' Association's annual show.

February 19-22, Davenport, Ia.—Annual show of the Tri-City Automobile Dealers' Association in the Coliseum.

February 19-22, Oshkosh, Wis.—Oshkosh Automobile Dealers' Association's second annual show in Armory B.

February 20-22, Canandaigua, N. Y.—Motor Car show in Hawley's Garage, under the management of A. Blumenstein.

February 22-March 1, Brooklyn, N. Y.—Brooklyn Motor Dealers' Association's annual show in the 23rd Regiment Armory.

February 24-March 1, Omaha, Neb.—Omaha Autmobile Dealers' Association's annual show.

February 24-March 1, Cincinnati, Ohio—Third annual show of the Cincinnati Automobile Dealers' Association in the Cincinnati Music Hall.

February 25-28, Topeka, Kan.—First annual show of the Kansas Motor Show Co.

February 26-March 1, Fort Dodge, Ia.—Second Annual show of the Fort Dodge Dealers' Association in Armory.

March 1-8, Paterson, N. J.—Second annual show of the Paterson Automobile Dealers' Association.

March 8-15, Boston, Mass.—Boston Automobile Dealers' Association's annual show in Mechanics' Hall. Pleasure cars only.

March 19-25, Boston, Mass.—Boston Commercial Vehicle Association's annual show in Mechanics' Hall.

March 3-8, Pittsburgh, Pa.—Pittsburgh Automobile Dealers' Association's show in Duquesne Garden.

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FRANCE'S RATING FORMULA PROVOKES KEEN DERISION

Recently Adopted Plan, Which Taxes Piston Displacement, Styled a "Mess" and a "Catastrophe"—How It Works Out.

Whether or not the formula recently adopted by the French Department of Mines for the determination of the taxable horsepower of motor car engines eventually will conduce to that placidity of mind induced by the old formula, which was substantially the same as the present American A. L. A. M. formula, remains to be seen. At present, however, the French automobile journals are inclined to view it as a huge joke—one of them styles it "a catastrophe" and "a mess" almost in the same breath and further remarks that the Department of Mines must have employed a Sherlock Holmes to derive it—despite the fact that it has been aimed to account not only for stroke but for speed as well. Which means, briefly, that the French government hereafter will tax its self-propelled vehicles according to the piston displacement per minute, instead of on an empirical formula based on piston area and an arbitrary piston speed.

The new formula is empirical in a measure, of course, for it embraces different constants for two-, four- and six-cylinder motors, though just how the constant was obtained is not made plain. At any rate, it is explained that the new formula is designed to determine the minimum possible horsepower obtainable under known conditions—and it is the "fatal expression minimum" that is most held up to ridicule.

The formula itself as adopted is as follows:

$$P = KnD^2LV$$

where P = the power, K = a constant, n = the number of cylinders, D = the diameter of the pistons in centimeters, L = the stroke in centimeters and V = the number of revolutions per second. The constants adopted are as follows: 0.00017 for two-cylinder motors, 0.00015 for four-cylinder motors and 0.00013 for engines of more than four cylinders.

As an example of just how the formula works, it is interesting to note that a well-known American long-stroke motor measuring 3¼ inches bore and 5¼ inches stroke and normally rated according to the A. L. A. M. formula at 22.5 horsepower, is rated at 27.196 horsepower according to the new French formula. How far from right the rating is may be judged from the fact that at 2,200 revolutions a minute the motor in question actually develops 41 horsepower by Prony brake, while at 1,500 revolutions a minute the formula rates the motor at only 18.4 horsepower.

Three Tradesmen Cross Great Divide.

William E. Moyer, head of the Moyer Automobile Co. of Des Moines, Ia., and president of the Des Moines Auto Dealers' Association, died in Silver City, N. M., on Wednesday, 12th inst. Tuberculosis was the cause of his death. Moyer was 36 years old and a native of Iowa. He had been engaged in the automobile business for some 10 years, having first started as a Buick branch manager.

Walter W. Wallis, manager of the Milwaukee branch of the Goodyear Tire & Rubber Co., committed suicide by hanging in that city on Sunday, 9th inst. Temporary insanity is ascribed as the cause of his rash act. For several months he had complained of being troubled with frightful dreams, in some of which he saw himself hanged. Wallis was 60 years of age. He is survived by his wife and four adult children.

Sigmund Wollheim, vice-president and sales manager of the Crown Commercial Car Co. of North Milwaukee, Wis., died at his home in that city last week after a year's illness. He was 55 years of age.

White and Manhattan Renew Fight.

The filing of an order this week in the New York City Court marks the beginning of the retrial of a dispute between the White Co., of Cleveland, Ohio, and the Manhattan Top & Body Co., of New York City, which when tried the first time in that court resulted in a verdict of $990 for the Manhattan company; the suit was for the price of a body which the White company ordered but refused to accept on the grounds that it was not satisfactory. The $990 verdict was reversed by the Appellate Term of the Supreme Court for New York county and the new trial ordered.

New Men and New Money in Midland.

The Midland Motor Co., of East Moline, Ill., of which new interests recently acquired control, has increased its capital from $100,000 to $300,000. The new money, it is stated, will not be utilized for the enlargement of the plant, but for the consummation of what are referred to as "long-cherished ideas."

Kelly Truck Branch Opened in Chicago.

The Kelly-Springfield Motor Truck Co. has established a branch in Chicago at 2439 Cottage Grove avenue, of which L. D. Garrison has been appointed manager. In connection with the branch, there will be maintained a complete service department which will be open day and night.

K-D ADDS A "SIX" AND RADICALLY ALTERS DESIGN

Crescent-Shaped Valves Retained in Miss Knight's Invention, But In New Location—Some Other Features Discarded.

After more than a year spent in experimenting, the K-D Motor Co., of Boston, Mass., whose original product, Miss Margaret Knight's four-cylinder crescent valve motor, was brought out at the Boston show last year, has developed a "six" which has very little in common with its predecessor. As a matter of fact, the design as a whole differs radically from the original; it is similar to it only in that it employs the sliding crescent-shaped valves made familiar by the "four," though even the location of the valves has been altered. The bore and stroke remain the same, however—four inches and six inches, respectively.

The most conspicuous alteration in the design lies in the elimination of the Scotch yoke construction between the piston and the crankshaft and the casting out of the method of leading the exhaust gases into the crankcase for the ostensible purpose of assisting the scavenging stroke of the pistons. Neither is a feature of the new design, which, instead, is quite similar to orthodox poppet valve construction except as regards the valves, of course. Which is to say, the vertical motion of the pistons is converted into rotary motion only through the intermediary of the usual connecting rods. The use of piston rods, it is explained, limited the speed obtained to a certain extent and hence they have been discarded.

In shape, and in method of actuation, the crescent valves remain the same, movement being imparted by separate miniature crankshafts for each set, intake and exhaust, respectively; they are mounted at opposite sides of the cylinders. Instead of being fitted into pockets opening directly into the combustion chamber, however, thus necessitating that the pistons slide over them, they are outside the cylinders proper and the pistons do not come in contact with them. Full advantage of their crescent shape is taken to provide unusually large ports, which, combined with their quick opening and closing, is considered to be highly advantageous. The new "six" is to be uncovered for the first time at the Boston show next week.

Paige-Detroit Enters British Market.

The Paige-Detroit is the latest American car to enter the British market. The agency for it has been placed with the G. & W. Motor Exchange, Ltd., of London.

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WIDE-A MERCHA In the MOTOR W

BENEFITS OF QUICK SERVICE

Lack of Prompt Attention to Callers as an Effective Means of Losing Sales—One Example in Point.

The old saying, "He gives twice who gives quickly," might be properly changed for the benefit of the merchant and his salesmen to read "He serves twice who serves quickly."

If there is anything more exasperating than to have to wait five or ten minutes, or even three minutes, in a store before you are waited on or before anybody pays attention to you, it would be hard to say what it is. Buyers appreciate instant attention. The merchant who comes quickly forward to meet his trade gains inestimably. He has not only shown proper courtesy, but there is a certain amount of appreciation of intended patronage conveyed in the eager, ready attention. It never fails to win appreciation, even if it is followed by the request to "Make Yourself at home; I will be at liberty in a few minutes."

Courtesy as a First Principle.

This spontaneous courtesy is too frequently lacking in automobile establishments, and yet it is one of the first principles of inside, or "floor," salesmanship. You can go into many garages and accessory stores, "rubber around" for a few minutes, and walk out without anyone taking the trouble to inquire what you desire. One interesting and noteworthy feature of this is that the man or woman who walks out under such conditions rarely walks in again. It is a fact that most persons subjected to such lack of attention prefer to pay more money or endure inconvenience rather than submit to such treatment.

A window full of electric horns with the prices marked on attractive cards drew the attention of a Detroit motorist to such an extent that he entered the accessory store with the intention of investigating, and buying if satisfied with the tone, etc. He waited around for what seemed like five minutes, while two men of the institution talked with a third who apparently was a customer. He sounded the horns and otherwise indicated the cause of his interest, but no attention was paid other than to look up at him when he operated the instrument. As he opened the door on the way out, a man evidently the proprietor—said, "I'll be with you in a minute." But it was too late; the would-be customer did not tarry longer.

Even a compelling window display and goods of merit cannot overcome the chilling effect of such a reception. That is one reason why every dealer should emblazon on his own mind as well as on the minds of every one of his helpers the slogan, "He serves twice who serves quickly."

ABOUT CIRCULARIZING OWNERS.

The accessory dealer and jobber has a wonderful chance to get business in his locality because he can find out who are his possible customers, and this at once eliminates the element of waste that is common to most businesses.

The secretary of state will furnish complete lists of automobile owners in the state and in a great many cities lists can be secured locally. From all of which it might be inferred that direct advertising of a very profitable sort could and would be done. Of course, everyone knows that this is the case; but it is equally certain that, like a great many things everyone knows, only a few avail themselves of the opportunity.

Once a year everybody gets a notion to send something to every owner in a given locality, and it is all done about the same time, with the result that for a week or ten days after his car has been registered or possibly after the first fine spring day the owner is deluged with circulars. The rest of the time he gets an occasional flash that finds its way into the waste basket—unread and therefore unheeded.

Within the past three years, drawing from personal experience, there cannot be recalled any single direct-by-mail campaign that stands out from the others. Nor does there remain recollection of any definite proposition by mail that offered to furnish a certain thing at a certain time for a certain price. Hundreds of general publicity folders that told things already known were received, but none were far enough above the average to leave the slightest impression.

Automobile dealers and accessory dealers will find it profitable to pick out one or two things and make a complete proposition, including prices and offers of immediate delivery at the home or office of the prospect. In other words, make a situation that calls for action of some kind. Don't content yourself with general talk about quality and best prices. Say something!

LIGHTING DISPLAY WINDOWS.

Some window displays are completely killed because of heavy shadows. You go by the store and are conscious that there are display windows, but the shadows are so deep that you do not get a glimpse of what is inside. This is a condition that should be remedied even if it is necessary to use artificial light to attract attention. Study the situation, see what can be done by means of mirrors, reflectors, etc. But do not pay for window space and then not get the value of it.

One of the most interesting facts in connection with selling cars or anything else is that the human equation is always human. It's never the same, but there is always a way to a heart or a head if we will only steer for the right channel.

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AWAKE-N DISING WORLD

"NOTHING DOING" DISPROVED

Incident that Serves to Show How Sales Ripen Unknowingly—Also Illustrating Folly of Not Following Up Closely.

"Things certainly are quiet," remarked a salesman for a certain automobile concern as he dropped into the office of the manager. "There is absolutely nothing doing. I've made seven calls to-day and haven't got even a nibble. I don't believe any one wants to buy cars now; everyone seems to want to wait till spring."

"What about that Mr. Dean? Have you called on him this week?" asked the manager.

"Oh, I dropped in to see him about two weeks ago; I don't think he is ready yet," replied the salesman.

"Well, I have an idea that it's about time to try and close with Dean, and I want you to call on him this afternoon. If he is not in this afternoon, get busy on him the first thing in the morning. And there's Mr. Rogers—what about him?" queried the manager.

"To tell the truth, I had forgotten all about Rogers," explained the salesman.

It was about 2:30 in the afternoon when this dialogue took place. At five o'clock the salesman called up the manager and reported that he had secured Dean's signed order for immediate delivery.

The manager knew no more about Dean's being ready to close than the salesman, but when he heard the salesman talk about the quietness of things he began to recall prospects that a month ago seemed live ones; Dean was the first that came to mind.

The trouble with the salesman was that he was trying to make too many calls, and as a result was not following up closely work already started. If he had been asked to name ten of the livest prospects he had he could not have done it. Can you? If you can, then the suggestion is that you get busy on that ten and turn some of them into sales. After you have their cases thoroughly settled, tackle ten more. You will find the plan works.

"Knowing a buyer well, is a very fine asset, that is, if you sell the goods to him at a profit; but a salesman can reach a position where everyone is so friendly that he sells his goods at a loss."

AN OPPORTUNITY THAT YAWNS FOR A WIDE-AWAKE DEALER.

Some dealer in high-priced cars such as are uniformly driven by hired chauffeurs would make a great hit with his customers if he would draw up and supply his customers with a form for hiring a chauffeur.

Such a form would indicate the responsibilities, duties and privileges of a chauffeur in clear, definite language. It would cover every situation as far as possible and should be made from a thorough knowledge and understanding of the whimsicalities of that recently developed profession.

Imagine a customer's pleasure at having a printed blank sent him covering all the details more concisely, more thoroughly than he could possibly sum them up. Such service is one of the many which shrewd, wide-awake dealers will be prepared to offer customers.

The need is real. Will someone rise to the opportunity?

LOCKERS FOR GARAGE CUSTOMERS.

Simply as an experiment, an Ohio garage, which had gone through the usual experience of having many little things disappear from cars, the fate of which remained a mystery, decided to make an investment in metal lockers, and rent them to customers.

The initial order was for five lockers and the garage housed some 30-odd cars. An extra charge of one dollar a month was made for the lockers. The five lockers were all rented as soon as they were set up, and before nightfall the next day an order was on the way to the factory for ten more.

Where prices run about the same for the same average service there is always one or two things that keep one garage filled all the time, while another has space to rent. Frequently the difference lies in little points of convenience like the one indicated.

In nearly every city there are motorists still waiting for the garage with the clean toilet room with clean towels, clean washbasin and other decent necessities. Certainly it costs something to provide these conveniences, but when you consider the class of trade you are dealing with it is reasonable to expect that your investment will ultimately yield a profit.

Right here it is pertinent to remark that the filthy, unsanitary conditions that obtain in too many garage toilet rooms are an insult to customers and a disgrace to the proprietors.

IS YOUR KNOWLEDGE ORGANIZED?

Herbert Spencer declares that science is organized knowledge. The demand to-day is for scientific business methods. Is your knowledge of your business organized? Have you got all the facts concerning it classified? Can you put your fingers on the weak spots? Can you point to the remedy? Have you all the facts at your fingers' ends?

Every good business man knows exactly what his bank balance is every day. Is your business organized so that the facts concerning it are available in the same way, or is everything in a heap? You feel sure it is all there, somewhere in that pile—maybe underneath, perhaps in the middle—but not where you can go right to it and get it. If that is the condition, the thing to do is to sort out the pile at once and get the information in orderly arrangement.

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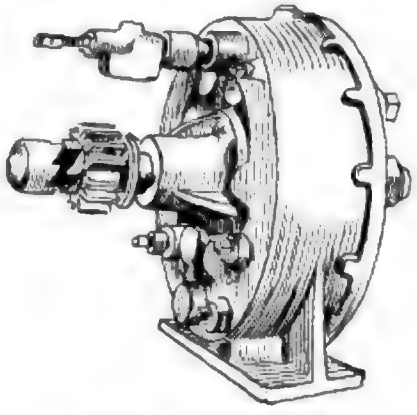
TOY ENGINE PRINCIPLE IN ROTARY AIR STARTER

Merrall Device Comprises Six Cylinders of Oscillating Type—Dead Centers Eliminated by Positioning of Ports.

Although with a six-cylinder motor it is practically impossible to stop with the crankshaft in such position as to render ineffective an air starter of the usual type, with the air admitted directly to the cylinders through the intermediary of a distributer valve, with the four-cylinder motor such is not the case. Which, according to W. A. Merrall, of 617 Lexington avenue, New York City, who is the patentee of the Merrall rotary air starter, for the purpose of marketing which a $150,000 corporation now is in the course of organization, under New York laws, opens the field for an air starter of the type wherein the power to crank the motor is obtained from a separate air motor.

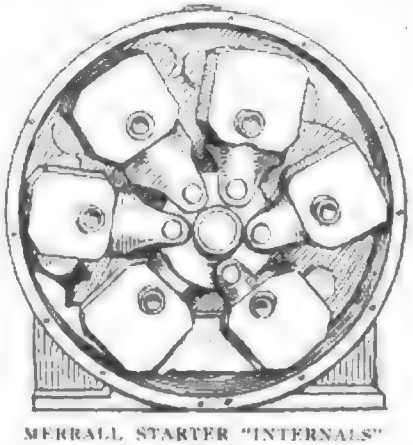
The Merrall device is so simple as to be comprehensible by any school boy who has ever possessed a toy steam engine, for it is in fact but little more. As shown by the accompanying illustrations, the device comprises six cylinders provided with pistons of the trunk type, all of which act upon a common crank pin. Each of the pistons is pivoted to the rear wall of the enclosing case, so that it is free to oscillate as the motor shaft is turned. A single port enters near the closed end of each cylinder and two ports, one for the exhaust and one for the induction, are provided to register with the cylinder ports in the rear wall of the casing. Just as the crankshaft tosses the dead center with relation to any one of the cylinders, the port in that cylinder is brought into line with the corresponding inlet port provided in the casing wall and air under pressure is admitted, to the end that the piston is set in motion and the shaft caused to revolve. When the piston has reached the half-way point in its stroke the cylinder port has moved out of line with the inlet port and the expansive power of the compressed air is utilized to drive the piston to the end of its stroke, at which time the relative position of the cylinder and casing wall is such that the exhaust port is uncovered and remains uncovered until the piston has reached the top of its stroke. Since six cylinders are provided, it is obvious that in any position of the motor shaft at least two of the cylinders must be on the working stroke and starting must be the inevitable result of opening the throttle valve.

Naturally, the Merrall starter, like the electric starter, can be attached to the motor mechanism at any convenient point, such as the magneto or pump shaft or through teeth provided on the periphery of the flywheel; a dog clutch is provided for throwing the device out of engagement when the motor has taken up its cycle of operation. The starter is supplied either with or without a



MERRALL AIR STARTER

compressor. Where a compressor is supplied, it is cast integral with the motor case and comprises a pair of opposed cylinders provided with suitable pistons and clack valves of the orthodox type; without the compressor the device must needs be run on the spent gases from the motor stored in a suitable tank. The device, it is claimed, will start the motor 20 times on 30 pounds air pressure; on 100 pounds



MERRALL STARTER "INTERNALS"

pressure it will develop 3½ horsepower. Complete with a pressed steel tank measuring seven inches in diameter and four feet in length, the device weighs but 40 pounds and will sell at a price in the neighborhood of $150.

Getting Home With Punctured Float.

When a carburetter float fails and a new one is not procurable, "getting home" is a matter of using one's wits. Generally it can be accomplished by cutting down the supply from the tank so as to correspond with the flow through the needle valve.

IMPROVISED FAN BELTING THAT SAVED A SITUATION

Heavy Load and Stalled Fan Cause Overheated Truck Motor—How the Chauffeur Effected an Ingenious Repair.

On the greater number of cars, a stalled fan in warm or even moderate weather means a stalled motor sooner or later, unless the fault is corrected. Of course, the only way to correct the fault is to replace the belt and, in nine cases out of ten, it is merely a matter of replacing a fastener which has pulled out. Once in a while, however, one of those "freak" accidents will happen and the belt will become twisted around the pulley or entangled with the magneto drive shaft or the pump drive shaft and be torn to shreds. "Get a new belt" is the advice forthcoming from anyone who has to do with motor cars, but if conditions are such that for the time being a new belt is not procurable and the motor absolutely refuses to function properly with the fan at a standstill, the case assumes a more or less serious aspect.

One driver who faced the situation—he was a driver of a motor truck and had the vehicle loaded to the limit at the time—proved equal to the emergency. His tool box offered nothing more promising as a belt substitute than a coil of No. 18 cotton covered copper wire—bell wire, as it is called, for it generally is used in connection with door bell installation. From this, the paraffined insulation was removed by burning; it simply was necessary to ignite the covering, which burns freely, and the process served to anneal the wire also and render it pliable. The covering removed and the wire cooled down sufficiently to be handled, the wire was folded so as to form a multi-strand strip very nearly as long as the belt. The ends were bound with short pieces of wire and a short, stiff helical spring of small diameter was firmly wired between them. The belt then was placed in position and the belt tensioning adjustment shifted until the spring was stretched sufficiently to cause the belt to grip the pulleys. Needless to state, the improvision answered the purpose for a time sufficient for the delivery of the load and for the driver to obtain a new belt, otherwise the tale would not have been worth the telling.

Sand as a Traction Agent.

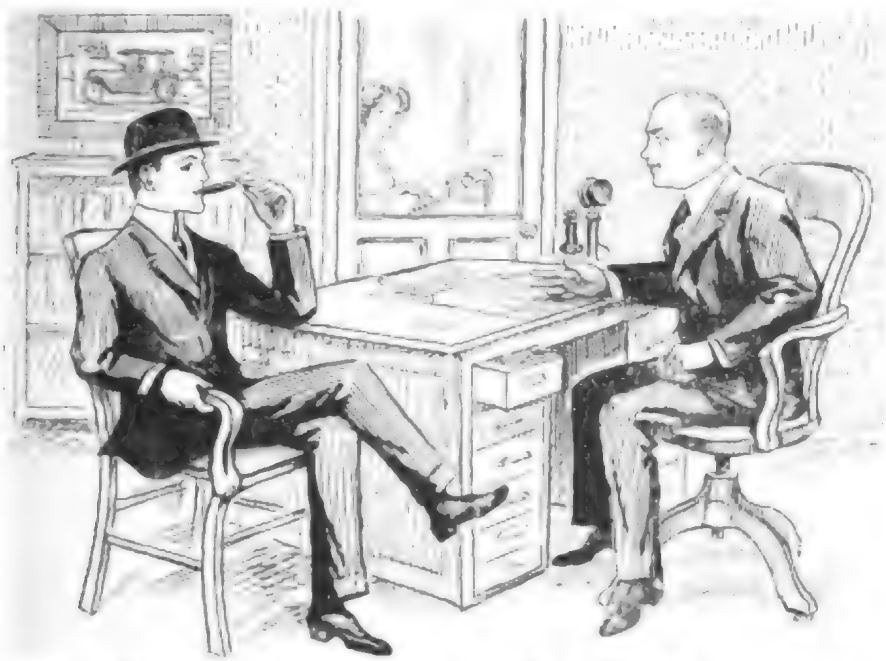
When the driving wheels get into mud so deep and so slippery that traction cannot be maintained, it is a good plan to throw dust, sand or straw into the mud to thicken it and partly lessen its "lubricating" qualities.

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REILLY ON MEN WHO DO NOT LIKE THEIR WORK

Advises One of Them to Quit His Job and Cease Misdirecting His Energies—Declares Relish for Duty is One of the First Essentials of Success in Business and Cites Several Failures.

From the office of the News there emerged a young man who, after reaching the sidewalk, looked perplexedly up the street and then cast just as perplexed a look down the street; but he didn't hesitate long—for two reasons. One reason was that he was not of the hesitating kind, the other was that he didn't have much time in which to hesitate.



"HIS TROUBL.. WAS HE WASN'T CUT OUT FOR A DEALER," SAID REILLY

After the termination of this brief period of hesitancy, the young man walked with decided step to the next corner, climbed aboard a street car when one came and rode to Automobile Row, where he alighted, walked to Reilly's salesrooms, entered the office, which was empty, helped himself to a cigar from a desk drawer, lighted the smoke and sat down contentedly with the remark, "Well, the old shiny-pate can't be far away, his overcoat's here."

At first he had not noticed the office girl in her little adjoining compartment, and when he did see her she was looking through the glass partition at him with an amused smile; the young man arose, went to her door and said, "How do you do? Is Mr. Reilly about?"

"Yes," she replied, "he's out in the shop. He'll be right in shortly. Make yourself at home."

"Oh, I did that some time ago," laughed the youth; "what you mean is, 'Keep on making yourself at home.'"

Reilly interrupted the dialogue by entering at this moment.

"Hello, Charley, what's the matter today?" he exclaimed. "How long have you been here and how many of those cigars have you smoked?"

"The matter is," replied the man who answered to the name of Charley, "that I've got orders from the boss to get a special article every week for the automobile section on something of interest to owners, and I've got to have some dealer's name signed to it. As to the rest of the question, I've been here about ten minutes and am on my first cigar."

"Well," asserted Reilly, "I suppose I'm to be the goat the first time; you're going to smoke up a few of my cigars and jolly the office girl and go back and write something and sign my name to it. Am I right?"

"Something like that," admitted the youth.

"Very kind of you to give me warning," said the dealer.

"Maybe you'd like to write it yourself? I'm perfectly willing," declared the newspaper man. "But, of course, I know you won't do it; that's too much like real work."

"Say!" exclaimed the interviewer, "how'd you ever happen to get into this business when you're such a good publicity man?"

"I like it and it makes money for me," was the response.

"Reason enough," remarked Charley; "but that's where we differ—I don't like my work and it isn't making me any money."

"Then get into something that you do like and maybe it will make you money," directed the dealer.

Round Pegs in Square Holes.

"I've often wondered," continued Reilly, "why more men don't get into something where their energy and will count for more than it does. And I've also pondered much as to the reason so many people stay in positions or businesses that are not fitted for them and who plug along at work which is only a treadmill to them, which they detest from the bottom of their hearts and in which they never can make their greatest success."

"Do you mean I ought to jump the job?" asked the young man.

"Oh, I don't advise you to go back and quit this afternoon," explained Reilly, "but why don't you get into a line of work that you are fitted for, because as long as you were not cut out for newspaper work you are not likely to progress very swiftly. Here you are, working like a nailer six days in the week, and if I am any judge you can work right on until they put you on the shelf and you'll never get very high, not unless they put you on a high shelf. You know that you aren't the kind of a man to get on over fast in this business, so why stay there? Why don't you get into some line of work where the talents you possess will find opportunity to prove their value?"

"For instance?" asked the object of the lecture.

Finding One's Proper Forte.

"That's for you to find out," stated the dealer. "You ought to be able to land something that you like and are fitted for and which will enable you to apply your energies to the best advantage. But if you do change, don't do what so many men do; don't get where you don't belong and, if

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you do, don't stay there. You probably have seen several men come into this trade and pass out again within a few years and have wondered what there was the matter with the automobile business that they didn't make good. But did you ever know these men and try to learn whether it was the business or the men that were at fault?

Reilly's Investigation of a Failure.

"If you haven't, I have. When I was new in the business and heard of men giving up their dealerships because they weren't making anything it naturally caused me to think a bit, for I didn't want to tie myself to a business that contained no future. I remember about the third or fourth man who quit after I started was a fellow by the name of Burns. I made up my mind to investigate a little. I called on Burns, ostensibly to ask him if he was going to dispose of anything I needed, and I got him to tell me about his troubles. Also, I later learned a few things from people who knew him.

"His whole trouble was that he wasn't cut out for a dealer; that's why he failed. He used to be a druggist, and was a good druggist, too, but he saw a competitor open up near him and just about that time there was a chance at the automobile dealership, so Burns took it—to his sorrow. He opened up a little showroom with a repair shop at the rear, and if he had been the right kind of man could have made more or less of a success of it. But he didn't work in the right direction."

"What did he do?" asked the man who at times was known by the dignified title of Automobile Editor.

Dealer's Energy Was Misdirected.

"For one thing," continued Reilly, "he thought he ought to put his whole self into the business, just as he had done in the drug store; so he went out into the shop and puttered around cars, got all dirty, and anyone who came in couldn't tell him from a workman. His energy should have been directed toward the building up of a sales department, getting prospects for sales and working that end of the business, but all the time he was complaining that there was so much work around the place that he never could get time to go out to sell cars. The poor cuss! If he had got into a demonstrating car and worked as hard about town as he did around the back end of the shop, he would have had money to-day. I know that one day he actually neglected a sale, and in the end lost it, because he wouldn't break away from the darned detail about the office. What really was the trouble was that he was not fitted for the busy outside work that automobile selling requires. He could take care of the drug store, where trade came to him, but he couldn't get out and fight for it.

"He's but one. There are any number of men to-day who are shouting that the garage business doesn't pay. That general fact is all that they know about it, and that is based upon the fact that they don't seem to be making money. Why they lose or where they lose is beyond them. Those men never were cut out to run garages. There is hope for them if they turn over a new leaf, but the majority of them will quit the business with a firm belief that there is no money in it.

"Bill" and the Revolving Doors.

"They're like Billy Sommers, who lives outside the city where I lived when I was a kid. Billy, I don't believe, will ever go to Congress. One day he came to town with his dad and dad let Billy go out alone, but told him to come back in an hour to the little old hotel where the farmers put up. Billy came back all right and started to come in, but the hotel had a set of these revolving doors and Billy, of course, never having gone at anything in the right way from the day he was born, tried to turn the doors the wrong way. They stuck, of course, and poor Billy pushed and jammed for ten or fifteen minutes. Some of the men tried to push the door the right way, but Billy thought they were trying to keep him out and he got mad and pushed all the harder. They had to let him have his way. He got through, but it was a fearful example of misdirection of energy."

"Do you mean to compare me to old Bill Sommers?" asked the newspaperman indignantly.

"I didn't mean to, but maybe you are like him," said Reilly, as he critically surveyed his caller, slowly looking him over from head to feet and back again.

Real Workers and Time-Servers.

"Did you ever stop to think, friend Charles," earnestly went on the dealer, "that your object in life, unless I'm mistaken, is to make money enough to live comfortably and to take care of yourself when you get to the point where you don't want to work any more and that, unless you're below the average, you ought to be able to do it? You have a certain amount of energy which ought to enable you to get what you want, or all you need, at least; now, you undoubtedly feel that you are working at your very best in your present position, and yet you know that you don't get on very swiftly. Doesn't that make you feel like pushing a revolving door the wrong way and that there must be some easier way if only you can find it? No matter who a man is, he ought to apply his energy where it will benefit him most, and if he doesn't like his work he simply can't do it, no matter how hard he tries.

"No man who does not relish his work and take pride in it ever will be able to make a distinct success or become much more than a mere time-server. Time-serving is one of the chief troubles of industrial life.

Abraham Lincoln as an Example.

"One of the greatest men that ever lived would never have been heard of had he not realized that he was misdirecting his energy. That was Lincoln, whose birthday just passed. Lincoln was engaged in various things at different times, and at one time, with a partner, ran a store. But Lincoln didn't have much more talent for merchandizing than a two-year-old kid. The partner, too, was too deeply interested in the liquor which in those days was part of the stock of the general store, and it wasn't long before they gave it up. Lincoln might have kept at the store business all his life, and he probably would be resting now under a cheap slab in a forgotten country graveyard.

"But he thought he saw his future in law and to law he turned, and I don't need to tell you any more about it; but—it doesn't mean that Lincoln did not work as hard at law as he did in the store. It means that he worked where his efforts counted for something; he was in work for which he was naturally fitted and which he relished."

"Maybe I am in the Bill Sommers class," interrupted the automobile writer, "but if I'm to get an interview out of you to-day it looks to me like misdirected energy for you to chatter about something foreign to the subject and for me to listen to you."

"You wanted me to talk, didn't you?"

"Talk!" exclaimed Charley. "It's no trouble to get you to talk; the only trouble is to steer you into what I want you to talk about."

"Well," asked Reilly, "what do you want me to talk about?"

"Oh," slowly rejoined the newspaperman as he arose and buttoned his overcoat and picked another cigar out of the desk drawer, "I'll think up what you're going to say on my way back to the office."

Offers Inducements for Farm Tractors.

By way of stimulating the exhibition of agricultural tractors at the St. Petersburg automobile show, which is scheduled to be held in May, the committee in charge of exhibits has reversed the usual proceeding and offered a premium of 1,000 francs (about $200) for every agricultural tractor installation (tractor and plough, or other agricultural machinery) exhibited. The premium is offered partially to offset the expense of transporting such machinery.

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GOULD'S COUNTRY ESTATE SUGGESTED BY NEWARK SHOW

Vine-grown Pergolas Patterned After Multi-millionaire's Possession—Fifty-nine Dealers Show Sixty-nine Care.

George Gould's estate at Lakewood supplied the decorative theme for the Newark automobile show—the sixth under the auspices of the New Jersey Automobile Exhibition Co.—which "opened up" in the First Regiment Armory on Saturday evening last, 15th inst. The vine-grown pergolas which span the three aisles which run the length of the immense room are patterned after the Gould pergola at Lakewood; hence the likeness. Of course, a patch of blue sky has been added by way of making the country estate setting realistic, while a degree of warmth is provided by the cardinal and white draperies which bedeck the galleries and which radiate fan-like from points on the two end walls. The long hall leading to the drill room is lined with marble columns supporting luminous globes which form part of the lighting scheme, and wistaria vines in full bloom festoon between the columns.



GENERAL VIEW OF THE NEWARK (N. J.) SHOW IN THE FIRST REGIMENT ARMORY

The product of some 69 different motor car factories are on view, shown by 59 dealers; in the matter of accessories, the manufacturers of the smaller devices and parts are well represented by 28 accessory dealers.

Although in the line of pleasure cars nothing that was not shown at the New York show cropped out, such was not the case with the commercial vehicle field, for a slight amount of newness appeared in the shape of the A. & R. truck, made by the Abendroth & Root Mfg. Co., of Newburgh, N. Y. The vehicle is of conventional design and is fitted with a four-cylinder cast-in-pairs motor disposed under the driver's seat. Water cooling is adhered to, and the bore and stroke stand at 5 and 5¼ inches, respectively; transmission of power to the rear wheels is through the orthodox clutch and three-speed gearset to the counter shaft and thence through roller chains to the rear wheels. The truck is built in three sizes for carrying three, four and five tons, respectively.

Also new, in the sense that it has not heretofore been exhibited, is the Maxi carburetter, product of the Maxi Co. of Newark. The device, which has been fully described by Motor World, lays its claim to individuality by reason of the fact that the 14 fuel jets or orifices with which it is graced are uncovered one at a time and consequently brought into action by the opening of the throttle valve itself, so that constancy of mixture proportions is very closely approximated under all conditions of motor operation. The low speed jet protrudes through the butterfly valve into the mixing chamber so that the suction of the motor draws forth a heavy supply of fuel, rendered starting a comparatively simple matter.

The pleasure cars on view are: Abbott-Detroit, American, Auburn, Buick, Cadillac, Case, Chalmers, Chevrolet, Cole, Cutting, Flanders, Franklin, Garford, Haynes, Henderson, Hudson, Hupmobile, Kline, Little, Lozier, Locomobile, Marmon, Marion, Michigan, Moline, National, Norwalk, Nyberg, Oakland, Oldsmobile, Packard, Pathfinder, Peerless, Pierce-Arrow, Premier, Pullman, Rauch & Lang, Regal, Reo, S. G. V., Simplex, Standard electric, Stearns-Knight, Stevens-Duryea, Studebaker, Stutz, Velie, Winton.

Commercial vehicles: Adams, A. & R., Buick, Chase, Croce, Garford, Hewitt, I. H. C., Koehler, Lansden electric, Locomobile, Mack, Nonpareil, Nyberg, Packard, Peerless, Pierce-Arrow, Saurer, Stewart, Universal, Velie.

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KANSAS CITY, AS USUAL, STAGES A "BUMPER" SHOW

So Large That Trucks Will Overflow Into Second Week—English Setting Provided for the American Automobiles.

Convention Hall, or, better, the Kansas City Convention Hall, for buildings of that designation are legion, which not long since was considered sufficiently large properly to house the full complement of pleasure and commercial vehicles which comprise the annual show of the Kansas City Motor Car Dealers' Association, this year has been found to be inadequate. In consequence, the exhibition which opened on Monday evening last, February 17th, and which will continue for two weeks until Saturday evening, March 1st, will be split into two parts. Part I, comprising pleasure cars, will hold forth throughout the present week only, to be replaced by commercial vehicles after next Saturday night.

In the matter of decorations, no expense has been spared in an endeavor to render the building eye-pleasing, with the result that the 63 different makes of automobiles now on display, shown by 46 dealers, are viewed 'mid scenes typical of "merrie England." The "fixings" and the scenic panels which line the walls all convey the impression of an English country estate. An unusually wide concourse has been laid out down the center of the hall, and over this stretches a vine-grown pergola. Illumination is supplied by seven massive globes, each containing a large number of tungsten lamps, which are hung from the roof girders, themselves invisible because of the improvised blue sky which is provided.

Two makes of cars cropped out which have not been previously exhibited during the present show season, in the shape of the Stafford, product of the Stafford Motor Car Co., a local concern, and the Wilcox, which is made in Minneapolis by the Wilcox Motor Car Co. Both are four-cylinder machines, built along conventional lines.

The cars on view are: Auburn, Apperson, Abbott, American, Bergdoll, Buick, Cartercar, Chalmers, Case, Cutting, Cadillac, Chevrolet, Dorris, Detroiter, Empire, Flanders, Franklin, Garford, Hupmobile, Hudson, Imperial, Interstate, Jackson, Krit, King, Kissel, Lozier, Little, Mercer, Mitchell, Marmon, Maxwell, Moline, Oakland, Overland, Oldsmobile, Premier, Paige, Pierce-Arrow, Peerless, Packard, Regal, Rambler, R. C. H., Reo, Stearns, Speedwell, Stutz, Stevens-Duryea, Stafford, Studebaker, Velie, Warren, White, Wilcox, Baker electric, Detroit electric, Hupp-Yeats electric Ohio electric, Rauch & Lang electric, Waverly electric, Woods electric, Stanley.

Richmond Offers First Show to F. F. V.'s.

Richmond, Va., has inaugurated its first automobile show. It opened, under the management of the Richmond Automobile Dealers' Association, on Monday evening last, February 17th, in the Horse Show building, which naturally has been fittingly bedecked with smilax-entwined cedar trees and vari-colored streamers and bunting strips and myriad incandescent lights disposed in the foliage. Japanese umbrellas, many in number and varying in size, add to the attractiveness of the decorations. The show, which comprises 28 different makes of vehicles, both pleasure and commercial, shown by 18 dealers, and the displays of half a dozen accessory dealers, will be in progress throughout this week.

The vehicles on view are: Krit, Cadillac, Kline, Buick, Pierce-Arrow, Peerless, Hupmobile, Studebaker, Alco, Stevens-Duryea, Abbott-Detroit, Maxwell, Overland, Ford, 1-H-C commercial, Knox, Hupp-Yeats electric, R. C. H., Mitchell, Locomobile, National, Little Giant commercial, Chalmers, Warren, Case, Standard, Kelly truck.

Lambert Apparently Emulates Lightning.

If reliance can be placed on press cables, a new one-hour speedway record of 103¾ miles was made by Percy Lambert on the Brooklands track to February 15th. His intermediate times were 29:00.4 for 50 miles and 57:49.6 for the century. The American record for an hour's run on a speedway is held by Ray Harroun, who covered 74 miles in the time at Los Angeles, in April, 1910. Lambert's time for a single mile figures at 34.7 seconds, .65 faster than Robert Burman, the American record holder for a single mile on a speedway, which he was able to do on the Indianapolis track in 1911. If the time accredited to Lambert is correct, his performance was phenomenal—even more so if it is true, as the cables report, that he drove a car of only 25 horsepower.

Declares "Trolley Stop" Unconstitutional.

Hereafter the drivers of automobiles in Columbus, Ohio, need not bring their cars to a full stop when passing trolley cars receiving or discharging passengers, for, as a result of a test case instituted by the Columbus Automobile Club, the recently enacted ordinance making such stops compulsory has been declared unconstitutional. Decision was rendered on the argument that persons entering or leaving a car are not really passengers until fully on the car and that the wording of the measure therefore is ambiguous. It was also contended that the law operated to cause traffic congestion at crossings. No appeal will be taken.

BILL PICKENS LEASES THE BRIGHTON BEACH TRACK

And If Nothing Happens, Maybe He'll Hold a Good Humored Outlaw Racemeet On It—Diagram That Is Lacking.

After having spent some time promoting "bird men" who did not fly across the continent, Bill Pickens is again in New York. He brought with him that wealth of good nature and fund of good stories, not to mention the abundant "nerve" of which he admits ownership, and, possessed of them, he has leased the Brighton Beach track for May 30th and 31st, and on those days, if everything is lovely and the goose hangs low, William will stage a race meet on that Brooklyn (N. Y.) course.

Pickens himself has been "in bad" with the American Automobile Association ever since he directed or followed the flip-flops of Barney Oldfield, and as a result he is a more or less earnest and enthusiastic supporter of the so-called Western Automobile Association, which consists chiefly of a half-hundred Los Angeles motorists who do not believe that the A. A. A. should apply to Californians the same rules which apply to other residents of the United States. The W. A. A. will "sanction" Bill's meet.

The good-natured Pickens has caused to circulate a story that he has behind him a Californian named Hewlett, who is reported to possess uncounted millions and who is reputed to be the "chiefest outlaw of them all." Bill, however, has not submitted a diagram showing just how far behind him Hewlett may be, but regardless of that circumstance, it is known that Pickens really has the moral and other support of a New York theatrical press agent named Dan Smith, who is close to the owner of the Brighton Beach track.

Smith's good offices and glorious picture painting are understood to have induced the Brighton Beach track owners to see large dollar signs arising from an outlaw meet in which Barney Oldfield and Teddy Tetzlaff will perform the chief gyrations. The dollar signs were made to look so large that the track owners are said not to care more than a fig and a half whether their property is outlawed by the A. A. A. after May 30th.

However that may be, very many things are likely to happen between February 28th and May 30th, but whatever happens, it is fairly certain that Pickens will retain his good nature and continue to be a more or less practical joker. It is one of his superb accomplishments that he is able to make many people take him more seriously than he takes himself or desires to be taken.

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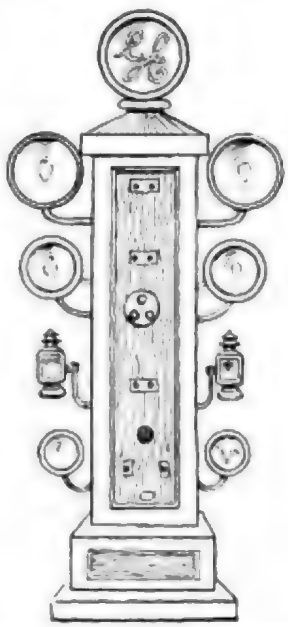
THE VALUE OF FIXTURES AS "SILENT SALESMEN"

Illuminating Methods of Displaying Illuminating Apparatus in a Manner to Make Plain Individual Qualities—Some Simple and Some Ornate Devices That Have Been Evolved to Permit of Displays of Lamps.

"Let your light so shine," runs the Biblical saying; and an evening stroll through the automobile sections of Broadway, or, for that matter, any other thoroughfare well lined with automobile accessory stores, is likely to result in the conviction that at least a few of the accessory men have taken the saying in a literal sense; they have realized the value of it commercially and as a result have brought storage batteries into use, and electric headlights all aglow are no longer infrequent sights in show windows. But in order to display a lamp or a set of lamps attractively, something more is necessary than the mere fact that they are burning. It is just as important that they should be appropriately mounted, and in the devising of the fixtures upon which the "shining lights" are displayed no little ingenuity has been brought into play.

Attractive by Night and by Day.

Lamps must be displayed in the daytime as well as at night, and consequently the fixtures upon which they are mounted must be of such character that they will do duty as well when the sun shines as when it does not. As Motor World has iterated and reiterated, the art of selling things consists largely in showing them in a favorable light—showing them to the best advantage—and appropriate fixtures go a long way toward accomplishing this end, particularly in the case of lamps, which lose their attractiveness to a great extent when tilted over on a shelf or a counter. At the same time, it is quite as important to remember



GENERAL ELECTRIC DEMONSTRATOR

that it is not the fixture that is on exhibition, and to subordinate it to the goods it is to hold up for inspection and, perhaps, admiration.

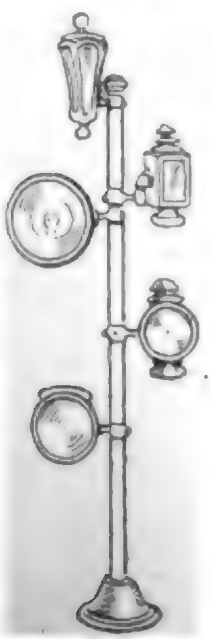
Stands for Showing Shining Lights.

It goes without saying that the vast improvements made in electric lighting systems within the last few years have opened the way for displays of illuminating apparatus that were out of the question previously. The national automobile shows were fairly alive with concrete examples—electric lighting systems shown in full operation, dynamos buzzing, and lamps sending their blue-white "pencils" through the dusty, smoky air. Clearly, many of the display methods employed at the shows can be just as well made use of in window or store displays, though some, of course, are suitable more particularly for exhibition work in the hands of operators who explain things even while they are happening.

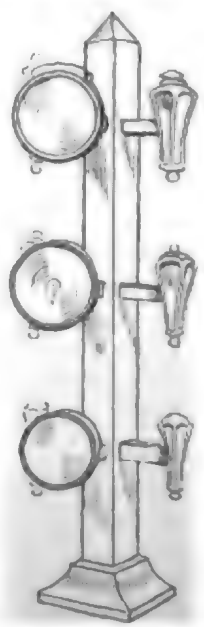
Fixtures for the display of lamps vary in their characteristics quite as much as other fixtures, ranging all the way from extremely elaborate and decidedly expensive affairs of more or less permanent character to simple stands or racks for holding lamps before the eye in their proper positions and on their own brackets. Even the simplest of these devices—and some of them are about as far removed from complexity as it is possible for fixtures to be removed—can be made, and are made, to answer their ends with satisfaction to seller and buyer. Lamps, as a rule, are awkward things to handle, look clumsy and unattractive when held in the hands, and so require fixtures for their adequate display—in which they differ from some accessories that can be shown quite effectively with little or no apparatus.

An Elaborate Pillar of Electric Light.

At once elaborate, practical and effective, a lamp-displaying fixture that is used by the General Electric company provides means not only for showing how the lamps look when they are hung, but also provides connections for supplying electricity to the bulbs and switches for turning on and off the current. A heavy square pillar mounted on a substantial base carries four brackets on each side, the eight brackets supporting four pairs of lamps of different styles,



SIMPLEST TYPE OF FIXTURE



ADLAKE DISPLAY STANDARD

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while the pillar is surmounted by a single great headlight, the lens of which bears the letters "G. E." The top brackets carry a pair of headlights which, though large, are smaller than the big "masthead light"; on the second pair of brackets is a pair of smaller lamps, and so on, tapering down to a pair of small side lamps at the bottom. On a polished wood panel extending nearly the full length of the column are the switches for controlling the current supply to the various lamps. Not a small part of the usefulness of this fixture consists in the fact that the lamps can be changed as often as may be desired and the possibility of monotony eliminated—a fact which, however, applies equally to other and less elaborate fixtures.

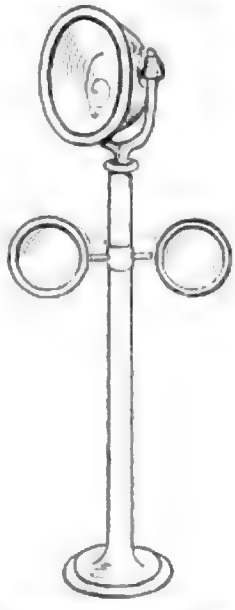
How Lamps Look on the Car.

Not only to show their lamps to good advantage, but to show them practically as they appear when mounted on a car, is the object of a fixture employed by Gray & Davis. The stand does not simulate the front of a car further than that it provides mountings which bring a pair of headlights and a pair of side lamps into correct relative positions. When the lamps are burning, however, the effectiveness of the arrangement is instantly evident; in the radiance of the lights it is easy to imagine the stand an automobile, and the lamps look entirely "at home" and in their right places.

Effectiveness in no small degree is combined with simplicity in a fixture upon which Solar lamps are shown. As in the Gray & Davis stand, there is no studied effort to make an imitation of a car front; yet, when the bulbs are glowing it requires but little imagination to see exactly the effect of a big central headlight above a pair of smaller headlights—an arrangement that is not uncommonly employed for night driving under conditions requiring an unusual abundance of illumination. As the illustration clearly indicates, the big central lamp is mounted on a bracket that swivels in a socket on the top of the heavy metal standard, while the pair of smaller illuminators is carried by a double-armed bracket, the arms springing from a tubular clamp which encircles the column. Obviously, there is no particular reason why other pairs of lamps cannot be mounted on the same standard, though the illustration shows only one pair.

Variations on Column "Motif."

The popular column "motif" lends itself extremely well to the display of a number of varieties of lamps and has the advantage of occupying comparatively little space and of being as unobtrusive as it is useful. The "general utility" lamp column shown in one of the accompanying illustrations is fitted with a number of brackets clamped on by means of split sleeves and pinching screws. These brackets, and of course the lamps they support, can be placed at any desired height on the column and swung all round the circle; there are all sorts of opportunities for making varied and effective combinations, especially if two such col-

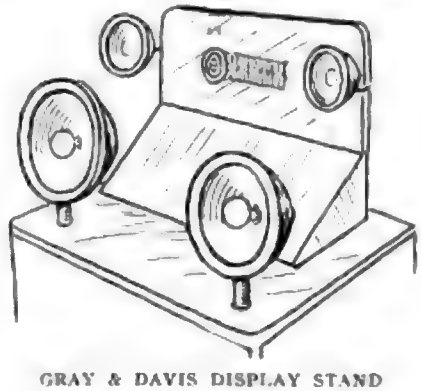


SOLAR DOUBLE-PURPOSE BRACKET

umns are placed close enough together to obtain an "ensemble" effect, with both headlights and side lamps mounted.

A Colonial Type of Fixture.

A type of fixture that is particularly well suited to the display of lamps of the so-called "Colonial" and other quaint types, is the square-column stand used to hold up to view some of the goods of the Adams &



GRAY & DAVIS DISPLAY STAND

Westlake company. Not only is this stand particularly appropriate for exhibiting Colonial lamps, but it is of a design that harmonizes well with the interior finish of many modern salesrooms in which the woodwork is of mission or other plain, heavy finish. The severely plain post with its pyramidal peak and short wooden arms upon which the lamps are hung, is attractive by reason of its very lack of ornateness. Obviously such a fixture is not so "versatile," so to speak, as the metal columns with their adjustable lamps and brackets; but it is designed for a special purpose, and the illustration shows how accurately it fits into its niche.

Variety of the Spice of Display.

A variation of the predominant vertical column idea consists in a horizontal rail carried between two standards, and having clamps and brackets similar to those on the upright stands; there also are stands having two or more horizontal rails, so that a large number of lamps can be displayed in a small space.

Nearly all of the stands referred to permit the frequent changes and the wide variety of exhibits demanded by modern selling methods, which insist that the passer-by shall not refrain from taking a look because he knows in advance what he will see. And while the fixtures are attractive and sightly in themselves, they are not so obtrusive as to coax the eye to wander from the goods to the "silent salesman."

"License Plate" to Advertise Bearings.

Mixed in with the rest of the mail, and even when not so mixed, it looks exactly like a regulation license plate; it is of a real bright red, with white figures, is the right size and shape and the lay-out is correct, even to the provision of four slots for the straps. Upon closer examination, however, it proves to be a novel and decidedly striking advertisement for the Hyatt Roller Bearing Co. of Detroit; the "license number" is "1913," of course. It is formed of cardboard. At the left end the word "Hyatt" appears at the top and "U. S. A." at the bottom, and between them is a picture of a Hyatt roller bearing—the connecting link between Hyatt and the U. S. A. It is one of those effective advertising "hits" that compel comment.

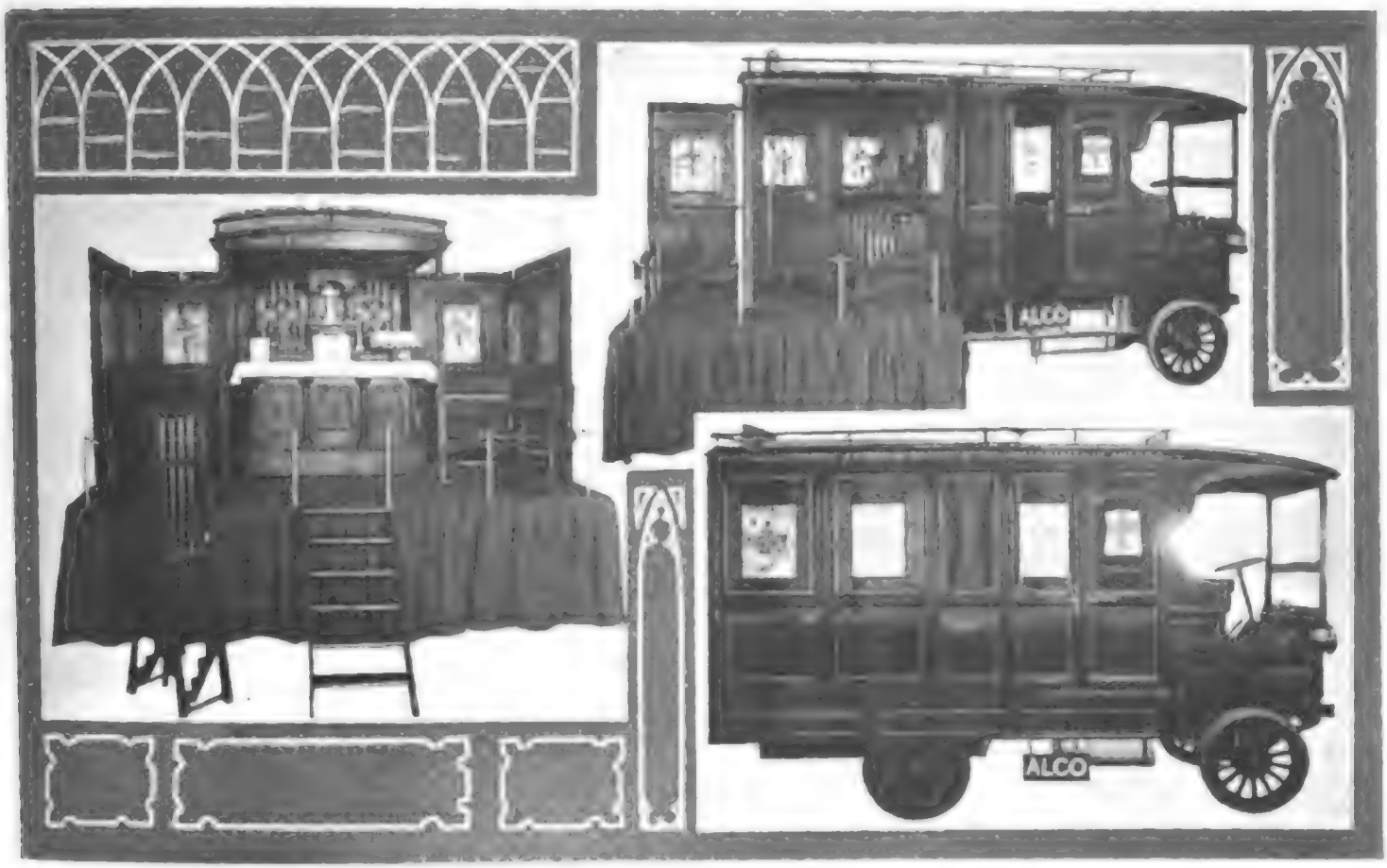
Wire Netting for Sandy Highways.

Apparently overlooking the fact that strips of canvas, which are very much lighter and can be folded up into very much smaller compass, will serve the same purpose, one motorist has hit upon the not very novel scheme of carrying around with him a roll of wire netting for use in helping him over sandy spots. The modus operandi is to place the netting under the wheels in order to get a "bite" on the road. No doubt a roll of fairly fine mesh netting would serve a useful purpose for deep mud, or for ice or snow, but for sand the canvas would serve just as well and it has the additional advantage that it is very much more easily carried than the bulky and awkward wire netting.

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CARRYING RELIGION FAR AFIELD ON WHEELS

Catholic Church Extension Society Evolves a Portable Chapel With Which to Penetrate Texan Wildernesses and Spread the Gospel—Confessions and Illustrated Lectures Also Provided For.



THREE VIEWS OF MOTOR CHAPEL, SHOWING DETAILS OF ECCLESIASTICAL EQUIPMENT

If the mountain will not go to Mahomet, Mahomet must go to the mountain, according to the old saying, which, thanks to the motor chapel, shown in the accompanying illustrations, may be paraphrased: If the people cannot go to church, the church must go to the people. In many sparsely settled districts where the population is insufficient to support a church, as well as in small settlements where there are no churches and which are not reached by railroads and therefore are inaccessible to railroad chapels, there are people who would go to church if they had the opportunity, and it is with the purpose of affording such opportunity that the motor chapel, which was one of the exhibits at the Chicago motor truck show, was built.

The novel little church is erected on an Alco truck chassis of two tons capacity; the work was done by the American Locomotive Co., for the Catholic Church Extension Society, which will put the machine into service in isolated districts of Texas. The official designation is Motor Chapel St. Peter. Two priests will be in charge, and stops will be made at various places for from one to two weeks.

The rear part of the body of the car is arranged to open out, as shown in the illustrations, disclosing the orthodox ecclesiastical equipment of the Catholic Church; accommodation for a congregation of 200 is provided by a large tent carried, when not in use, on top of the car. With the aid of the electric lighting plant which is part of the mechanical equipment of the machine, stereopticon lectures, as well as religious services, will be given. In addition to the other ecclesiastical equipment, there is, as there should be, a confessional. It is of the orthodox pattern, except that it is arranged to fold into small compass.

In addition to being a moving church, the car will be the home of the priests while on the road, and a compartment is arranged as a living room, having a storage space for personal effects, lockers for folding cots, a typewriter with desk and drawers for a supply of stationery, etc., and a moderate stock of provisions and the requisite cooking and other utensils. A separate compartment contains a lavatory, supplies of towels, drinking water and medicine chest. Among other items, the equipment includes a folding organ, a set of large tubular bells for outside use and a small chime of bells for interior use.

The over-all length of the car is 21 feet and the width 6 feet 9 inches; the height to the top of the car is 11 feet 5 inches. The exterior finish is gray, with gold lettering, and the decoration includes the coat-of-arms of the society. The eight "cathedral" windows serve effectually to distinguish the car from a commercial vehicle, quite apart from the lettering. The motor chapel was built at a total cost, including equipment, of about $8,500.

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HOLDS PATENTEES CANNOT CONTROL RE-SALE PRICES

(Continued from page 12.)

"But in the Waltham case," continued Dean, when his opinion was sought, "the counsel on both sides and Judge Ray seem to have treated this mere contract as if it were in fact a conditional license, notwithstanding the well-settled state of the law distinguishing between the conditional patent license and a mere contract."

"It is because of this apparent confusion of two different principles in law," continued Mr. Dean, "that the decision of Judge Ray has created such a stir, for that justice apparently has not only held that the Waltham contract is void under the Sherman law but has gone out of his way to say that in his opinion all attempts of the patentee to control the resale price of a patented article are outside of the patent law, and are within the Sherman act. The trend of his argument apparently is that while the patentee has three separate rights—namely, the right to make, the right to use, and the right to sell—and that while the patentee may dispose of one of these rights without disposing of any of the others, nevertheless in the case of sale, the long line of decisions in this district and other districts as well as in this circuit and other circuits are in error in holding that the patentee cannot sell a finished article subject to conditions that the device cannot be used or sold until certain conditions of the licensor are complied with.

"Judge Ray goes so far as to admit that the patentee can license another to manufacture and sell and to fix the price at which the licensee shall sell. If, however, he tries to license a man to sell at fixed price without also giving him the right to manufacture, he brings himself within the Sherman act.

"The decision is anomalous in so many ways that a full legal analysis must await an opportunity to study the full decision. The two things evident at the present time being that the Waltham Watch Co. sold under a plain contract, breach of which gave them the right to reclaim the goods, instead of under a conditional license, breach of which would terminate the license and constitute infringement of the patent; the other evident fact is that Judge Ray has not contented himself with holding this contract illegal under the Sherman act, but has gone beyond that and stated his opinion that when the patentee once accepts full pay for his patented article, he is compelled to release to the purchaser every other patent right or license which courts have heretofore held he has a right to reserve and specifically that such patentee, vendor, cannot fix resale prices.

"The important question in the profession seems to be how much of Judge Ray's opinion shall be considered as obiter dicta (passing remarks) and how much was really decided. Some lawyers go so far as to say that the true cause of action as disclosed by the facts of this case should have been a suit at law for violation of contract; that there was no real question of infringement of any patent and that the United States Equity Court had no jurisdiction under the patent statute.

"Judge Ray attempts to distinguish from the Dick vs. Henry case recently decided by the United States Supreme Court on the grounds that the Mimeograph was sold for cost and the patentee's profit came from the sale of ink, whereas in this case, the watch company gets full price in advance and nothing afterward. This overlooks the fundamental idea of the whole price license system. The patentee does not try to keep up the retail price in order to bleed the public.

"His object is to enable the dealer to make a profit which will enable the dealer to advertise and exploit and otherwise push the sale of the patented article. It is simply one way of hiring the dealer to drum up retail trade on the patented article and also should prevent department stores and other large corporations from underselling small dealers."

Aristos and Former Agent Lock Horns.

The old nursery rhyme of how "the cat began to chase the rat, the rat began to gnaw the rope, the rope began to hang the butcher," etc., finds a diminutive corollary in the affairs of the Ignition Starter Co., of Detroit, maker of the Disco starting and lighting system, for while it has been generally known that the Aristos Co., then the Disco eastern distributer, and the manufacturing company were locked in litigation, another suit has been set down for trial this month in the Supreme Court for New York county, in which, however, it is the Motor Specialties Co., of Philadelphia, Pa., that is the complainant and the Aristos Co. is the defendant.

Claims which were made by the Aristos Co. in its suit for damages of $43,000 in the Supreme Court for New York county to the effect that the Disco acetylene starter was defective and unsatisfactory are reiterated in the Motor Specialties' complaint and it is alleged that the resulting damage and loss of profits amounted to $40,000; $25,000 represents what is claimed to have been paid for goods and the remainder is for profits which never were realized. The Aristos Co. disclaims liability and has entered a counterclaim for a balance of $1,131.11 on a total account of $19,567.76.

The Aristos Co. is not the only litigant which has filed a counterclaim, for after it sued the Ignition company last summer the latter brought a counter suit in Detroit for $304,000.

Koehler Fails to Upset Goodyear Verdict.

Although thus far unsuccessful, the H. J. Koehler Co., Hupmobile dealer in New York City and adjacent territory, is endeavoring to overturn a verdict which two New York City courts have rendered in favor of Frank Goodyear, who was a Hupmobile sub-dealer in Waterbury, Conn., about two years ago; the courts have ordered the Koehler company to pay Goodyear $490 and thus far the former has not succeeded in reversing the decision.

Goodyear contracted to sell 20 Hupmobiles in Waterbury and made a deposit of $25 on each car, this amount being deducted from the price of each car as Goodyear received it; he sold six cars in Waterbury and then declared he had reached the city's limit in the Hupmobile line. He asked for the return of his deposit, but it was refused, he then sued in the Municipal Court on the ground that there was a lack of mutuality in the contract and was awarded a verdict which the Appellate Term of the Supreme Court for New York county last week affirmed. The Koehler company, it is stated, contemplates carrying the case to the Appellate Division.

Wheels and Tires Are Not "Parts."

Reversing the ruling of Collector Loeb of the Port of New York, the Board of United States General Appraisers has decided that the tariff act of 1909 requires that automobile wheels and tires be assessed for duty separately, the decision being rendered in the case of Thomas Meadows & Co. and Irving Katz. Collector Loeb held that as tires and wheels were assembled articles they were properly dutiable at 45 per cent. ad valorem as "parts of automobiles." The board of appraisers, however, sustain the claim of the importers, who maintain that the tires should be granted a rating of 35 per cent. ad valorem as "manufactures of rubber," the board pointing out that tires are expressly excluded from paragraph 141, which covers "finished parts of automobiles."

New York Dealer Sued by Indianans.

Claiming that Bertrand D. Banker, who trades in Meridian, Cayuga county, N. Y., as the B. D. Banker Hardware Co., failed to pay in full for goods delivered to him, the Wayne Oil Tank & Pump Co., of Fort Wayne, Ind., has brought suit against him in the Supreme Court for New York county; the claim is that Banker's total bill was $145 and that he paid but $70. The goods were purchased June 17, 1912.

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METHODS THAT PROMOTE THE SALE OF CARS

Observations Made and Recommendations Offered by a Prominent Manufacturer—Five Types of Prospects Defined and the Best Ways of Handling Them Suggested—Letting Customers Sell to Themselves.

"Don't take it for granted when a man walks into your salesroom, or consents to a demonstration, that he is half sold. This is merely an introduction and it is still up to you to make the sale.

Appearances May Be Deceptive.

"And you can't tell from the cut of a man's coat how much money he has in the bank. Selling automobiles is a merchandising proposition pure and simple, and it is your duty to give the customer the same amount of courtesy and attention that he receives in any high-class store. Buyers appreciate courtesy."

This is the first advice in "How to Sell More Motor Cars," a pocket-size booklet recently issued by the National Motor Vehicle Co., of Indianapolis, and which is of the sort that well repays careful reading. Wholly apart from the comparatively brief plea for National cars which it contains, the booklet is uncommonly strong in salessense and cannot well fail to sharpen the wits of salesmen who realize the necessity for that sort of thing.

"As John Lee Mahin once said: 'The buying unit is the family,' and you should as soon as possible ascertain the purpose to which the buyer wishes to put the car—who else is to be considered besides the prospect—and then shape your arguments accordingly," continues "How to Sell More Motor Cars."

Inattention that Lost a Sale.

"Here is an actual instance: A man walked into the salesroom of a Kansas City dealer about ten days ago. He was just an ordinary looking human being, possibly not quite up to the average in appearance. He did not walk right up to the proprietor, but wandered around among the cars on the floor. The dealer happened to be talking to a friend and was in the middle of a detailed description of a show he had seen the night before—so he allowed the unimportant looking stranger to remain unnoticed.

"The cars could not talk—they can't sell themselves unaided, so the man finally walked out.

"Just across the street there was a salesroom with newly painted front. A car was displayed attractively in the show window and the atmosphere of the whole establishment was up-to-date business methods. The window was clean and the interior presented an attractive, enterprising, inviting appearance. When the stranger stopped in front of the window a salesman immediately opened the door and invited him to step inside where he could get a much better view of the car.

"Drawing Out" the Prospect.

"Once inside, the salesman asked: 'Have you ever had any experience in operating a car?' This was a safe question, and it opened the door at once for a friendly discussion. Every man is eager to tell about his own motor experiences, even if he has at one time owned even an antiquated one-cylinder model. As the prospect told his experiences the salesman, without antagonizing him, was able to draw comparisons between the car the prospect once owned and the new car on display. No matter what car a prospect has driven, he does not want his judgment questioned.

"Often a man is just as sensitive to criticism about his car as he would be about his wife.

Buyer His Own Best Salesman.

"During the discussion the prospective customer mentioned the fact that his old car was not adapted for use by his wife and daughter. Owing to this bit of information the dealer then called the prospect's attention to the fact that the car on display permitted access to both front doors and allowed a lady passenger in the front seat with the driver to always be able to step out upon the curb and not be compelled to walk around the car in order to get to the sidewalk.

"As the conversation progressed, the prospect was unconsciously being sold and was led up to the point where he himself asked for a demonstration, with the result that the entire family as a unit bought the car.

Tact and its Influence on Sales.

"The salesman sold the car without the prospect realizing that he was being forced to buy. The main thing is to allow the prospect to think he is buying the car, while in reality you are selling it to him.

"The moral of all this is, that no matter how good your car may be it cannot possibly sell itself alone.

"This is just an example of one type of buyers—the man who has owned a car and who goes "shopping" when he buys.

"Know your man before you try to sell him. By using a little tact, any dealer can ascertain the purpose to which the prospect intends to put the car he buys—whether or not it is for family use, personal, pleasure, cross-country touring or for business purposes.

Five Types of Buyers Segregated.

"Experience in selling motor cars teaches that all prospective buyers may be separated into five main classes:

"(a) Price Tag.—The man who is looking for a bargain regardless of the age and often regardless of the condition of the car—just so that he gets a car that will run.

"A second-hand car or any old car will do.

"This class of buyers is limited usually to the 'wage earners,' who hesitate between a motorcycle and a second-hand motor car. Before wasting any time on him, find out how much real money he has to invest and unless he has cash on hand pass him up, courteously but quickly. Remember your time is valuable—your expenses are going on while you are talking to him.

David Harums as Car Buyers.

"(b) Second-Hand Fiend.—This man is a shrewd buyer; he is the David Harum of the automobile business, usually with little money and trying to unload on to you.

"In the first place he bought a much-used second-hand car. Then he invested a little more money and traded it with a friend for a better car, hoping that he could unload his new purchase on you by paying a small amount of cash and getting a brand new, up-to-date model.

"Don't let your desire to move a car from the salesroom to the street lead you into an unbusinesslike transaction. Just remember that the second-hand car may prove a White Elephant on your hands. (It costs just about as much money to keep capital tied up in a second-hand unsalable car as it would to feed and care for an elephant.)

"Rather than do this, let him go. Concentrate your time and energy upon the man who has cash in the bank. It is just as

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much to know where not to work as where to work.

"There are exceptional cases, however, especially where a man owns a car that you sold him, and who wants to buy a new model from you.

Classifying Possible Purchasers.

"Tack this up on your wall over your office desk:

"'A certified check in your bank book ready for deposit is worth more than a second-hand car on the floor.'

"(c) Appearance and Pleasure.—This man is influenced largely by the lines of the car and the anticipation of the pleasure he is going to get out of it. He is usually in a hurry to buy. He belongs to that rapidly disappearing class that used to walk in and buy a car in ten minutes.

"It does not require a salesman to sell this man. But the wise, hard-headed, shrewd dealer with a view to his permanent success, will analyze this man's requirements and sell him the car best fitted to his needs, so that the sale will not act as a boomerang.

"(d) Social Prestige and Reputation.—This is the man who usually buys a car to please his wife with social aspirations. She knows absolutely nothing about a car, but has received the impression some way that 'to be anybody' she must have a nameplate with an artificial value rather than a car of merit.

"How have you been handling this class of buyers?

Selling the Average Buyer.

"A thorough analysis of sales made by successful dealers proves that this prospect, if handled right, is always easy to sell. The approach in this case is through the man of the house who realizes that $5,000 is 5 per cent. on $100,000, and when shown point for point that a car selling for $2,750 will give as good or better service, with accompanying elegance and atmosphere of refinement, he will not waste two or three thousand dollars on some fancy of his household.

"No matter how much money this man is worth, he is not willing to waste two or three thousand dollars on a nameplate. You as a dealer will sell more cars and make more money by giving your customers real value.

"(e) Service and Business.—This man represents the large majority of buyers to-day. He is motor-educated. He has probably owned a car before or else has made a very thorough study of motor car construction and is taking the advice of friends and benefiting by their experience.

"While this man is open to reason, he is not going to buy in a hurry.

"Before deciding he will get underneath the paint and the hood. Your first move is to as tactfully as possible ascertain if influence is being brought to bear upon him in favor of a particular car by some neighbor or friend. Then you will know what cars you are in competition with and what bias and prejudices you will have to overcome before you can make the sale.

"Probably the neighbor or friend of this prospective buyer owns a car that is not up-to-date, although it is apparently giving good service. And right here is where your salesmanship is tested.

Influence of Advertising "Copy."

"Prove to this prospective buyer that the car you are selling with left-side drive and center control (for example) is a year or more ahead of other cars, as a consequence next year it will still be up-to-date and will also demand a much higher second-hand value, taking it for granted, of course, that you are able point for point to show where your car will give as great or better service than the car owned by the neighbor or friend of your customer.

"All Buyers.—The majority of buyers are influenced greatly by Printers' Ink. They have more or less definite opinions of various cars formed by what they have read about them. Therefore, as a fundamental principle, you should not risk your time or money on an unknown car. A car, whose name is a household word, is naturally much easier to sell than a car that the prospective buyer has never heard of before. The well advertised and tested car means quicker and more frequent sales. Especially is this true with a car that has demonstrated its superiority in public contests such as races.

Benefit Derived from Service.

"Remember, a quick sale is more profitable than a slow sale.

"The modern automobile dealer is the one who is equipped to take care of his customers, especially if the buyer intends to drive the car himself.

"A little service and assistance gives the owner the feeling of confidence and good will toward both you and the car.

"Service means satisfied customers, and satisfied customers mean a permanent profitable business for you.

"Service also converts probable knockers into positive boosters. If your success is to be lasting, every man to whom you sell a car must, one year or more from date of sale, be as enthusiastic as the day on which he bought the car from you.

"This is possible by first giving real value and second by taking care of him. . . .

"If you are an experienced dealer you know that the sales methods used five or more years ago are not the methods that will sell cars to-day. Or, on the other hand, if you are new at the business, much will depend upon just how you begin."

Buda Adds a "Little Six" Motor.

Supplementing an already extensive line of motors of both the four- and six-cylinder type, the Buda Co., of Harvey, Ill., has brought out a new "little six," which, in conformity with the general tendency of the times, has its cylinders cast in a single rigid block; further increasing simplicity, the valves all are located on the same side, which construction facilitates their effective cooling and makes comparatively easy their enclosure by means of light metallic cover plates. In common with the other Buda motors in the line, the cams and camshafts are forged integral from open hearth steel, the cams themselves being case hardened the better to withstand wear. The oiling system is of the self-contained type, the oil being pumped from a crankcase reservoir to the top of the main bearings, whence it overflows into pockets into which the connecting rods dip.

Leaving little room for doubt regarding the aptness of the designation long-stroke, the cylinders measure 3¾ inches bore and 5½ inches stroke, the rating therefore being 45 horsepower, though it is no secret that this figure is easily exceeded. Cooling is by pump circulated water and in the design particular pains have been taken to ensure uniform cooling of the valves and valve pockets. To this end, the cool water is led in from the bottom of the radiator to liberal spaces directly beneath the valves, where suitably placed baffle plates ensure proper circulation. The exhaust manifold is provided with radiating fins to assist in the dissipation of heat. Quite as a matter of course, the motor is arranged for three-point support and provision is made for the mounting of any of the standard types of electric lighting and engine starting systems, as well as for a four-cylinder air compressor, enclosed gearing and an engaging lever being provided for the latter.

Home Made Case Hardening Material.

Case hardening, as a rule, is accomplished with the use of ground raw bone or bone black, and in some cases burned leather. Better than either of these is hydrocarbonated bone black, which is prepared by grinding pure white and hard bone which has been freed from pith and grease. It then is placed in sealed retorts and charred by a slow and uniform heat. When taken from the retort it is charged with carbon extracted from crude oil while it still it hot, thus filling all of the pores in the bone black to the exclusion of moisture, which seriously interferes with the proper working of the case hardening process.

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IGHTING THE INTERIOR OF THE LIMOUSINE BODY

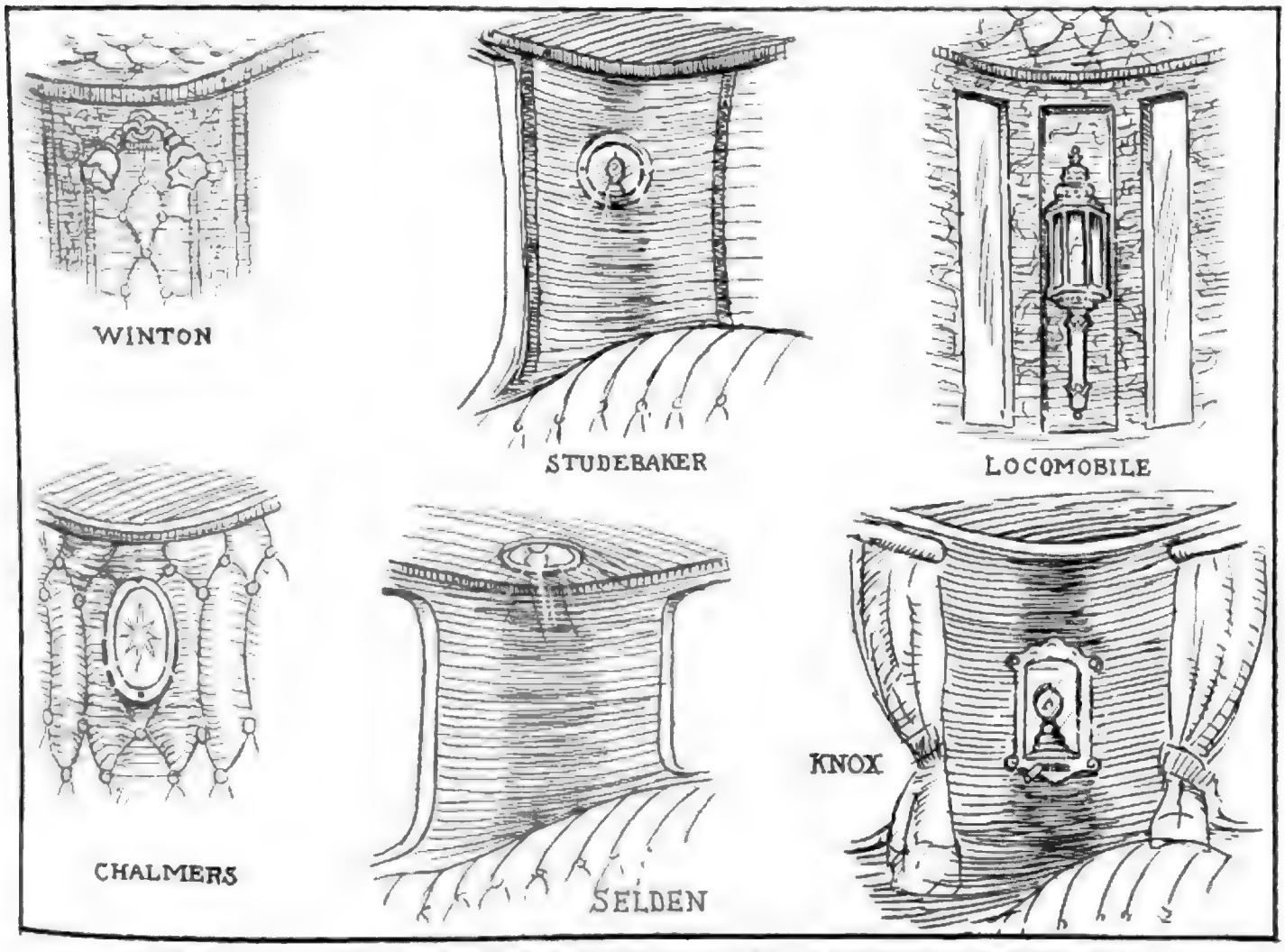
Useful and Decorative Ends Served by Several Methods In Use and the Reason Behind Them—Importance of Positioning.

Lighting the interior of the limousine may be easy—that is, comparatively easy—or it may be hard, according to whether the object sought is merely "to counterfeit a glorious gleam" or to add a touch of decorative effect, or both; it is not very easy to obtain distinctiveness and individuality and it is very easy to follow the "dead level of monotony" as regards the effectiveness of the lighting scheme or the sought-for embellishment. Still, that it is possible to obtain considerable variety both in designs and positioning is revealed by the accompanying illustration, which shows six solutions of the problem in which both utility and decorative properties are inherent in some and plain utility is apparent in others.

As far as utility is concerned, it is apparent that to be effective for reading purposes the light must be over the shoulder. Which fact, coupled with the ease of so mounting them, accounts in a measure for the preponderence of the "Pullman" style of corner lamp, a fixture which lends itself to plainness or illumination—in both senses—quite easily. Generally, such lamps, as in the Knox picture, for instance, are arranged to turn on a central pivot, the action of turning them serving at one operation to switch on the current and to bring the lamp itself out of its temporary retirement. When the lamp is extinguished it is invisible; nothing remains but a plain nickeled plate.

The perfectly plain flush lamp, whether it be round, oval, square or any other shape, manifestly is the simplest of all and with the aid of a little ingenuity on the part of the glazier can be made really decorative. As witness the Chalmers lamp, in which the glass is ground with the exception of a deeply cut central star. The Studebaker lamp is devoid of ornamentation of any kind and is one of the few that can be suspected of serving a useful purpose rather than a decorative one. The same applies also to the Selden lamp, the only difference being that it is inserted in the roof instead of in one of the corners. Its position is slightly different from that of the usual roof light, however, in that it is placed quite near to the corner where its beams will be cast over whatever the passenger may find interesting enough to read; a duplicate is located in the other roof corner, of course.

Where real decorative effect is desired, there are few things that lend themselves more readily to the touch of the artist than do electric lamps. Which fact, apparently, is known to Winton and Locomobile designers and it has been taken advantage of to the fullest extent possible. In the one, the lamp bracket is a double one from which depend two arms each carrying a socket and a receptacle for a decorative shade. In the other, which, by the way, is fitted to a really luxurious limousine fitted out in maroon broadcloth and finished off with gold-plated trimmings, a really ornate pillar lamp fills the corner and serves to add a touch of distinction that could not be obtained in any other manner.



STUDY OF LIMOUSINE LIGHTING METHODS, SHOWING VARIETY IN DESIGN AND POSITIONING

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SUPREME COURT DISSECTS A MOTOR TRUCK GUARANTEE

(Continued from page 7.)

"The company is to be given any opportunity which it desires to make the machine satisfactory and economical before it is returned.

"The above guarantee is upon condition that only men furnished or indorsed by the company operate the machine during trial periods as above referred to."

During the first 15 days of service the truck was operated by a chauffeur in the employ of the vendor, but its operation was not satisfactory to the purchasers, who so informed the representative of the Reliance dealer, one Sanders. The latter expressed his employer's intention "to make the machine satisfactory," but all efforts to that end proved unsatisfactory to the purchasers. On May 28th, 17 days after delivery of the truck, when the complaint was renewed, these reassurances were repeated, and on May 30th the final payment was made by check.

In the lower court, when the defendants objected to statements of Sanders as being construed to vary the terms of the contract the objection was sustained and that evidence was stricken out. The supreme court, however, holds that the evidence was competent. On this point the higher court says:

"Sanders had not signed the contract in behalf of the vendor, but he had conducted the final negotiations and had entire charge of the execution of the contract with respect to fulfilling the obligations of the vendor and to complaints concerning the operation of the truck; and, as has been seen, the agent who was sent out to collect the final payment referred the vendee's representative to Sanders to adjust the matter when payment was refused on the ground that the vendor had not performed. Moreover, according to the testimony of the vendee, Carroll, the general manager of the vendor, informed him that Sanders had charge of the automobile department, and when complaint was made with respect to the operation of this truck he said: 'Well, I have nothing to do with that. You will have to see Mr. Sanders; he has charge of that and you will have to fix it with him'; and this was not specifically denied by Carroll, who was subsequently called as a witness for defendant. Furthermore, it appears that Sanders in his correspondence for the defendant, to some extent at least, used a rubber stamp by which his name was signed as 'manager,' but Carroll says that he was not aware of this. Sanders was not a witness upon the trial."

The Dochtermann company continued to use the truck until September 27, 1907, during a large part of which period it was in a repair shop. While it was being removed therefrom the shaft broke and the plaintiffs then served notice that unless a new and satisfactory truck was supplied they would be obliged to sue for the return of their money. Later they were informed that the Reliance dealer would do nothing further until the Dochtermann people paid for the repairs, amounting to more than $200. Suit was then instituted and the defendants interposed a counterclaim for the repairs and for the services of a chauffeur for 10 days, but on the trial the counterclaim was withdrawn.

"Notwithstanding the fact that some of the evidence tending to show that the final payment was made by the vendee on the express representation that if the vendor was unable to change the machine so that it would work satisfactorily the money was to be returned was struck out," says the Supreme Court in its decision, "still the issue was submitted to the jury as if that evidence was sufficient to show an agreement on the part of Sanders for the return of the money if the machine could not be made satisfactory, for the court submitted to the jury the question as to whether or not Sanders was authorized by the vendor to change the contract and instructed the jury, in effect, that unless Sanders was so authorized the plaintiff could not recover. It is alleged in the complaint that the second payment was made on that agreement. The attention of the court in submitting the case to the jury was not drawn to the fact that some of the evidence bearing on this proposition had been stricken out, and it was not claimed that the evidence remaining in the case was insufficient to show that Sanders had undertaken to agree for the vendor to repay the money if the machine could not be so changed that it would work satisfactorily. The real question of fact presented to the jury was with respect to Sanders's authority to make such an agreement for the vendor."

Under the circumstances brought out at the trial, the Supreme Court declares, "it is not to be inferred that the complaint was dismissed upon the theory that the evidence was insufficient to show that the second payment was made on the agreement on the part of Sanders that it would be repaid if the truck was not so altered as to do the work of the vendee satisfactorily, for, as already observed, it was submitted to the jury upon the theory that there was sufficient evidence of a parol understanding between Sanders and the treasurer of the vendee to that effect. Nor can the dismissal be sustained upon the theory that Sanders was not authorized to make such an agreement. On the uncontroverted evidence the vendee was justified in refusing to accept the truck and in tendering its return at the expiration of the 15th day, and in demanding the return of the down payment. The vendor, however, by the express terms of the contract was entitled to further time to endeavor to perform on its part. During that period the vendee would have been justified in refusing to make the final payment; but it appears that the vendor manifested confidence in its ability to make such change and alterations in the truck as would be a compliance with the contract.

"In the circumstances it is quite clear that if the vendee was induced to make the final payment on the assurance that the vendor could and would fulfill its contract, such payment would be subject to the terms of the contract with respect to the original payment, and on the failure of the vendor to perform within a reasonable time the vendee would be entitled to a return of the amount paid. Regardless of whether Sanders originally had authority to change the contract or to make a new one, the vendor could not accept the vendee's money in these circumstances without becoming liable to return it if this payment was induced by representations on the part of the vendor's agent such as are claimed to have been made. Sanders unquestionably at this time was representing the vendor both with respect to performing its contract and requiring performance on the part of the vendee, and his principal is chargeable with knowledge of the negotiations which he had with the vendee which resulted in the final payment.

"It is contended in behalf of the respondent that at the expiration of the 15 days by the terms of the contract the final payment became due and payable, and that, as matter of law, regardless of whether any representation was made by Sanders with respect to the repayment of the money, the vendee would be entitled to a return of both payments if it ultimately appeared that the truck of which vendee justly complained at that time could not be made to comply with the contract, or that the vendor abandoned further efforts in that direction, and on that theory there would be no question for the jury. We are of opinion, therefore, that the court erred in dismissing the complaint."

Miller Embraces Parcel Post Service.

Charles E. Miller, the well-known New York supplyman, is one of the those who have to do with automobile accessories who is making the most of the new parcel post service. He is offering to send automobile supplies within the 11-pound limit by parcel post without charge for postage. On shipments that are too large or too heavy to go by post, he also has adopted the plan of paying freight or express charges.

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REPAIR OF TIMING GEAR THAT MET AN EMERGENCY

Fiber Idler Was Badly Damaged by Contact With a Nut Carelessly Left in Gearcase—"Doubling Up" That Was Effective.

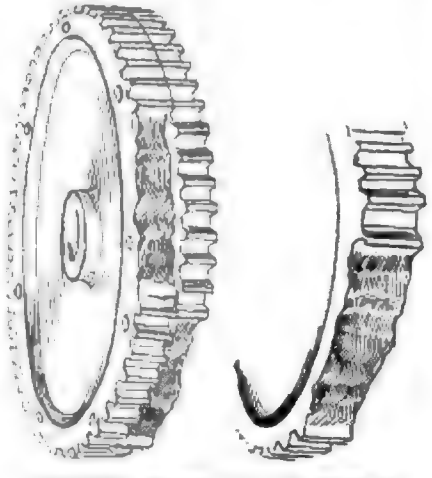
There are many, perhaps, who fancy that as a power transmitter a stripped gear is about as good as no gear at all, and it may be added that in nine cases out of ten the assumptions of the many are not over far from being correct. But on occasion—of course very much depends upon the circumstances—that a marred gear wheel can be made to function properly for the interval necessary to effect the much needed replacement of the damaged part was demonstrated one day last summer.

It happened on the very last leg of a tour: the afternoon was about half gone and 25 miles more were to be covered before hotel accommodations could be reached. The car struck a bad rut and immediately afterward the motor "went bad"—brought up dead with a crunch of grinding metal. Little search was required to reveal that the valves were not operating when the motor was turned over and opening the timing gearcase cover disclosed the reason. A nut which had been carelessly left in the bottom of the case had been thrown up by the leap of the car and had been caught between the timing gear teeth and the idler gear, which happened to be fibre, was the sufferer, and emerged from the conflict minus four needed teeth.

A survey of the surrounding country revealed nothing more promising in the way of a "service department" than a wheelwright's shop about half a mile further down the road; a horse being pressed into service, the car was towed to that point of vantage. The wheelwright was possessed of a fair assortment of tools, none, however, that were adaptable to the purpose in hand save a generously proportioned vise mounted on a solid work table.

Speculation as to how the repair was to be made—for it was unanimously agreed that a repair must be made if the car was not to be left at the point for two weeks awaiting the arrival of a new gear—was long drawn out and methods such as the insertion of pins in place of the damaged teeth or wrapping the wheel rim with bare wire at the points where the teeth were missing, the strands being soldered together, were considered from all angles and finally abandoned as impractical. It was the shop proprietor who finally suggested the remedy and it was he who did the work, too.

The wheel was mounted in the vise and sawn directly in half, so that two wheels were produced, each with teeth of narrow face, as is shown in the accompanying sketch. The rough faces which resulted from this operation were smoothed off as much as was possible with the old file which the tool kit bore, and the two wheels were placed together again, but their relative position was altered—one was advanced over the other—so that the teeth on the wheel were continuous all the way around. Of course, in two places, where the original teeth had been demolished by contact with the nut, the teeth were but half of the original width, but that was sufficient to



STRIPPED GEAR AND ITS REPAIR

bear the strain for the time being. Clamped in the vise in this relation, holes were drilled through the rim spaced about an inch apart all the way around. Brass escutcheon pins were pressed into service as rivets and were inserted in the holes and headed with a peen hammer after the holes had been slightly countersunk both front and back so as to insure the hold of the rivets.

Naturally the keyway, after the wheels were riveted together in the new position, was no longer continuous. The matter was corrected by recutting the keyway in one half of the wheel so that the new way corresponded with the old way in the other half. To this end the hacksaw was again pressed into service to make the side cuts and the slot was cut out to the proper depth with a very narrow chisel which was "brushed up" on an oil stone.

When the wheel was finished and in place it was found that it did not run exactly true—which was to be expected. Upon the motor being retimed, however, the wheel served its purpose perfectly, that is, it caused the valve mechanism to function perfectly, although not a little noise was emitted by the timing gear train owing to the "wobble" of the wheel and the fact that several of the teeth which were not wholly obliterated were damaged.

KEEPING COOLING SYSTEMS WARM IN WINTER WEATHER

What Happens When Frost Penetrates —Supplying Heat to Melt the Ice—An Emergency Job of Thawing Out.

One of the most striking demonstrations of the effect of over-cooling on a gasolene motor may be had on any really cold day by stopping the car and throttling the motor, while thoroughly heated, until it is running at its minimum speed—that is, so that a little more throttling would cause it to stop. If the motor is allowed to run for a time the chances are that it will stop before long, owing to the gradual cooling that takes place, unless, of course, the radiator is protected from the air and the rapid loss of heat prevented by a shield, or robe.

Obviously, it is a wise precaution to leave the motor running a little faster in winter than in summer and, in case of extreme cold, to cover the radiator as well. Not a few motor stoppages, sometimes with disastrous results due to freezing up, have occurred through neglect of this little matter. Incidentally, if it is suspected that freezing has started in the circulating system of a motor that has stopped in the cold, it is decidedly risky to put much strength into the first pull on the crank. The leverage on the pump and its shaft, due to the two-to-one gear reduction and the length of the crank handle, is very considerable, and the pump is apt to be the first thing—at least, in some cars—to feel the frost. The pump is normally at the point where the water is coolest, drawing, as it does, from the bottom of the radiator after the water has passed through from the top, and this, together with the fact that its low position removes it from the influence of most of the engine's heat, makes it rather vulnerable to the effects of frost.

Thawing a radiator out of doors in very cold weather is apt to be rather more difficult than might at first appear to be the case. Presuming that the water at the bottom has frozen while that at the top is merely icy cold, pouring hot water in can have little or no effect for the simple reason that there is not likely to be room enough for sufficient hot water to do any appreciable good, and of course the drain cock and the way to it will be effectually blocked by ice. The best thing to do is to get the engine running slowly with the fan belt off; the gradual warming up will extend to the radiator by degrees. When there appears to be any chance of water getting to the drain cock, matters may be facilitated by thawing it out and leaving it

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open, so that the cold water may be removed to make room for hot water to be poured in at the top.

A scheme that worked once at least, and might be worked in many cases, hurried up the thawing of a frozen radiator very considerably. The freezing in this particular case extended apparently about four or five inches up from the bottom of the radiator. It was a bitterly cold day; getting indoors was out of the question; and the only resources were those right on the machine, which was a big truck. The pump was frozen up hard, so it was disconnected by means of a joint in its shaft; the fan belt was removed and, after a great deal of priming and cranking, cranking and priming, the motor was started. It warmed up by degrees, but the radiator was discouragingly slow in responding to the heat. Presently one of the half-frozen crew stopped stamping his feet and swinging his arms to look hard at the fan for a moment. Then he rummaged out of the tool-box a couple of long pieces of belt-lacing and made of them a temporary fan-belt, which he applied crossed, so that the fan was made to rotate in the reverse of its normal direction.

The idea was to draw the warm air out of the hood and blow it against the radiator, and the result was almost magical. It was only a short time before the radiator thawed out. Meantime the pump had been disconnected and removed and laid on the exhaust pipe to thaw out, which it did, and it was not long before everything was again in normal running condition. Of course this was rather an extreme case. The water could not be drained off and there was no shelter available; to let the car stand would have meant the cracking of the water jackets and the bursting of the radiator, if nothing worse, so that it was well worth while to go to some trouble to make use of the heat generated by the engine itself.

Most of the water in the cooling system had boiled away by the time things thawed out, but there was plenty of snow around and there was a tin pail which, filled with the "beautiful," was set on the exhaust pipe to "cook," and in this way the deficiency in the supply was made up sufficiently to run the machine.

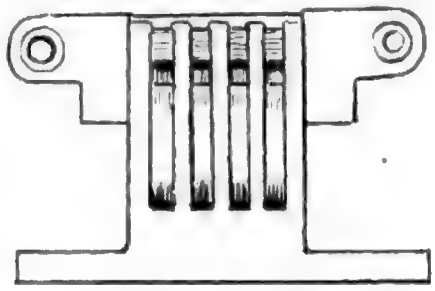
Dayton Dealers Made Brave Display.

Dayton's second annual show, under the auspices of the Dayton Automobile Club, was inaugurated in Memorial Hall on Monday evening last, 17th inst., to hold forth throughout the remainder of the week. Beneath the usual canopy of vari-colored bunting with which the interior of the building is disguised for the occasion, and perfectly illuminated by the glow from myriad incandescent lights festooned along the aisles, 30 different makes of cars are shown by 20 dealers; accessories are displayed by half a dozen dealers in those various needful appurtenances.

The cars on display are: Cadillac, Pierce-Arrow, Mitchell, R. C. H., Hupp-Yeats electric, Overland, Locomobile, Standard, Marmon, Cutting, Paige-Detroit, Warren, Abbott-Detroit, Chalmers, Buick, Peerless, White, Baker electric, Marathon, Reo, Ford, Hupmobile, Marion, American, Republic, Pathfinder, Speedwell, Winton, Stoddard-Dayton.

Invisible Hinge of Many Purposes.

The amount of hard work that falls upon the hinges of automobile doors is all out of proportion to the amount of consideration that the average car owner bestows upon them, unless they allow the door to sag, or



SOSS INVISIBLE HINGE

project so much as to be more than ordinarily unsightly. No hinge is entitled to be described as a thing of beauty. The prevailing tendency to make car bodies perfectly flush makes the ordinary projecting hinge particularly conspicuous, and it is the aim of the Soss Mfg. Co., of 435 Atlantic avenue, Brooklyn, N. Y., to produce hinges that will be invisible when the door is closed, while improving upon other hinges in other respects.

The principle of the Soss hinge is that of a joint made up of a number of bearing surfaces or plates which slide together and fold into a recess in the door post when the door is closed; the accompanying illustration makes the construction plain, and also shows the large bearing area which gives the hinge long life and prevents the common and annoying sagging that occurs in car doors after considerable use. When the door is closed the plates in the hinge lock together and prevent rattling as well as holding the door firmly and closely in its place and so preserving the smooth outward appearance of the body. The plates which serve as foundations for the hinge are so formed that water cannot work past them and into the wood to cause decay; the removal of two screws from each hinge permits its removal from the car without disturbing the main fastenings. The Soss hinge is adapted to both straight and curved construction.

Albany Dealers Hold Third Show.

For the first time in two years the good people of Albany are enjoying a motor car show—the third effort of the Albany Automobile Dealers' Association—the inability on the part of the association to procure the First Regiment Armory, which houses the present show, and lack of another building of sufficient size to do the show justice having prevented the holding of an exhibit last year. And indeed a building of no mean proportions is needed to house the present show, for all told there are 59 different makes of vehicles on the floor—18 of which are commercials—shown by some 45 dealers; accessories are displayed by 20 dealers.

The decorations are very simple; they comprise alternate strips of orange and white bunting disposed with several flower entwined lattice work structures to form a canopy which covers the entire floor space in the drill hall. By way of rendering the exhibits of all the dealers accessible railings are not permitted; triangular hanging signs also done in orange and white announce the exhibits. The show, which was inaugurated on Saturday evening last, February 15th, will continue throughout the week and be brought to a close on the night of Washington's birthday, February 22d. The pleasure cars on exhibit are: Knox, Reo, Ford, Premier, Abbott-Detroit, Marion, Nyberg, Packard, Franklin, Henderson, R. C. H., Metz, Moyer, Stutz, Apperson, Paige, National, Kissel, Lozier, Oldsmobile, Oakland, Krit, Hudson, Flanders, Stearns, Buffalo electric, S. G. V., Rauch & Lang electric, Speedwell, Pierce-Arrow, Locomobile, Cole, Fiat, Cadillac, Haynes, Studebaker, Warren, Imperial, Pullman, Michigan.

The trucks shown are: Stewart, Selden, Alco, Knox, Reo, Adams, Packard, Mack, Saurer, Hewitt, Federal, Lippard-Stewart, Kissel.

Convenient Storage of Side Curtains.

Better than storing side curtains away in the compartment under the rear seat, where they are liable to be covered with all of the paraphernalia incidental to each trip, with obvious creasing and cracking of the material and breaking and scratching of the celluloid lights, is the method of storing them in a sheet metal tube made for the purpose. Such a tube, 29½ inches in length, and 6 inches in diameter, formed of No. 24 iron and provided with a partition 7 inches from one end, will serve to protect the curtains and also a pair of inner tubes; the tubes naturally are carefully rolled up and placed in the 7-inch compartment. Covers for both ends should be provided for the exclusion of dust and moisture.

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LIGHTING AND STARTING EQUIPMENT EXPLAINED

Where to Look for Trouble and How to Remedy It When It Is Discovered —The Adjustment of Brush Spring Tension Made Plain—Autoliter System as an Example of the Several Degrees of Accessibility.

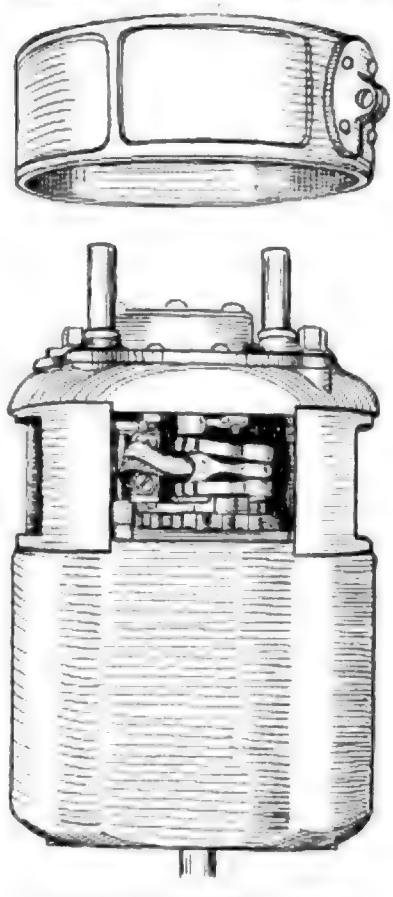
(This is the nineteenth of a series of articles designed to make clear the electric lighting and engine starting systems in use and to render easier their care and repair by the dealer and owner alike.)

Your lights go out with unexpected suddenness. Your starter refuses to exemplify that power which it always has been your pride to exhibit in the presence of admiring friends. You fuss and fume and go over battery connections and switches and meters and wiring all to no purpose. Finally, in desperation, you "take a look at the generator, anyway," and even if you have looked at it before, when it was running properly and needed no attention, you are surprised at the accessibility of the vitals—the wiring connections and the brushes and commutator. Nine times out of the proverbial ten, you will find the trouble right there—a loose wire, perhaps, or a broken "pigtail," or brushes that are too short properly to reach the commutator, or, as more often is the case, nothing more serious than a dirty commutator.

Making Repair Work Easy

All of which serves to emphasize that there are degrees of accessibility in generators and starting motors just as there are degrees of accessibility in every other part of an engine or chassis. That is to say, the valves of an engine invariably are easy to get at; no special tools are required in the majority of cases to bring them out of their state of retirement into the light. Which is logical, of course, for it is expected that the valves will require to be ground from time to time. If the operation were hard and required special knowledge it is altogether likely that the manufacturer of the engine would make the valves a little harder to get at in order to discourage indiscriminate tinkering with its possibility of damage. It is the same way with the differential. It is comparatively easy to remove the hand plate that closes it in and certainly it is no harder to re-pack the housing with grease. But it is a very much harder job for the amateur to remove the pinions, though, by reason of the foresight of the maker, it is comparatively simple for the experienced repairman.

So it is with the modern electric lighting and engine starting system; to the casual observer it appears to be bottled up tight—no chance of getting into its "internal economy" and less chance to make repairs. Actually, such is not the case; it is possible to get into any system on the market to the extent that is required in making adjustment or giving the care that they all demand—provided one knows how to go about it. The parts that cannot go wrong in a natural lifetime—the windings on the field and the armature—are securely sealed in the



AUTOLITER STARTING MOTOR

majority of cases, for the average person can do no good whatsoever in attempting to correct derangement in these parts should it occur through extraordinary accident; the repair of such parts requires the attention of a real expert, which means, briefly, the manufacturer. Hence, the manufacturer has taken the law into his own hands, so to speak, and has made the wiring hard to get at, secure in the knowledge that none but he can repair it in the event of trouble and equally as secure that the occasion for repair will be scarcely more frequent than a snow storm in the month of May. As a matter of fact, at least one manufacturer of electric lighting and engine starting equipment has made it absolutely impossible to get into the works of his machines—other than the brushes and the commutator, of course—without the use of special tools, and he does not supply the tools with the equipment.

Blood Vessels May Be Ruptured.

To the manufacturer, however, the extraction of the winding on the field, and its replacement with new winding offering no obstruction to the passage of current is a comparatively simple operation, and, be it added, a comparatively cheap one for the owner. It might not be so cheap for the owner if it were possible for him first to meddle with it; he might do more damage than already existed, or, on the other hand, he might do damage where none existed and the trouble was merely one of maladjustment of some part. From which appears the wisdom of the manufacturer and the precautions he has taken to ensure to the owner the best kind of service. Almost any one can doctor an ordinary cold in the head, but no one would think of attempting a major surgical operation; he would call in a specialist. And for the time being, the ordinary troubles which manifest themselves with electric lighting and engine starting systems can be likened to colds; 'most any one can doctor them quite successfully with the aid of the physics that have been recommended in the preceding eighteen articles on the same subject which have appeared in Motor World. Following the analogy, the repair of the more complicated parts of the systems, such as the wiring, must be likened to a serious operation which requires the service of a specialist—the amateur is likely to rupture a blood vessel and cause the thing to bleed to death, which means to short-circuit it and "kill" the battery.

Aiding the Amateur's Efforts.

On the other hand, the manufacturers of such systems have, as a rule, been at particular pains to make those parts which are susceptible of successful treatment by the amateur particularly accessible and simple. In the majority of cases, the owner or the

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dealer does not even require to know how to get at the parts; the modus operandi is perfectly apparent. The removal of a small metal plate, spring held in place; the lifting of a little "trap door"; the unlatching of an encircling band; nothing more is necessary, and in few cases is any tool as complicated as a screwdriver necessary to expose the brushes and the commutator, which are the parts that really require periodic inspection and care. Trouble may never occur, and then, again, it may, and when it does it generally can be traced to one or the other of these parts. Accordingly, the owner and the dealer have real cause to rejoice that the manufacturer has made these parts as simply accessible as he has made them; it is a mutual advantage.

Starter that Stands on End.

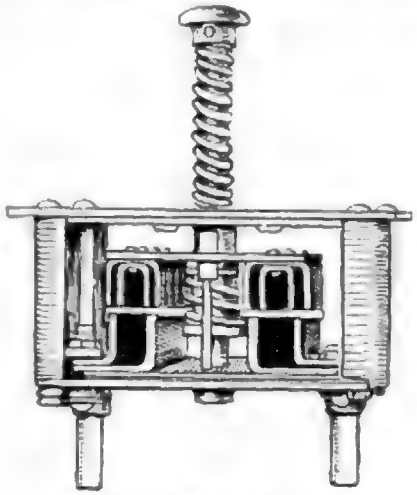
Carrying this same accessibility idea just a little further than is usual, the Electric Auto-Lite Co., of Toledo, Ohio, has evolved an engine starting motor and a method of mounting it that not only leaves little to be desired as far as the "getatability" of the brushes and commutator is concerned, but places these parts in a position where they cannot well be overlooked. Hence, their inspection—and probably their care, for one follows the other as naturally as a chaser follows a drink—is ensured, for the very conspicuousness of the device tends to invite attention. The starting motor stands up on its end, so to speak; it is not in a reclining position, as is every other starter on the market.

Obviously, the starter forms part of a complete electric system, the generating portion of which was illustrated and described in Motor World under date of November 14th in an article in which the care and repair of the generator also were outlined in a comprehensive manner. The generator itself is a compact, light-weight machine of the permanent magnet type in which current regulation is effected with the aid of a friction speed governor, which maintains the speed of the armature practically constant over a wide range of engine speeds.

Passage of current to the battery automatically is controlled by an electro-mechanical circuit breaker of the orthodox pattern contained in a housing within the arch of the magnets, where it is fully protected from accidental injury and the insidious action of road dust and dirt or moisture.

The brushes of the commutator also are fully housed, though, as is the case with the starting motor, they are quite easy to get at for cleaning, etc. The generator is the same as is used for the plain lighting system, except that its output has been increased slightly to compensate for the added drain of the starter on the battery. Consequently, there are but two parts in the combined system that have not already been covered, viz., the starting motor itself and the switch which controls it.

Of these two, the switch, of course, is the simpler, though it has no more moving parts than has the motor—each has but a single moving part. Similarly, both are completely enclosed, though neither is more difficult to get at than the other. In common with other devices of the same general kind, constructed to perform the same function, the switch is designed to be mounted beneath the floorboards with nothing visible



AUTOLITER BATTERY SWITCH

but the plunger; the whole mechanism is shown herewith in section, the better to make plain its construction. Briefly, the plunger carries a double row of inverted U-shaped contacts, and when depressed as in starting these contacts slip over others, thus making the connection between the battery and the starting motor.

Cleaning the Starting Switch.

As sliding contact is provided by the movement of the plunger, the device is made self-cleaning insofar as the actual contacts are concerned. Hence, small accumulations of dust and dirt, or even a small amount of oil can have no appreciable insulating effect. But, though the switch is carefully enclosed to keep out just such trouble-breeding foreign matter, a certain amount of dust will in all probability find its way in after continued use, and the paraphrased proverb, "Cleanliness is next to efficiency," should be remembered. Which is to say, a soft, long-bristled brush carefully wielded, is one very good way of ensuring against possible troubles, manifest in short circuits or the passage of insufficient current due to the insulating effect of dirt or other foreign matter. Incidentally, the presence of dirt results in more rapid wear than ordinarily would take place, because of the abrasive action of the particles.

Pursuant to previous instruction regarding the necessity for closing starting switches quickly, it is equally as important that they be opened quickly. Unless switches are closed quickly, the full strength of the battery is carried for a time by but a small portion of the total contact area, with the result that an excessive strain is placed upon it and fusing of the metal might take place. Hence, it is essential that the switch be closed with a quick, firm motion. In opening the switch, the button should be released quickly for substantially the same reason. When the switch is opened slowly, arcing at the break of the contacts, with consequent burning, is likely to follow. With the Autoliter switch, however, the latter trouble is impossible, for the reason that the device is of the "quick break" type in which the opening is controlled by a fairly strong spring, making it impossible to open the switch slowly.

To the owner or the dealer, the starting motor need be no more complicated than the switch, regardless of the multiplicity of its parts and its seeming complexity. There is only one moving part—the armature—and there are only two parts which need ever be touched from one season's end to the next; they are the brushes and the commutator. Both are easily accessible by removing the name-plate band, which is held in place by means of a single screw and nut.

Lubricating the Armature Bearings.

Electrically, the motor is of the plain series wound type and mounts a drum-wound armature carried in liberal sized ball bearings. The frame is continuous and solid and carries the field windings, which are fully protected both from accidental injury and dirt, the whole assembly being practically dirt- and water-proof when the name-plate band is in place. As may be seen by the accompanying sketch of the brushes and the brush-holding mechanism, the machine is of the four-pole type, thus ensuring a high torque moment at very low rotational speeds, a factor which is well-nigh indispensable for work for which it is intended. It is a natural characteristic of the motor, of course, that its torque increases with the load up to certain limits.

As the armature is mounted in ball bearings, its wants in the matter of lubrication will be exceedingly moderate, both for this reason and for the reason that it is in motion but a few moments at a time and at comparatively long intervals. A few drops of fine machine oil about once every 1,000 miles should suffice, unless the starter is used a great deal, when the frequency of the applications, but not the quantity of oil

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applied, should be increased. As so many times has been pointed out, too great a quantity of oil will serve no other purpose than to gum the commutator and dirty the brushes.

As the illustration of the brush-holding mechanism shows, the brushes are held in place by spring-impelled arms and are equipped with "pig-tails"; there are two points in connection with the construction which should not be overlooked in caring for the system. The first of them is to make certain that the tension of the brush springs is not altered through accident or design, and the second is to make sure that the "pig-tails" do not become detached from the brushes.

Adjusting the Brush Spring Tension.

In the majority of cases, the brush spring tension is set very carefully at the factory with the aid of apparatus designed for the purpose, from which the importance of preserving the setting may be appreciated. If the tension is increased, there is danger that the brushes will cut into the commutator and cause expensive damage which may require the commutator to be re-turned in a lathe. If, on the other hand, the tension is decreased, poor commutation will result, sparking will take place, and the commutator may be partly fused in consequence.

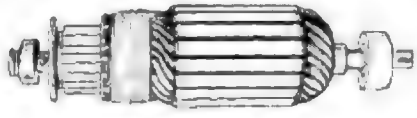
In either case, the symptoms suggest the remedy which best may be applied by testing the spring tension on a new machine with the aid of a small weighing scale such as is used for weighing material up to about 10 pounds in weight. The hook of the scale should be attached to the brush arm and the number of pounds registered on the scale the instant the arm lifts noted down for future reference. It is a comparatively simple matter to adjust the springs to correspond to the figure obtained, testing each with the scale. Needless to add, brushes that are too short will result in trouble of the same kind as that manifested by brush springs that are too weak. It is poor economy to attempt to run with brushes that are too short properly to reach the commutator, for new brushes cost but a few cents at the outside and can be inserted in not more than ten minutes by almost any one.

"Pig-Tails" that May Cause Trouble.

The accepted method of attaching "pig-tails" to metallic brushes is to solder them in place, in which case there is little chance of them working loose. With carbon brushes however, they generally are fastened by means of lugs and consequently there is some slight danger that vibration may loosen them. As their purpose is to ensure the proper distribution of current by eliminating the hazard of dirty or oily brush holders (which thus are relieved of the duty of carrying current), it is essential that their connections be intact. In previous articles, stress already has been laid upon the absolute necessity of tight electrical connections; there are few things that can cause more trouble of a mystifying nature than loose wires or loose connections.

How Excess Lubrication Hurts.

There are a number of reasons for the trouble that results from excessive lubrication. In the first place, too much oil, if per-

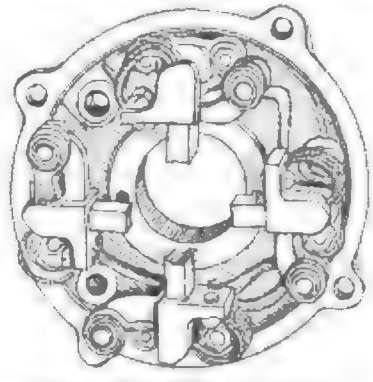


AUTOLITER ARMATURE.

mitted to remain, will result in one of two conditions: it will either partially dry out, leaving the commutator in a sticky, gummy condition, which disease rapidly will spread to the brushes and brush holders, or, if frequently added to, the commutator will remain always wet, which is bad for the insulation and bad for the commutation. The sticky, gummy condition is bad for commutation, too.

Commutator Care Made Plain.

The first palliative for either condition, naturally, is to reduce the supply of lubricant, after which attention can be turned to cleaning away the grime. Unless the commutator has been in such a state for a long time, which is unlikely, for the trouble gen-



BRUSH HOLDERS IN DETAIL.

erally manifests itself early in a noticeable loss of power, the excess oil generally can be removed with a cloth wrapped around the finger and dampened with gasolene and held against the commutator with the armature rotating. Then, if the commutator exhibits a clean surface unmarred by scratches, the brushes may be cleaned and re-assembled after a very minute quantity of fine vaseline has been applied to the commutator with the aid of a small piece of felt, or the finger tip.

Generally, however, the use of too much oil results in abrasures of the surface of the commutator due to the burning of the oil as a consequence of sparking, and in such cases more drastic treatment will be necessary, though it scarcely is more difficult of application. It consists, briefly, in applying No. 00 sandpaper to the commutator while the armature is rotating and continuing the application until all the scratches and burned marks disappear. To run the motor will necessitate that the brushes be left in place, of course, though they should be taken out and cleaned of particles of sand and copper from time to time during the refinishing process. Incidentally, as the motor is operated at practically no load, it will draw very little current from the battery, which knowledge should conduce to thoroughness in removing the last vestige of scratching. Needless to add, great care must be taken to apply the sandpaper evenly and not to cause "hills and dales" in the surface of the commutator. Of course, where the scratches are very deep and the commutator appears in a very bad condition, the application of sandpaper may serve no useful purpose, the only remedy being refinishing in a lathe. The job, however, scarcely is one for the amateur and had best be turned over to the manufacturer.

The peculiarly characteristic brownish, glazed appearance of the normal and healthy commutator never should be disturbed for any reason. If it becomes necessary through any cause to disassemble the machine, care must be taken to see that the glaze is preserved and that the brushes are replaced in exactly the same positions they occupied before the machine was taken apart.

Operation of Roller Clutch Pulley.

The Autolite starting motor is attached to the gasolene motor through its own train of gears, or through the intermediary of a "silent" chain operating through a roller clutch pulley, which obviates the necessity for disconnecting the gearing after the starter has performed its mission and the gasolene motor is operating under its own power. The roller clutch permits the electric motor to drive the gasolene motor, but instantly the latter picks up its own cycle of operations the driven member of the clutch overruns the driving member, releasing the clutch rollers and permitting free movement.

The battery employed in the Autolizer system is rated at 120 ampere hours capacity and is ample to "spin" a heavy motor at considerable speed for a length of time calculated to be sufficiently long to induce even the balkiest of carburetters to furnish mixture of the proper proportions to start the motor. The system operates at six volts.

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Stock Champion

National

International Champion

Five Models $2750 to $3400

LUXURY AND UTILITY



Electric Self Starter | **Center Control** | **Electric Lights** | **Left Side Drive**

THE NATIONAL car is the epitome of years work to combine luxury and everyday reliable service. Twelve years of concentration guarantees your noiseless, convenient National car.

Beneath the surface beauty is perfection in design and materials—dependability, stamina and flexible power that is indefatigable.

Long stroke motor (4⅞ x 6), left-side drive, center control, Gray & Davis electric starter, Gray & Davis dynamo electric lighting system, Bosch double dual magneto, multiple jet carburetor, 12-inch Turkish upholstery, tire pump integral part of motor, 128-inch wheelbase, Hoffecker speedometer, full floating rear axle, concealed baggage compartments, tire carriers, full heavy nickel trimmings, powerful brakes, perfect oiling system, robe rail, foot rest, foot mat in running board, concealed tool box, electric horn, top, curtains, Truffault-Hartford Shock Absorbers in rear, adjustable ventilating and rain vision windshield.

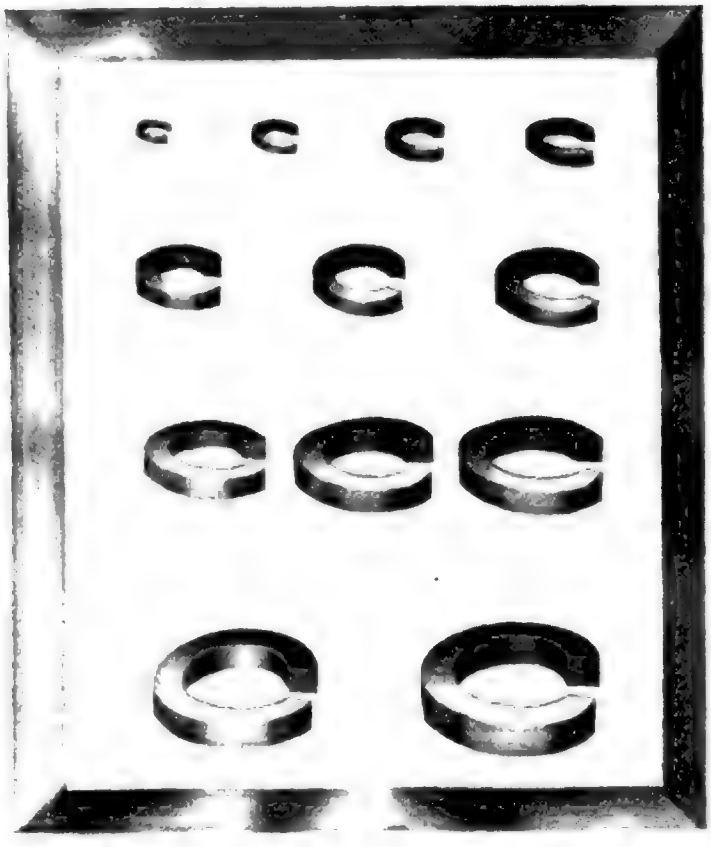
Book of Photographic Reproductions Sent Upon Request

NATIONAL MOTOR VEHICLE CO., Indianapolis, Ind.

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NATIONAL AUTOMOBILE LOCK WASHERS

A CAR IS AS STRONG AS ITS WEAKEST PART



Strong parts united by weak bonds are proportionately weakened. Broken lock washers are dangerous. Soft lock washers are ineffective.

NATIONAL LOCK WASHERS are conscientiously manufactured, and not just "turned out."

The millions in use place a sense of responsibility on our shoulders which we are proud to carry.

That's why we have never sacrificed quality.

THE NATIONAL LOCK WASHER CO.

Chicago, Ill. Newark, N. J.

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THE DIRTY CRANK

has made every motorist mad at some time or other, whether it was because "the darned thing wouldn't start," or because the handle was dirty and greasy.

Cut It Out!!

ELIMINATE THE CRANK

by having your 1913 car equipped with an Electric Cranker. Electric Lights also from same system, all founded upon and furnished energy by an

GLBA
STORAGE BATTERY

Use the Class A GLBA Battery with an Electric Lighting Generator
Use the Class B GLBA Battery with an Electric Self-Starter

Write us for full information

Willard Storage Battery Company

New York Branch—136 West 52d Street
Detroit Branch—1191 Woodward Avenue

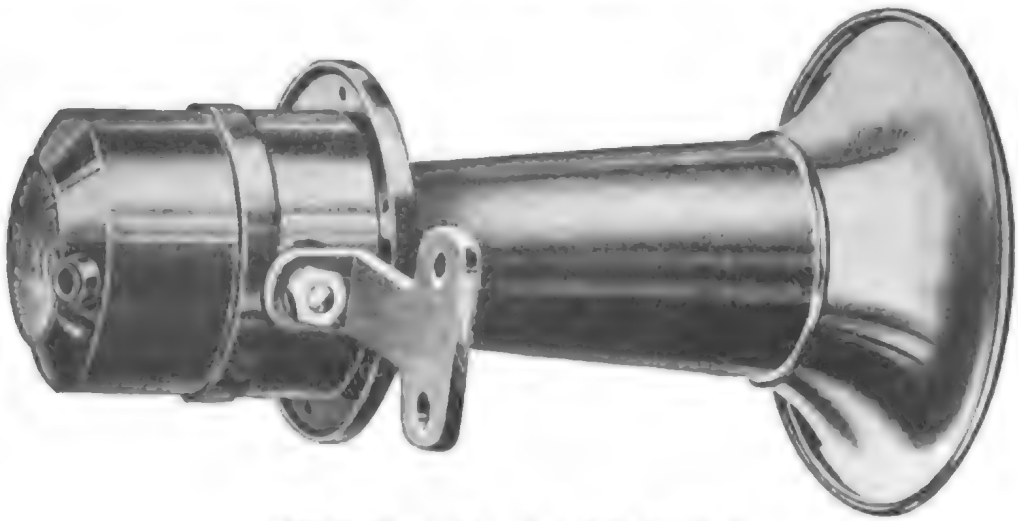
CLEVELAND, OHIO

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Depots in All Principal Cities in the United States, Canada and Mexico

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Elyria-Dean
TRADE MARK



REXO HORN
Electric Warning Signal
GUARANTEED

A Good Single-Tone Electric Horn With Unlimited Guarantee Cannot Be Made to Retail At Less Than $8.00

THE Rexo horn is a real electric warning signal guaranteed for life. It is made on modern electrical principles in use upon thousands of telephones throughout the world. The big point is that it is manufactured in its entirety by a company with years of experience in the manufacture of all kinds of electrical apparatus, including power boards, switch boards, police flash light systems, city telephone systems, and other constant service electrical devices.

On account of the reliability and low price of the Rexo electric warning signal, it is destined to be "standard equipment" upon most good cars of medium price for 1914. We have already sold over 65,000 Rexo horns for 1913 cars. 45,000 Rexo horns of special design are specified by one car maker—the largest electric horn order ever placed.

The Rexo horn comes complete with push button and cord. It is designed to operate from any 6-volt battery. The Rexo does not contain any moving parts to require tri-weekly lubrication, monthly overhaul, washing in gasoline, greasing, etc. There is no danger from dust or moisture.

The operation is positive, winter or summer, as there is no oil to congeal.

The sound of the Rexo is loud, abrupt, clear and instantly responsive—unlike the motor-driven horn.

The standard Rexo for outside mounting is finished in black enamel with polished nickel bell, or black enamel with polished brass bell. We also make a special "under the hood" horn.

For those who desire a complete warning system on their cars, the Tuto two-tone horn offers the highest grade and finest electric warning signal ever devised.

Elyria-Dean Products Manufactured Only By

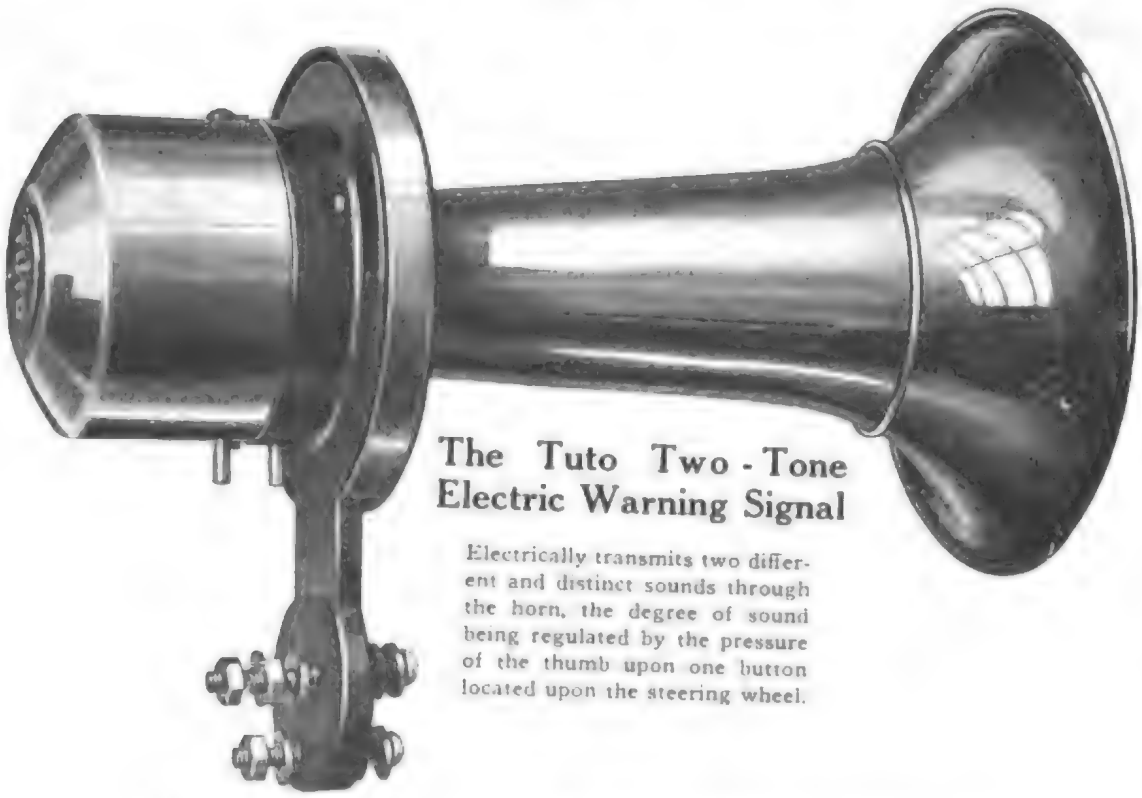
THE DEAN ELECTRIC COMPANY

Kansas City, Mo. 501 Olive Street, Elyria, Ohio San Francisco, Cal.

"Look for Elyria-Dean Where Quality's Seen"

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Elyria-Dean
TRADE MARK



The Tuto Two-Tone Electric Warning Signal

Electrically transmits two different and distinct sounds through the horn, the degree of sound being regulated by the pressure of the thumb upon one button located upon the steering wheel.

A Complete Signalling System For All Driving—In One Device

THE Tuto Horn is a **complete** warning **system.** It **electrically** transmits two different and distinct sounds through a horn projector. **One** button located upon the steering wheel produces a **service** warning and an **emergency** signal—the sound being regulated by the degree of pressure on the button.

This is the **only** warning signal ever devised to give the motorist a complete warning system in **one** horn. Before the Tuto two-tone electric warning signal was introduced, careful motorists found it necessary to equip their cars with two different horns—one for touring—the other a bulb horn for city driving. This has proven both expensive and inconvenient.

Besides, the **habitual** use of the bulb horn for ordinary driving has been the cause of accident upon accident, as it did not make itself heard. Often it was too late for the driver to change position from the bulb horn to the emergency signal, because both hands and feet were needed to operate the steering wheel, clutch, brake and gears.

The Tuto electric warning signal is not a motor-driven horn. It is made upon modern electrical principles in everyday use upon thousands of telephones. There is nothing to get out of order. It is **instantly** responsive—a very important point in its favor and a feature not possible with the motor-driven horn.

It is made to operate upon any 6-volt storage battery or five ordinary dry-cell batteries. Neat metal conduits for enclosing the cord where it passes up the steering column preserves the neatness and beauty of the car.

We manufacture ELYRIA-DEAN Ignition Systems, Speedometers and electric starting and lighting systems.

Elyria-Dean Products Manufactured Only By

THE DEAN ELECTRIC COMPANY

Kansas City, Mo. **501 Olive Street, Elyria, Ohio** **San Francisco, Cal.**

"Look for Elyria-Dean Where Quality's Seen"

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Not Coming



Not radical, freaky departures from so-called established design, but proved by every test superior to wooden wheels in strength, lightness and resiliency, giving an overplus in tire saving too big to be ignored or overlooked—

Explaining why they are standard equipment on many of America's leading cars.

You have got to form your own estimate through your confidence in the judgment of car manufacturers who have grasped and adopted the wire wheel idea as a big quality addition to their outputs.

Aside from their unusual ability to stand up under side swipes and unusual radial shocks, the point you, as a dealer, want to emphasize is the tire economy made positive and practical by McCue Wire Wheels.

It is the biggest selling argument ever hung on to any car, because it reduces cost of upkeep. You know how this reduction appeals to the buyer.

McCue Wire Wheels hold tire—road pound—deterioration to a minimum, for the very simple reason that they carry their maximum weight at the hub—the minimum at the rim.

We have used the following illustration before. It is good enough to reprint.

You can strike a destructive blow with a ten pound hammer if you grasp it by the handle. Reverse the operation by holding the head and striking with the handle, and the result is harmless.

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But Here



The hub of the McCue Wire Wheel is the "hammer head," the rim is the "handle"—and we hold to this form of construction so rigidly that we do not use the demountable rim for the simple reason that it adds weight when and where it should not be added.

Here is our message to dealers:

You specify wire wheels on the cars you sell—now. Don't wait for competition to take this step; but entrench yourself now back of this wonderful improvement.

Ⓢ Standard Company Spokes Ⓢ

McCue Wire Wheels are built with Ⓢ spokes, products of the Standard Company of Torrington, Conn.

Ⓢ spokes are made from wire of the same standard set by the Coventry (England) Swaging concern.

It is superior to all other spoke material in tensional and torsional strength, combining these with extreme bending quality. Special drawn carbon steel is used in the construction of Ⓢ spokes.

THE McCUE COMPANY, Buffalo, N. Y.

CUBIT
ELECTRIC HORN

HIGH TONED - MUSICAL BLAST
SMALL CURRENT CONSUMER
WEIGHS 2½ POUNDS
BLACK ENAMEL - HIGH GLOSS
HIGH GRADE - LOW PRICE



$3.75 COMPLETE

To All Dealers

Who Have Not Yet Taken Up This Cubit Horn Proposition—Read the Tersely Told Story Above This and the Succeeding Page.

The description spells **quality** all the way through, and it ought to convince you that you can sell a real electric signal at a modest price.

Hearing Is Believing

You will wonder how we do it after you hear the signal. Your customers will move it off your shelves the instant **they** hear it.

We are still in a position to make prompt deliveries, but you, Mr. Dealer, will do well to get your order in **today.**

THE MOST POWERFUL DURABLE AND EASILY SOLD SIGNAL ON THE MARKET

DEALERS' LIBERAL COMMISSION

CUBIT
ELECTRIC HORN



$3.75 COMPLETE

Territory Closing Rapidly

For the Most Surprisingly Successful Seller Ever Put Out in the Automobile Field.

Here is a signal, Mr. Dealer that will get right into the heart and the pocketbook of every man in your territory who is still "honk-honking" with the old-fashioned bulb arrangement.

Sales Are Now Running Into Hundreds of Thousands

and that ought to be proof conclusive that **you** need the CUBIT HORN in your business. It is clearly up to you to **act** now and make the quick sales and big profits that are coming to CUBIT HORN dealers all over the country.

Send for full description and our terms to you. Address all communications to

Nonpareil Horn Manufacturing Co.

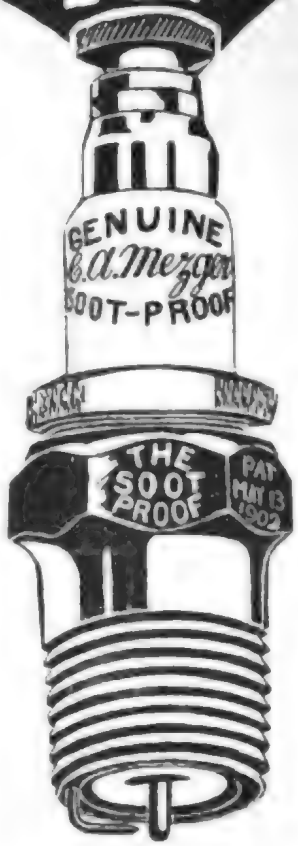
73-75 Wooster Street, New York

Factory: 299 Ocean Avenue, Jersey City, N. J.

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We Are Creating More Demand For

We Want to Get Into Communication With Dealers Who Know That the Service They Render to Their Customers Is Bound to Bring Big Returns in the Holding and Making of Trade.



To such dealers, we are prepared to submit a spark plug proposition that is as faultless as the plug itself—one, which, in addition to yielding a liberal commission, will keep car owners satisfied and in a good humor.

Made by One of the Oldest Spark Plug Makers in America.

Are You in Shape to Meet it?



Mezger Soot Proof Spark Plugs, made by one of the oldest plug makers in America, guarantee their users against short circuit or leakage. They cannot break down or they cannot go wrong.



These plugs, when installed, do their work year in and year out, even practically eliminating the necessity for cleaning through burning up their own soot.

We want every dealer to know that we are telling this story in detail to a good many hundred thousand intelligent car owners—this, through a most covering campaign involving the leading automobile publications of America. These, in the aggregate, reach practically every car owner in your vicinity.

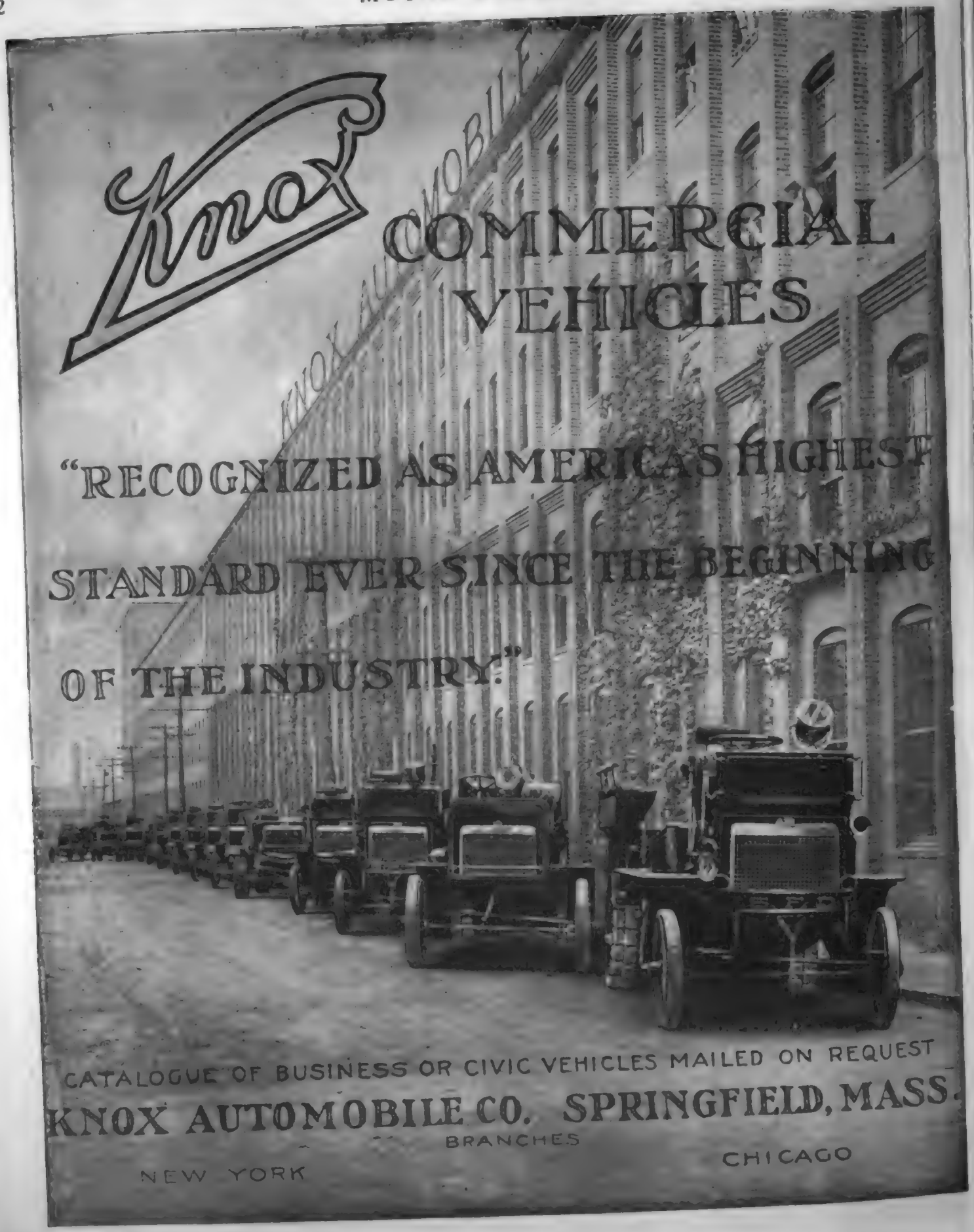
We want to help you to sell Mezger Soot Proof Spark Plugs. We are taking this method to do it for we believe that a plug of recognized merit should be brought to the attention of the car owning public through the use of printer's ink rather than through word of mouth "across counter."

Write and get our interesting proposition. Let us send you literature telling in plain words how Mezger Soot Proof Spark Plugs are permanently good and permanently "troubleless."

We are creating the demand—you be prepared to meet it.

C. A. MEZGER, Inc., 15 Canal Place, New York

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Knox
KNOX AUTOMOBILE
COMMERCIAL VEHICLES
"RECOGNIZED AS AMERICAS HIGHEST STANDARD EVER SINCE THE BEGINNING OF THE INDUSTRY."
CATALOGUE OF BUSINESS OR CIVIC VEHICLES MAILED ON REQUEST
KNOX AUTOMOBILE CO. SPRINGFIELD, MASS.
BRANCHES
NEW YORK
CHICAGO

SPRINGFIELD
CONVERTIBLE BODIES

Springfield Convertible Bodies are the embodiment of refinement in the matter of lines, material, finish and ease of adjustment.

The runabout convertible body shown here illustrates one extreme of a line that goes on up to the highest grade limousine, landaulet and town car.

Even this faithful reproduction cannot approximate the beauty and convenience of the equipments as they actually appear. They must be seen to be fully appreciated.

The ease of operation is remarkable; the tops are rapidly raised into position, the doors are opened, the hinged glass swung up into position, the remaining windows are removed from a box in the back of the front seat and buttoned into position, completely enclosing the car in less time than an ordinary top can be erected and the curtains adjusted.

Write for brochure of reproduced photographs.

SPRINGFIELD METAL BODY CO.
Springfield, Mass.



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Advertising that is 100% Efficient-

HOFFECKER SPEEDOMETERS



Write to your car manufacturer tell him to equip the cars you sell with Hoffecker Speedometers and Waltham Time Pieces then you are selling another important item of service.

Hoffecker is to a speedometer what Waltham is to a timepiece both names stand for quality of product known and used wherever cars are found.

Hoffecker is to a Speedometer What Waltham is to a Timepiece

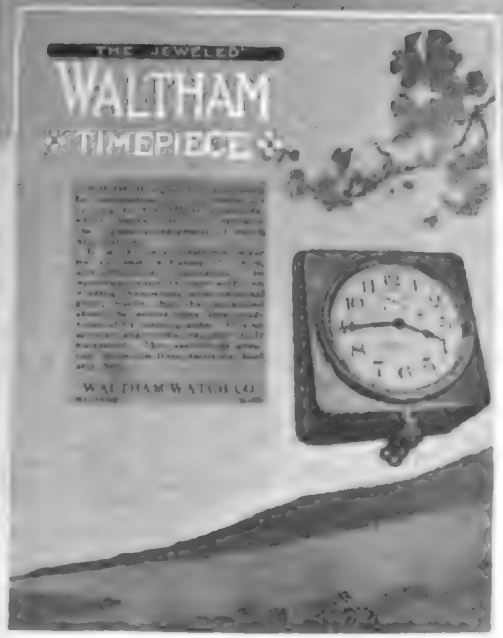
You cannot find better instruments anywhere at any price and the fact that we can sell this combination to manufacturers at moderate cost emphasizes this argument.



We subordinate selling cost (which is overhead) to cost of production. and to do this we concentrate our advertising in a group of publications that reach prospective car owners and owners only. A sample two-page spread of this advertising is shown here.

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What it means to you and your Trade



WALTHAM TIME PIECES

You can judge Hoffecker-Waltham worth by cost of production. These instruments are turned out in factories where design, material and workmanship are paid for on a scale commensurate with our ideals—and they are high.

Hoffecker is to a Speedometer What Waltham is to a Timepiece

You, as a dealer, get the benefit of this advertising it reaches the people to whom you sell cars and accessories.

The car manufacturer gets the money we save (through economical, effective advertising) in the shape of the highest grade instruments at prices he can well afford to pay.



Again we say:

If you want to help your prospective car owner to exceptional speed and time recording service, then specify Hoffecker Speedometers and Waltham Time Pieces.



ONE LOOK locates the trouble

Lift the hood and look. A single glance, bright day or darkest night, tells the whole story of what's wrong with your ignition when your motor is equipped with J-D Visible Gap Spark Plugs. Hunting around with matches, short circuiting with a screw driver, unscrewing the plugs to examine the points—all that fuss and loss of time are needless.

J-D Visible Gap Spark Plugs

See how simple the secret of their efficiency is. In the porcelain—outside the motor—is an opening or port. In the portion of the central electrode and facing this port is an adjustable gap, regulated by knurled nut at the cap so that it can be widened or closed entirely. Through this port you see if the spark is jumping the gap in the electrode. If there is no spark at the gap you know the trouble lies behind in wiring, magneto, coil or batteries. If the spark jumps, but proper ignition fails to follow, then the points must be fouled or carburetion is faulty. By widening the gap you can increase intensity of spark and scour the points clean through the J-D patented electrical action found in no other plug.

There are other services this plug can render. It facilitates timing of engine, regulates spark for any cylinder and uses minimum current.

Yet the Price Is Only $1.00

If your dealer cannot supply you, we will mail as many as you want prepaid on receipt of price. Our guarantee, "Your money back or a new plug unless you are absolutely satisfied," goes with every plug.
A new edition of our classic "Ignition and Spark Plug Talk" is just off the press. Write for a free copy.

Jeffery-DeWitt Company
Detroit, Michigan
565 Butler Avenue

Largest Manufacturers of Spark Plugs in the World

WHEN ORDERING BY MAIL, BE SURE TO GIVE THE SIZE WANTED OR MAKE OF MOTOR.

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TIMKEN
AXLES & BEARINGS



Look Beneath the Motor Truck

WATCH the axles of the giant motor truck as it rumbles by, over the rough roadway.

It swerves about other vehicles, bumps across car-tracks, jolts over cobblestones. The great load bears with grinding force first to one side, then to the other.

Truck tires are solid, truck loads are heavy. Engine and transmission are attached solidly to the frame and ride smoothly on the powerful springs, but the axles and their bearings get every bit of the tremendous pound and vibration.

A five-ton truck itself weighs about 8,000 lbs., its load 10,000 more. The whole of this immense weight is supported by the spindles of the front and rear axles.

In Timken-Detroit Axles (sizes for 5-ton work) the front spindles are 2½ inches, the rear spindles 3¾ inches, in diameter. And Timken-Detroit are the strongest axles made.

Regard for a proper factor of safety decrees that the spindles shall not be smaller or lighter. Years of actual service show that they need not be heavier.

Think how good the steel must be, how carefully selected, machined, heat-treated and ground to carry that 18,000 lbs.!

Only long years of experience and the concentration of an entire great organization on axle-building can develop the knowledge of how to make axle spindles that are good enough for heavy commercial-car service.

The 18,000 lbs. rest, too, on the bearings that cover the axle spindles—two bearings on each spindle, eight in all. And in a Timken-Detroit Axle these are Timken Tapered Roller Bearings, that carry the load along their whole length, not on mere points as ball bearings must.

So the 18,000 lbs. rest really on the rollers, and not on all of them either, because only one-fifth of those rollers are under the load at any one time. Actually 18,000 lbs. on 21 rollers—an average 240 lbs. to the roller—twice that on some—and the rollers average ⅝ of an inch in diameter.

And mere weight isn't all—isn't even half. Hammer blows due to jolting over rough roads, and side pressure when corners are turned often reveal weights! The bearings are constantly meeting all of them at once!

Yet even this is not all! It is only what the [illegible] What about emergencies? Careless driving, overloading, the hundred and one *extraordinary* stresses that the truck must meet, and meet every day.

You can't count on your driver as you could on yourself. You can't be sure he won't travel at excessive speed, take chances, cut corners, back too hard against the curb.

Axles and bearings have to meet these *emergency* requirements. They are inevitable in motor-truck service. They must be anticipated in truck axle and bearing design.

That's why, with succeeding years, there has been steady development in truck axles toward the Timken ideal of surplus strength for emergencies.

From long experience, minutely tabulated, Timken engineers have discovered the points in axles where extra strength is required.

And Timken engineers are backed by two great Timken production organizations that live up to their exacting specifications. Organizations of men whose whole hearts are in the work of building the best possible axles and bearings for use in motor trucks and pleasure cars.

Look then beneath the loaded truck as it goes about the streets, watch the axles at work, think of the bearings hidden in the hubs, and you will gain a new appreciation of the intricate problem of good truck axle and bearing construction.

Get the whole interesting story of axles and bearings by writing to either address below for the Timken Primers, T-3 "On the Care and Character of Bearings," and T-4 "On the Anatomy of Automobile Axles."

THE TIMKEN-DETROIT AXLE CO., DETROIT, MICH.
THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

Abbott-Detroit

THE ONE PERFECT CAR

THOSE who are attending the Shows for the purpose of making an unprejudiced study of motor car values, unanimously declare that all honors go to the Abbott-Detroit.

The Abbott-Detroit maintains its position as leader of motordom. It is the incomparable and unapproachable car. Persons already intimately acquainted with this superb line go away with even greater appreciation of its superior value than before. Every owner is fully convinced of the wisdom of his choice.

Some lines you have perhaps passed by with no more thought of buying or selling than were you a customer looking for all-wool goods and nothing but cotton were shown you. But when you approached the Abbott-Detroit booth you at once recognized the genuine article. You were unable to find any other car that offered such beauty, comfort and mechanical perfection at anything near the price and nothing in all-around qualities that could excel at any price.

We cannot put the truth too strongly. We are dealing in cold, hard facts. The Abbott-Detroit is the maximum car. Ask any Abbott-Detroit owner what he thinks of his car. Those who previously owned other cars are unanimous in their declaration that the car cannot be matched at any price. This is as true with those having owned $5000 and $6000 cars as those who paid much less. Unsolicited testimonials being received daily show that in scores of instances the 1912 model Abbott-Detroits have been driven from 10,000 to 20,000 miles through all sorts of weather and road conditions without a single cent being spent for repairs.

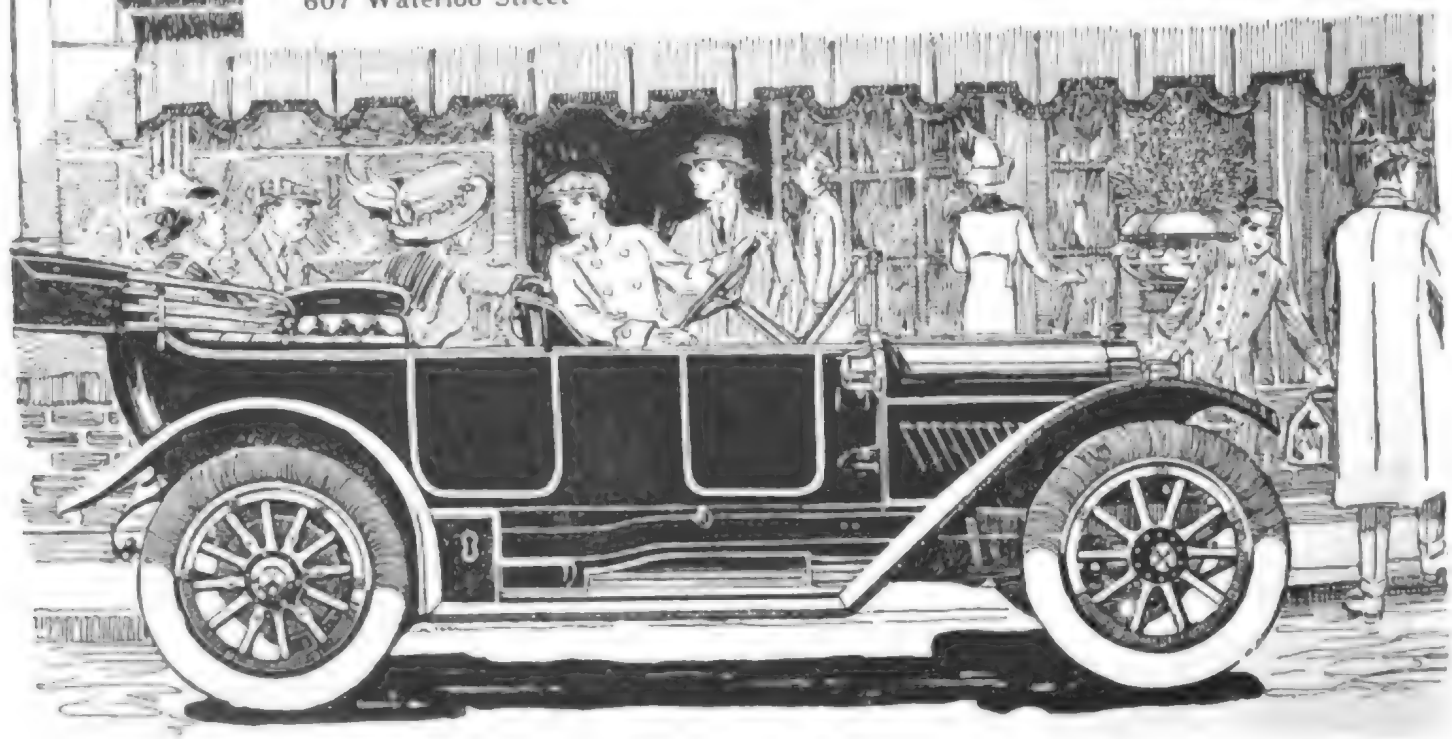
If as an owner you want a car that will give you the same consistent service year after year, you should buy an Abbott-Detroit. As a dealer you will hold your trade and insure future success by handling the only perfect and reliable car.

PRICES AND MODELS

34-40 3-pass., Roadster, 116-inch wheelbase	$1700	44-50 7-pass., Touring Car, 121-inch wheelbase	$2000
34-40 5-pass., Touring Car, 116-inch wheelbase	$1700	44-50 Battleship Roadster, 121-inch wheelbase	$2150
34-40 3-pass., Colonial Coupe, 116-inch wheelbase	$2000	44-50 7-pass., Limousine, 121-inch wheelbase	$3050
44-50 5-pass., Demi-Tonneau, 121-inch wheelbase	$1975	Top, Windshield and Speedometer $100 Extra	

ABBOTT MOTOR COMPANY

607 Waterloo Street DETROIT, MICHIGAN



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CAPACITY
GURNEY
ENDURANCE

Full complement of balls;
Solid one-piece separator;
Uninterrupted raceways;
Full depth of raceways to resist thrust.

These are the four essentials in ball bearing construction, found only in Gurney Ball Bearings which enable us to make the broad claim that no ball bearing on the market today has the capacity and endurance of the

GURNEY BALL BEARING

No ball bearing is better than its raceway. Gurney Ball Bearings excel because they are the only bearings possessing uniform raceways of the right contour.

No other ball bearing manufacturers can produce the perfect raceways that we produce, nor can they assemble, with as many balls, a complete bearing, with a single piece separator, as we do, without slotting the raceway.

Our right to claim the position of producers of the most efficient ball bearing on the market lies in the fact that the above statements are all true, and proveably so.

Nothing will please us more than an opportunity to demonstrate the truth of these facts to your entire satisfaction.

Gurney Ball Bearing Co.
Jamestown New York

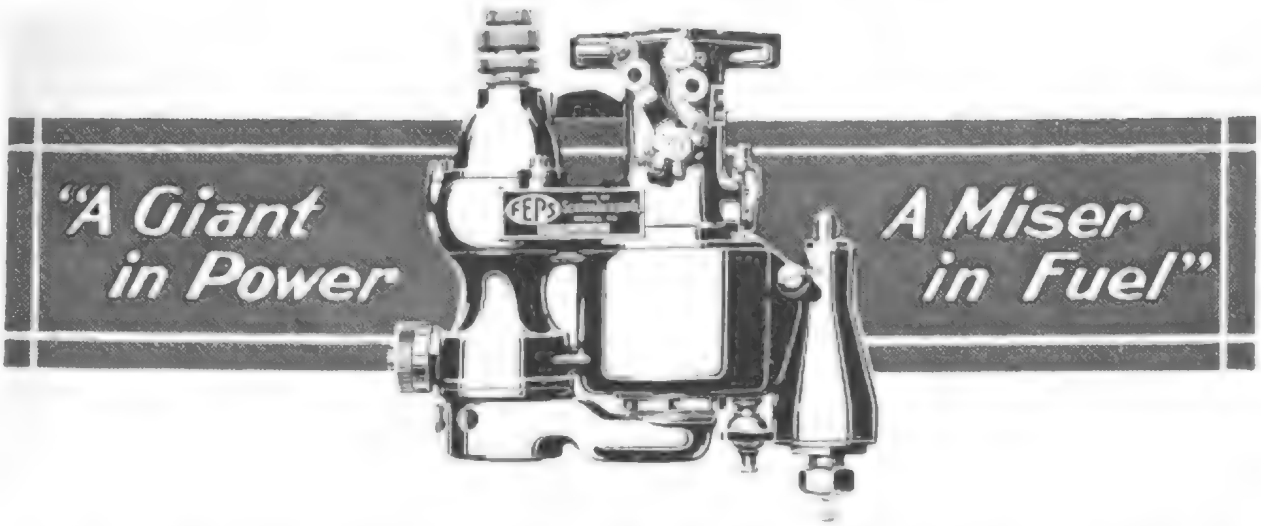


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SHELDON
STEEL
WHEELS
The Sheldon Steel Wheel performs a double function in truckdom. It positively eliminates the necessity of wheel replacement and it reduces tire wear to the minimum.
Destruction tests carried out in our factory showed conclusively that a pendulum blow which demolished a wooden wheel had little or no effect on the Sheldon Steel Wheel.
The Sheldon Steel Wheel is resilient. Its weight at the periphery is negligible. All frictional heat radiates quickly from the metal. These three points contain a message of vital importance to truck owners or manufacturers because they mean greater tire economy.
All the quality of design and workmanship that have made our springs and axles famous for their indestructibility will be found in this latest addition to the Sheldon line.
SHELDON AXLE CO.
WILKES-BARRE, PA.
CHICAGO BRANCH
DETROIT BRANCH

Every Reliable Accessory Dealer

should have our attractive proposition on



The FEPS CARBURETOR

You've heard so much about wonderful carburetors that you're probably case-hardened in skepticism. We submit, however, these two series of facts for your consideration.

FIRST. The Carburetor is today the most imperfect part of the automobile, and far behind, in efficiency, every other accessory. There's real need of a real carburetor.

SECOND. The Feps Carburetor splendidly meets that need. It involves an entirely new principle of auxiliary air supply, producing a marvelous increase in flexibility; an absolutely perfect mixture at all speeds, with an increase of 25% to 50% in miles per gallon of fuel on any car. It contains no springs, no balls, no cams, no reeds, and all adjustments once made are permanent. It gives a perfect mixture with any grade of gasoline and is unaffected by altitude, weather conditions or change of temperature. It also embodies a never-failing quick-starting device.

The first fact you cannot dispute, the second you probably will, until you test out the Feps at **our** risk. Get in line with the Feps now for increased business and profit.

FEPS CARBURETOR

Write at once for
Descriptive Illustrated Booklet

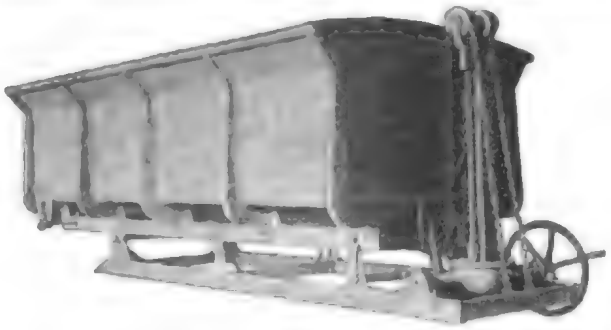
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Department "F"

Media, Pa.

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A Steel Truck Body That Is Worthy of Your Truck

The Budd All Steel Body represents the last word in the art of truck body building. It stands for security, strength, safety and sanitation. It insures your truck a body that is practically indestructable---a body that will stand up under the most severe wear and tear---giving the maximum of service---needing the minimum of repair. It will not rot or crack. It cannot split or warp. It eliminates fire risk entirely and by reason of its light weight is correspondingly easy on tires. In a word it represents truck body efficiency to the utmost degree.

BUDD All Steel BODIES

are made of patent, leveled, open-hearth steel. By use of special machinery and dies and an exclusive process of manufacturing, the bodies are fashioned into shape. The frame is strongly welded together and becomes practically a single unit.

The panels are either welded or hot riveted into place. The floor is corrugated and will withstand the roughest usage. Thus great strength, the main requisite of a truck body, is achieved. But not at the expense of lightness, for the strength of the Budd All Steel Body lies in its scientific construction—each pound of metal used being carefully apportioned and balanced.

All corners are made round. There is no place for the accumulation of dirt or germs, and as each body can be readily flushed with water without any danger of damage or absorption, perfect sanitation is possible.

The perfected welding process employed carefully conceals all joints and seams, thus the surface of the body is perfectly smooth. This, together with the fact that the enameled finish is "oven-baked" on at a higher temperature than is possible with wood, assures a finish that is not only extremely handsome but exceptionally long lasting as well. Yet with all these manifold advantages the Budd Body actually costs no more than a first-class body of wood.

Budd All Steel Bodies are furnished with priming coat only or completely enameled or lettered. They can be made in any style or design and of any capacity. Whether you manufacture commercial vehicles or simply contemplate purchasing a truck, it will pay you to investigate the Budd All Steel Body. We'll be pleased to furnish you estimates and any information you desire. Write us today.

Edward G. Budd Manufacturing Company

Ontario and I Streets Philadelphia, Pa.

Detroit Office and Showroom
796 Woodward Avenue

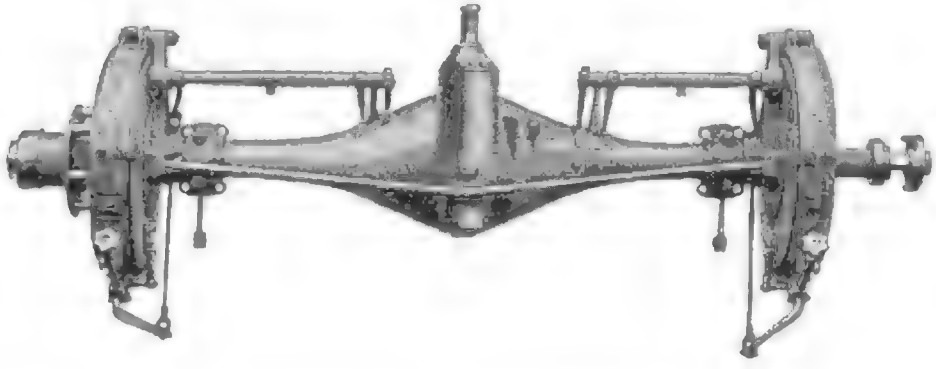
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American

American

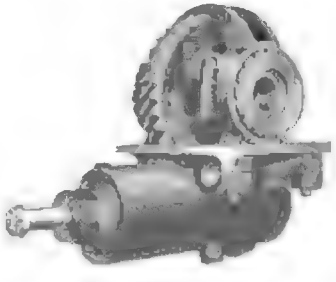
American Axles

Having Least Friction Give Most Power



Whether your motive power is electricity or gasoline, your problem is one of power transmission rather than power creation. *American Axles* least obstruct the flow of power from your motor to your wheels.

After an electric car leaves the garage, no further addition can be made to the charge which its batteries carry. *American Axles* because of their minimum of friction, perfect construction and highest quality workmanship, will give you the maximum mileage of which that charge is capable.



Our position in this industry allows us, we believe, to speak with authority to every prospective car owner on this important subject. We designed and built the first Bevel-Drive Axle used by an electric car in America. Today 80 per cent. of the electrics in this country use *American Axles*

Only in *American Axles* can you have the choice between the highest developed type of bevel gears and the famous Lanchester-Daimler Worm Drive.

We hold the exclusive American rights as axle manufacturers of the Lanchester-Daimler Worm Gearing, through the Warner Gear Co., of Muncie, Ind.

THE AMERICAN BALL-BEARING CO.

Edgewater Park & L. S. & M. S. Ry. CLEVELAND, OHIO

American

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Victory

For the Magnetic Speedometer

Scientific Approval

Below we publish the report of Henry S. Carhart, of Michigan University, one of the world's foremost scientists. In this paper he proves from start to finish the superiority of the magnetic speedometer. Read every word. It's interesting. Thus you see the scientific world approve and select the magnetic speedometer as the most practical and most accurate.

In addition to this over 98% of the automobile manufacturers have chosen the magnetic speedometer.

Over 95% of all the speedometers to be manufactured during 1913 will be built on the magnetic principle.

Over 400,000 cars for 1913 will be equipped with a magnetic speedometer.

What more need be said?

Professor Carhart submits his purely scientific and unbiased report as follows:

"The problem in designing a speedometer is to convert the continuous rotation of a flexible shaft into the one-way deflection of an indicating dial; in addition, this conversion must be effected in such a manner that the deflection at any instant shall be proportional to the speed with which the shaft rotates."

"It is clear that there can be no continuous mechanical gearing to effect the transfer; for while the shaft goes round and round, the dial turns against a retractile or biasing spring only until a balance depending upon the speed is established. The dial then remains stationary until the speed of the shaft changes."

The Magnetic vs. Centrifugal Type

"Two principles only are in use for the transfer of the motion of the shaft to the indicating dial: **centrifugal force** and **magnetic induction.** In the centrifugal instrument the rotating mass must change its position relative to the shaft in obedience to the centrifugal force acting upon it; this motion must be transmitted by complex mechanism to the indicating hand sweeping over the dial. The mechanism includes levers, springs, rings, and cams, and the transmission is **indirect** and **circuitous.**"

"In the magnetic type of instrument, the rotation of the magnet by the shaft induces electric currents in the disc or cylinder of the indicating member, and by a well known law the disk or cylinder is flexibly dragged around after the magnet. The disk or cylinder would rotate continuously with the shaft were it not held back by a biasing spring. This device may be described as a magnetic gearing or friction drive **directly** converting a rotation into a one-way defection by means of the withholding spring."

"There are several evident advantages in favor of the magnetic instrument:"

One Magnetic Advantage

"Its simplicity of design and construction. It contains only one rotating member, one deflection indicator, and one spring, as compared with the multiplicity of springs, levers, and cams of the centrifugal type. The various members of the

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Read Every Word of this Important Report

centrifugal system are held in contact by springs with sliding friction; hence the liability to change in tension with age and use, with a consequent derangement of the indications."

Another Magnetic Advantage

"The torque on the indicating member of the magnetic speedometer is strictly proportional to the speed. The rotations of the shaft are directly and immediately convertible into a deflection of the disk or cylinder with its indicating hand or scale. On the other hand it is a well known law that centrifugal force varies as the square of the speed of rotation. Further, the motion of the rotating mass in obedience to the centrifugal force acting on it increases the radius of rotation and thus further augments the acting centrifugal force above the square of the speed. Again, a resolution of this force into an effective and a non-effective component further complicates the transmission, so that an open scale of approximately equal parts is obtained only by the use of an irregular cam at the end of a series of springs and levers."

Still Another

"In permanency of calibration the magnetic speedometer is superior to the centrifugal. The experience of twenty-five years and of thousands of electricians with the Weston direct current ammeters and voltmeters shows without any question that permanent magnets, properly aged, retain their magnetic strength to a most remarkable degree. The degree in the accuracy of reading of electrical measuring instruments is much in excess of that needed in speedometers; and yet the magnets of the former are so permanent as to leave almost nothing to be desired."

"On the other hand, it is well known among engineers that "tachometers," which measure speed of rotation by direct application to the shaft of a machine, are not reliable to anything like the degree obtaining with electrical measuring instruments. Tachometers must be frequently checked to be at all dependable. They work on the centrifugal principle, and differ from speedometers only in certain details of arrangement. All mechanical engineers know that the centrifugal steam engine governor has long since been displaced by more sensitive and dependable devices."

The Most Important Advantage

"The simplicity of construction and the small number of parts and bearings in the magnetic speedometer justify the conclusion that its durability is superior to that of the other type. There is nothing to wear out in the indicating section of the magnetic instrument, and the shaft carrying the magnet suffers no more from use than the corresponding member of the centrifugal type. **Manufacturers' Note** (in fact, because of sixty per cent less speed, the advantage on this score must of necessity be with the magnetic type). The multiplicity of contacts and springs in the latter offer many more chances for wear and depreciation."

(Signed) **HENRY S. CARHART,**
Professor Emeritus of Physics,
University of Michigan.

Stewart-Warner Speedometer Corporation

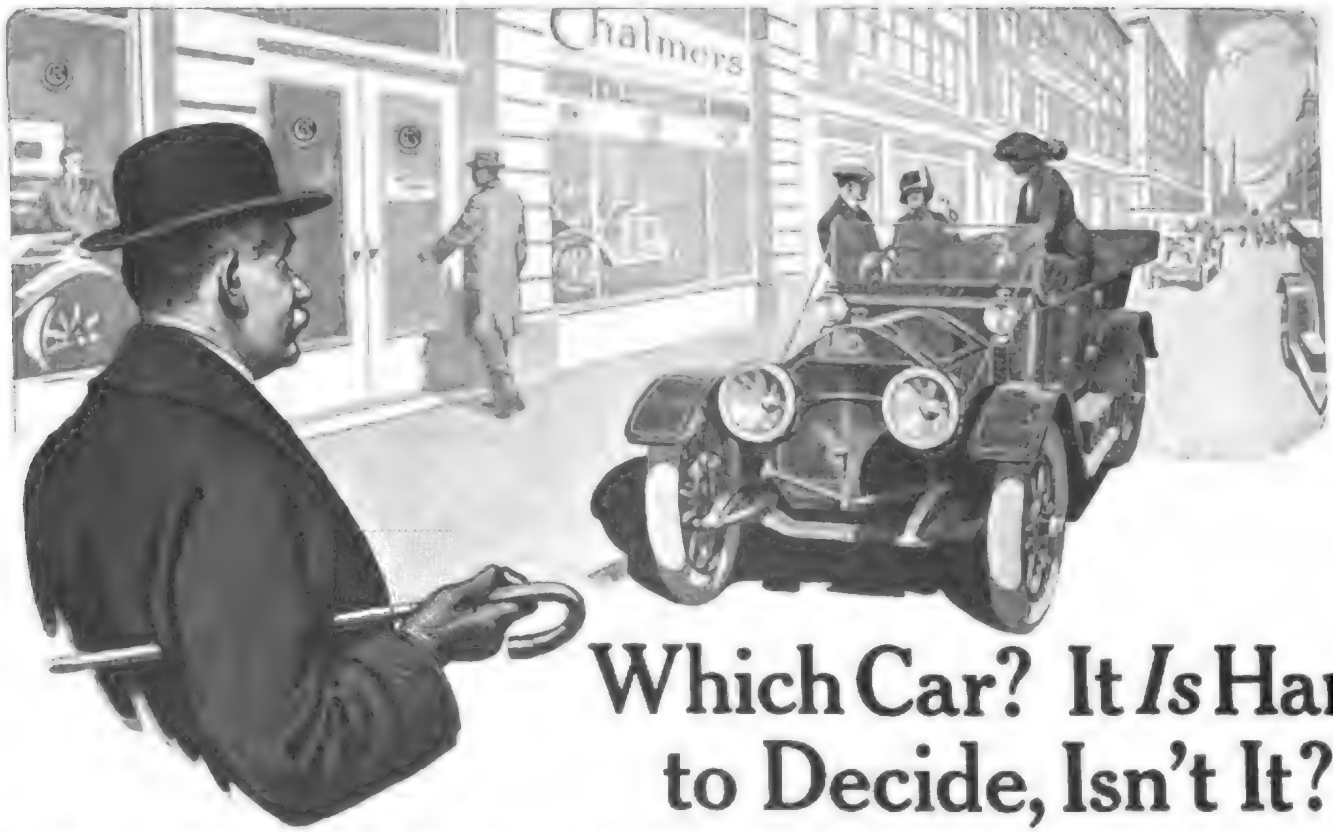
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Which Car? It *Is* Hard to Decide, Isn't It?

TO you who are trying to decide which car to buy—we want to offer a few suggestions.

You have looked at many different makes of cars. You have found that in most respects they are very much alike. They have nearly the same specifications; the same equipment; the same general appearance—at least, while new.

To choose wisely, you must look into all the unseen factors, in which lie the differences between cars. Study the cars, of course. Insist that your car have all the modern features. But before you invest your money—whether you buy a Chalmers or not—be sure to get satisfactory answers to the following questions:

1. How long has the company been in business?

Is it a sound, well-managed institution? Has it demonstrated its ability to manufacture successfully? Is it progressive? Is it likely to be in business permanently? Is it big enough and strong enough to attract the best class of dealers?

The kind of car you get depends absolutely upon the kind of a company that is behind it.

No company is more firmly established or better managed than the Chalmers. It has long been "first" in its class.

2. Does the company manufacture its own parts or merely assemble?

This is a vital question. The company that eliminates the parts-makers' profits is able to put into its car better value for your money. It can manufacture its own parts more accurately, and it can give you service and supply your needs for years to come.

No automobile company manufactures a greater proportion of the parts of its car than the Chalmers Company.

3. What do owners say about the car? Are they satisfied?

Owners of a car are the people who know. They are the ones whose opinion is the result of experience—satisfactory or otherwise. So take the general opinion of the owners and you will make no mistake. Be guided by their opinion of car, company and dealer.

Chalmers owners are satisfied. We are glad to have you ask their opinion of Chalmers cars.

4. Has the car itself quality or is it merely a collection of "features"?

Be sure the car you buy has the real "class" and in-built quality that comes only from painstaking workmanship all the way from designer to final inspector.

Chalmers cars have all the "features" and all the conveniences that any cars have. In addition they have Chalmers quality in every line, in every part.

5. Will the car command a good price in case you care to sell it two or three seasons hence?

Of course you are not buying your car with the idea of selling it. But it is well to know that you can sell it at a good price—if later you want to do so. Furthermore, the cars that bring good prices second-hand are the cars that are standard, the cars that are built to last, the cars that the public knows are good.

Chalmers cars have for years brought the highest second-hand prices of any cars in their class.

"Thirty-Six" (4 cyl. 36 h. p.)	**$1950**
"Six" (6 cyl. 54 h. p.) .	**$2400**
"30" (4 cyl. 30 h. p.) .	**$1600**

(Prices include full equipment and are f. o. b. Detroit)

THESE cars have all the modern features of convenience and comfort. In power, speed, comfort and convenience, in beauty, style and luxury the Chalmers offers you the utmost value.

But greater than these tangible things, more valuable to you, more worth the money you invest are the intangible things behind the car—the Chalmers factory and the Chalmers organization. No other cars can give you these added values that make the Chalmers the choice of the wisest motorists.

If you make careful comparisons, we believe you will decide on the Chalmers. And when you do we urge you to place your order at once. It's not long till spring now, and the only way to insure early delivery is by an early order.

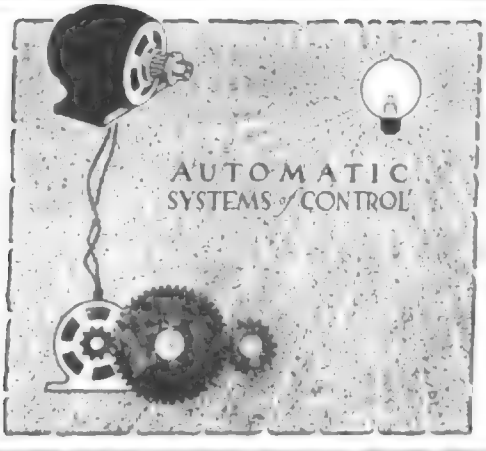
Chalmers Motor Company, Detroit

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The Ward Leonard System

No car complete without it

WARD LEONARD



Lighting - Starting

The completely equipped car of the future will as surely have a reliable and efficient lighting and starting system as it will have tires.

The motoring public has been educated to demand electric lighting and starting, and its demands can be easily and satisfactorily met by the installation of the WARD LEONARD SYSTEM. Motorists want electricity to light and start their cars. Manufacturers have always desired to give it to them, but they have failed because they have absolutely missed the connecting link between satisfactory lighting and starting, and the automatic control of the lighting dynamo.

It is this control of the dynamo that gives the WARD LEONARD user satisfaction with his lighting and starting outfit. We use a shunt-wound dynamo for lighting and a series motor for starting. Every electrical engineer knows that the use of these two standard devices, not joined in the same unit, represents the height of electrical experience and judgment.

No guess work about the WARD LEONARD SYSTEM. Its electrically operated switch controls the amperage with absolute regularity, regardless of the speed of the automobile.

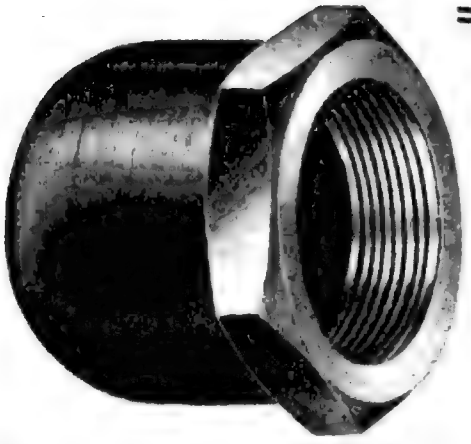
Engineers the world over have endorsed the WARD LEONARD design. Satisfied users in all parts of the earth testify to the practical perfection and the unerring operation of the finished WARD LEONARD product.

WARD LEONARD ELECTRIC CO.

BRONXVILLE, N. Y.

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Endurance Gives Satisfaction

Parts of automobiles, motorcycles and accessories must be made accurate to stand severe strain.

NAMCO products are made exactly to your specifications. The threads are clean and accurately cut. They start easily and fit correctly. This snug fit makes them hold under the pound and jar of rough roads. They reduce repairs and help to make your car a satisfactory investment to its owner.

We carry also a full line of cap and set screws, A. L. A. M. and hex. brass nuts.

Send us one of your parts. Let us show how economically you can buy NAMCO parts —how much they will save you in the end. Ask for the "Special Milled Products" book.

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Automatic Screw Machines and Their Products

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WHITNEY





The Most Practical Chain for Motor Trucks





Because the "Whitney" Cotter Detachable Chain can be easily separated at any link and lengthened, shortened, or repaired without the use of any special tool. This is of great advantage to truck builders, owners and drivers.

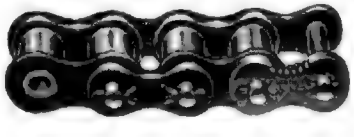
"Whitney" Chains are used by the leaders because they are strong, accurate, dependable and above all long lived. They are made right and they're made from the right kind of material, thus giving highest efficiency. When making replacements insist on a "Whitney."

"Whitney" Chains Are Built for Strains

THE WHITNEY MFG. CO., Hartford, Conn.





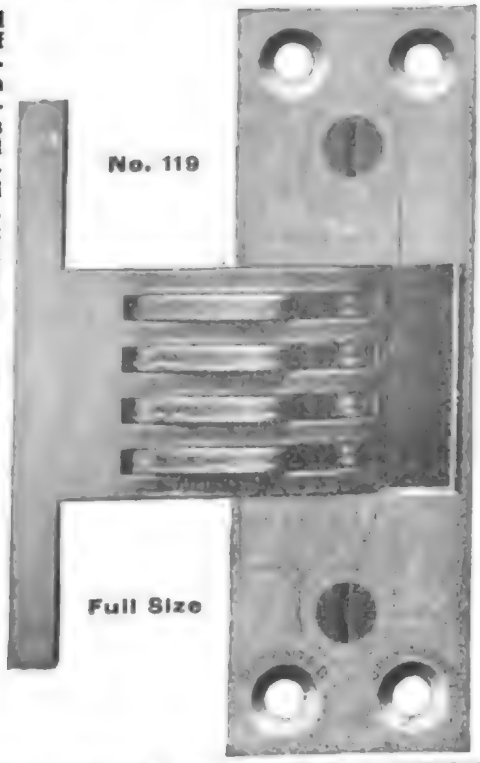


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The detachable and water-tight features of our No. 119 Automobile Door Hinge, in addition to the interlocking action, makes this the best, as well as the strongest constructed concealed hinge on the market. Made in two parts, it is easily attached and detached. Water will not reach the wood of the body through the hinge. When installed holds the door rigid and at the same time has a perfectly smooth action.

Send now for catalog and full particulars.



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Dependable Deliveries



DELIVERY dates are of utmost importance. Delay in shipments means loss of money.

We guarantee prompt deliveries. Warner Quality and Warner eight-year old reputation for making highest class gears is back of the product.

Car makers interested in the Quality and Merit that means absolute safety and satisfaction will do well to write.

We modify our designs to meet detail requirements, or build to approved designs on season quantity specifications.

Philadelphia, Glenwood Av. and 2nd St.
Detroit, 628 Ford Building

Warner Gear Co.
Muncie - Indiana

BOSCH

Spark Plugs



IN the 14 important automobile road races of 1912, Bosch Spark Plugs were on every winner—14 long, trying contests—14 proofs of Bosch Plug superiority. These tests included

The Vanderbilt Cup
Elgin Trophy
500 Mile Sweepstakes
The Grand Prize
The Santa Monica
The Aurora Trophy

When the majority of racing drivers and manufacturers entering cars in important road races use one make of plug you can be positive that reliability and efficiency are in that plug; you can be assured of its meeting your every requirement.

When fitting out be sure you buy Bosch Plugs; they are as good as Bosch Magnetos.

From Your Dealer or Direct from Bosch **$1.00 Each** **IN THE U.S.**

Write to-day for "Locating the Spark Plug"

Bosch Magneto Company
224 West 46th Street, New York

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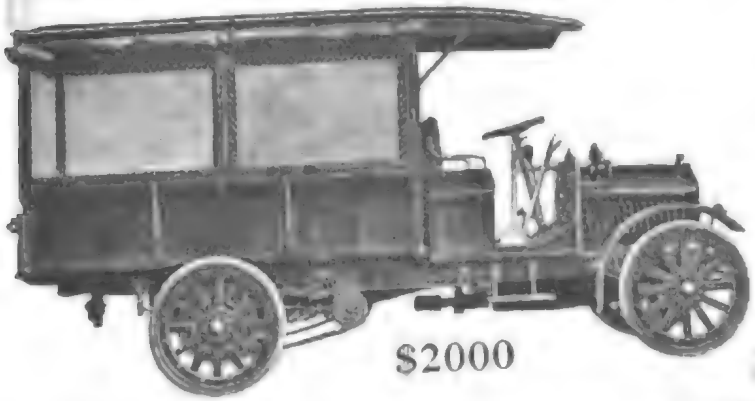
THE SELDEN TRUCK

Is the result of careful study and well directed effort on the part of expert truck engineers to produce a stronger, better, and more efficient truck than any other of like capacity, regardless of cost.

The Selden is acknowledged the

BEST ONE-TON TRUCK ON THE MARKET

It embodies *every* feature that stands for efficiency and economy. It is the highest type of commercial car. Prove it yourself by making an investigation. Compare its construction, part by part, with any other one-ton truck.



$2000

Sold on Easy Terms

Agents make 5 sales on these terms to 1 on a cash basis.

Some desirable territory is still unassigned. Write today for agency proposition and complete details of the Selden Sales Plan. Give sales and service facilities.

Selden Truck Sales Co.
184 East Avenue, ROCHESTER, N. Y.



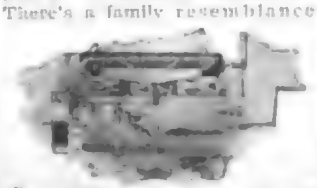
SHOW NOTICE: See the Buda "Little Six" at the Commercial Car Show, February 1st to February 15th. Spaces No. 102, 103, 104, located on Columbus Avenue and floor.

SPECIAL NOTICE: We have recently opened a new department for the manufacture of transmissions for electric self starters and forged steel ring gears for fly wheels. We invite inquiries for this class of work.

"Mr. Manufacturer: Let's Get Acquainted"

"You already know The Buda family of "Fours"—those Pioneers of the "Cast-in-Block" method in U. S. I am the latest family increase. Believing that everything experimental has been eliminated from my behavior and that I am fit to be trusted with the family reputation, I am now introduced to the Society of Motordom. I am at your service."

MY PORTRAIT
There's a family resemblance



Buda "Little Six," Model "SS"

1108 So. Michigan Ave., Chicago

"LITTLE SIX"

BUDA MOTOR

3¾" bore x 5½" stroke

"The Part That Sells The Car"

Send for Special Bulletin to

BRANDENBURG & COMPANY

57th & Broadway, New York City

SOME OF MY QUALIFICATIONS

Long stroke, enclosed valves, with large working diameter of 1⅝", noiseless turning gears, 3 point suspension, special self-contained oiling system with positive plunger pump, extra large bearings, centrifugal water pump, ample water jacket, etc, etc.

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The Largest Automobile Supply House in America

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at the

AUTOMOBILE AND MOTOR BOAT SHOWS

We are now collecting data for our 1913 Annual Catalog, which will contain 256 or more pages and will have a circulation of not less than 100,000 copies throughout the world.

Manufacturers of ACCESSORIES, who are making Parts, Fittings and Sundries for use on Automobiles, Motor Boats, Motorcycles or Aeroplanes, are requested to send us catalogs or circulars and make us a proposition regarding cataloging and handling their material, and, in quoting us, please take into consideration the fact that we have **Fourteen Branch Stores** and quote our prices F. O. B. Each Branch.

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THE CROXTON SIX

The car for 1913 is pre-eminently the Croxton Six. Made with all the strength we have put into our taxicabs with new exclusive features and extreme elegance of line and finish.

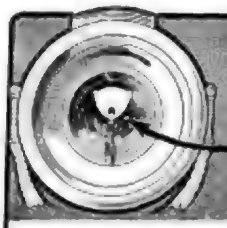
You should know more about this car; also about the new model "Croxton Four."

The name Croxton on your car will show that you have a machine built for service and comfort, by experienced, successful engineers.

Write for catalog giving full specifications. Ask for Booklet A-2.

The Croxton Motor Car Co.

WASHINGTON, PENNSYLVANIA



The flame is always just this high when you use

The Prest-O-Lite Automatic Reducing Valve

With this device attached to your Prest-O-Lite, you do not have to turn the tank valve up or down to get the correct flame in the lamps.

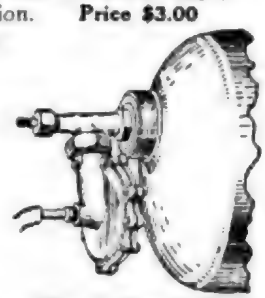
Turn on the gas, light your lamps, and the flame is bound to be just right, without any adjusting.

It pays for itself in gas saved, so its convenience costs you nothing.

Unlike other reducing valves, the Prest-O-Lite Automatic gives the correct gas pressure **at all times,** whether the tank is full, half full, or nearly empty. It is truly automatic in its action. **Price $3.00**

Anyone can attach it in less than five minutes.

Your dealer has it or will quickly get it for you. If not, we'll send it to you on receipt of price. Try your dealer first. Every Prest-O-Lite Branch Office has this Automatic Reducing Valve in stock.



The Prest-O-Lite Co.

287 E. South St. Indianapolis, Ind.

Canadian Branch Factory and Office, Merritton, Ont.

Price in Canada, $3.50

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The Atwater Kent Ignition System



Time was when automobile engineers and the general motoring public thought they must equip their cars with a magneto. Today this idea is fast waning—in fact, it has been discarded by many of the foremost automobile engineers and discriminating motorists who are now demanding a more dependable source of current on their cars.

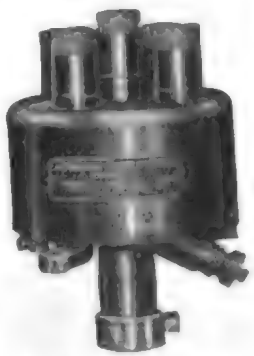
The increasing use of electric lighting and starting equipment necessitates an ignition system better than the magneto—a system producing a uniformly hot spark at low speeds as well as high—a system giving a hot starting spark with the motor at a standstill—a system that is simple in principle and mechanism as well as in operation, and reasonable in initial and maintenance cost—in brief, a system of ignition that will measure up to the highest requirements of the most modern automobile practice.

Such is the Atwater Kent Ignition System—embodying the best features of both magneto and battery, without the weaknesses of either.

Remember the Atwater Kent System can be easily and quickly installed on any standard make of motor, new or old, without the price of a magneto.

If you have an unsatisfactory magneto, or if your motor is not equipped with a half time shaft, you can use the Atwater Kent System by means of our magneto gear mounting, the cost of which is nominal.

In addition to our standard Type F System, we are marketing a new model —Silent Type K with automatic spark control and insulated primary circuit.



Whether you are interested in motor cars as manufacturer, dealer, owner, or prospective buyer, you should have a copy of our booklet "D." It covers the subject authoritatively and thoroughly and even the most experienced will find it interesting reading.

ATWATER KENT MFG. WORKS

4940 Stenton Ave. Philadelphia, Pa.

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400 SOLD DAILY

This is not the record of a single day. This is a daily average—for four months ending with January—of cars newly equipped with Remy magnetos. These figures have never been approached by any other manufacturer.

Inductor Type—Simplest, Strongest

Built for 24-hour a Day Service

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World's Largest Ignition Factory

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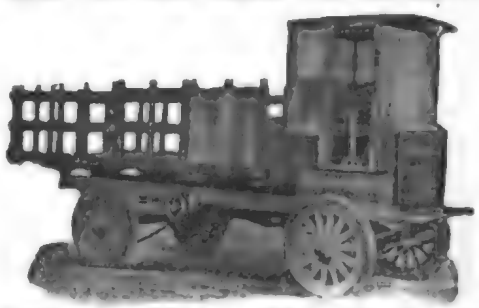
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measure speed by centrifugal force, which is stable, fixed and unvarying for each speed.

The instruments are permanently accurate because there is nothing to adjust, nothing to balance, nothing to counterpoise, nothing to compensate.

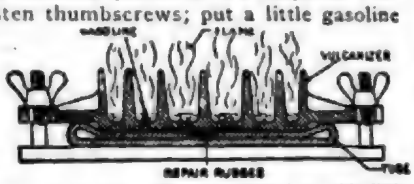
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Directions: Place tube between plates of the Imperial Vulcanizer (see cut); tighten thumbscrews; put a little gasoline in pronged receptacle; ignite. You have made a permanent repair in 15 minutes; saves time; and saves money.



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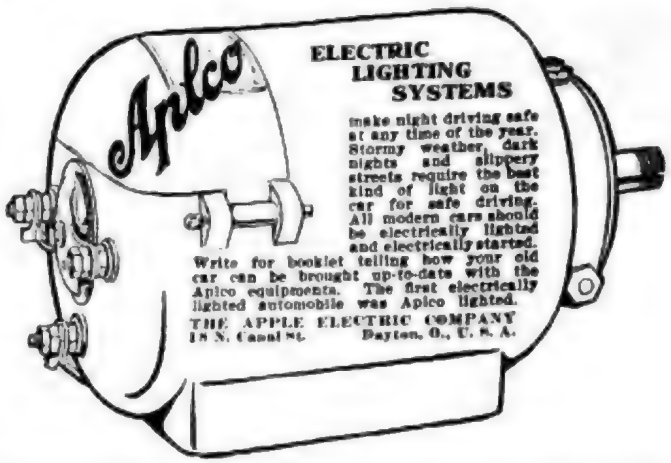
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make night driving safe at any time of the year. Stormy weather, dark nights and slippery streets require the best kind of light on the car for safe driving. All modern cars should be electrically lighted and electrically started.

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Increases Power
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We also make Duplex and Raymond Brakes and Gyrex the Mixer.

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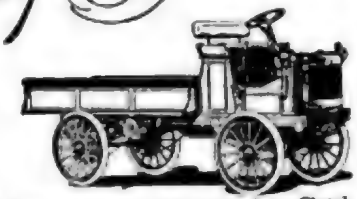


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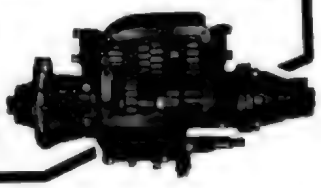
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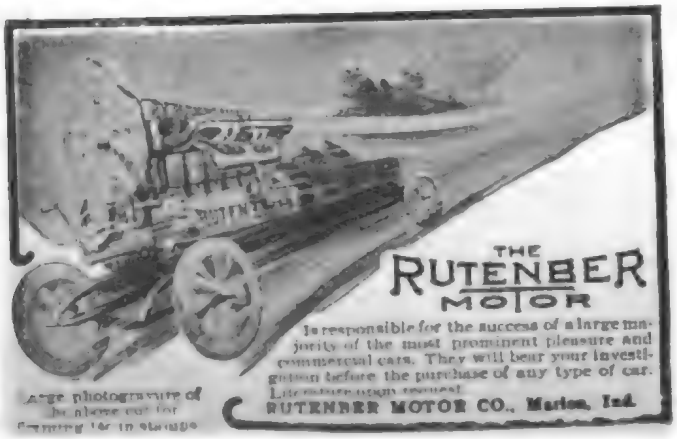
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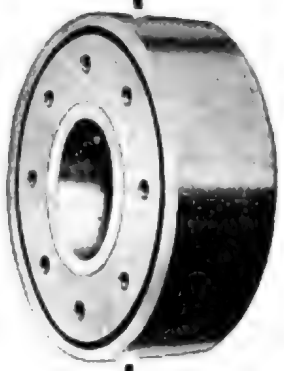
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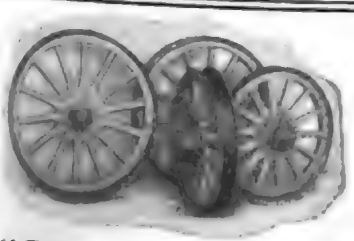
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One Passenger to 16 Tons Capacity

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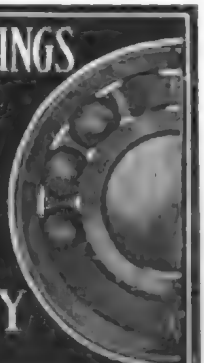


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from base to spark plug, have features that are "Different and Better."

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Kupmobile

Kupmobile "32" Touring Car, Fully Equipped, $975 F.O.B. Detroit

Long-stroke motor, 3¼ x 5½ inches. Enclosed valves. Three bearing crank shaft. Unit power plant. Multiple Disc clutch. Three speeds forward. Sliding gears. Full floating axle. Center control. Zenith carburetor. Bosch magneto. 106-inch wheelbase. 32 x 3½ inch tires. Quick detachable rims. Mohair top with envelope. Jiffy curtains. Windshield. Rear shock absorber. Prest-O-Lite tank. Gas headlights. Oil side and tail lamps. Tools—horn. Trimmings, black and enamel. Standard color, black. Magneto and camshaft driven by silent Coventry chain.

Kupmobile "32" Roadster, Fully Equipped, $975 F.O.B. Detroit

Chassis and specifications same as Touring Car. Large turtle back dust proof compartment for extra accessories, tires and baggage.

Kupmobile "32" Delivery, Fully Equipped, $950 F.O.B. Detroit

Chassis same as Touring Car. Enclosed panel body. Two cushioned lazy-back seats. Carrying capacity, 800 lbs. Chassis and body painted black, high-class finish. Two-piece windshield. Prest-O-Lite tank. Gas headlights. Oil side and tail lamps. Quick detachable rims. Tools—horn. Trimmings, black and nickel.

KUPP MOTOR CAR CO., 1264 Milwaukee Ave., Detroit, Mich.

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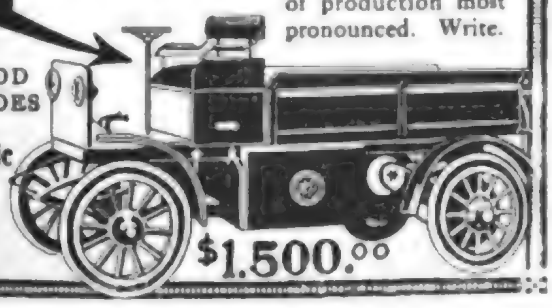
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$1,500.00

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The Six "48" Keeton
Compares with the best foreign cars

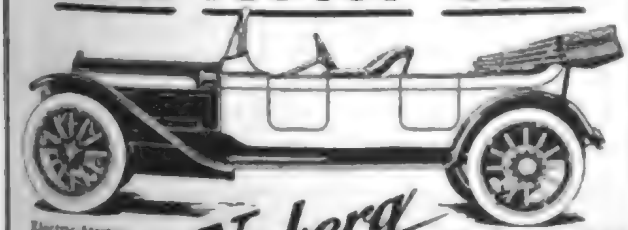
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CARTERCAR COMPANY, Pontiac, Michigan

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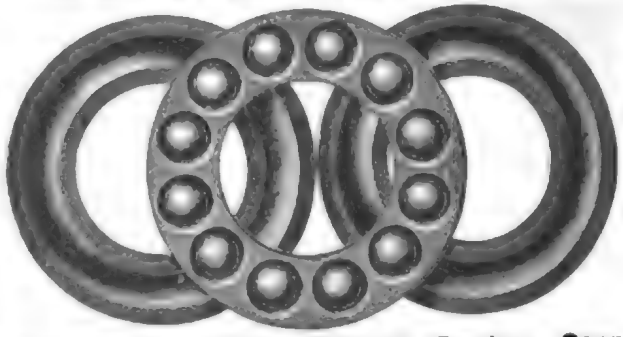
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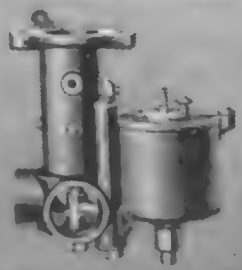
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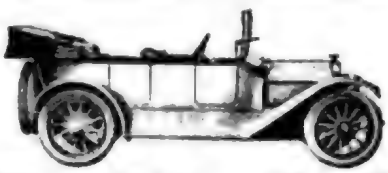
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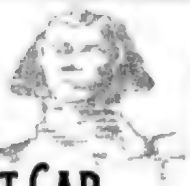
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The first American Car to adopt the Silent Knight Motor—the engine used by Daimler, Mercedes, Panhard and Minerva.

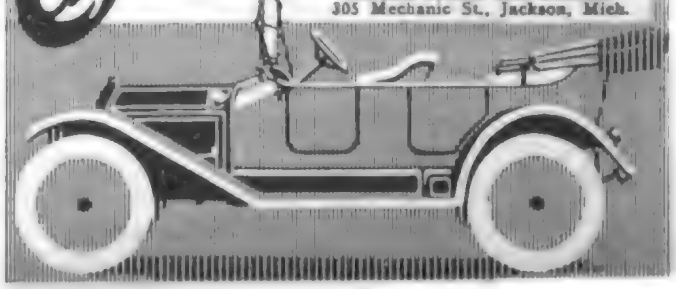
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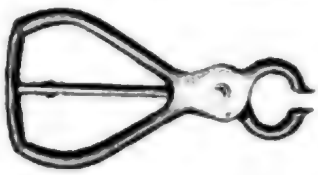
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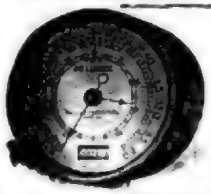
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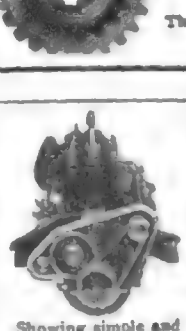
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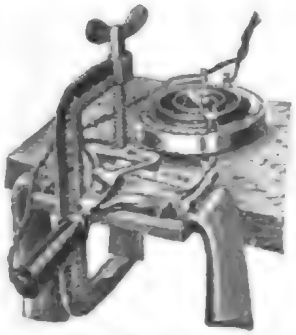
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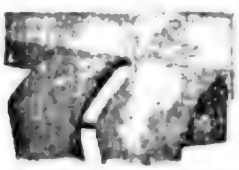
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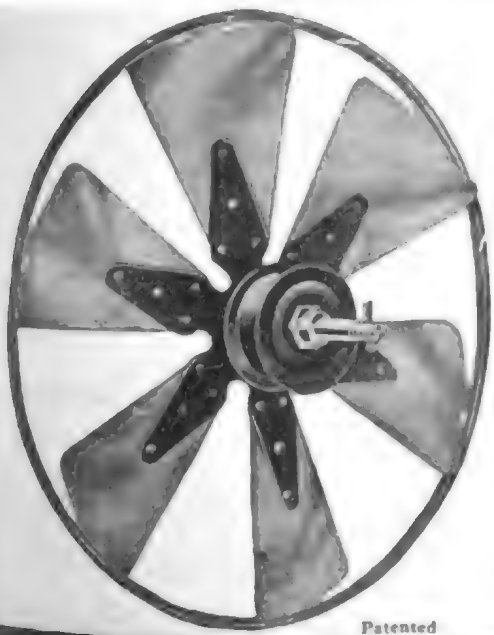


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The truck has been well advertised and is favorably known and has made good.

There is nothing wrong about the concern except the stockholders are not compatible. The company does not owe a dollar.

I have the future disposition of this plant in my hands, and I know the truck business, from buying raw material to selling its finished product. The entire assets can be had for fifty cents on the dollar (actual inventory is about $175,000) and there are no liabilities. I want the right man or men to couple up with me and take over the business. It has a tremendous future.

Full particulars to legitimate inquirers.
BOX 245, care Motor World.

AUTO LEGAL MATTERS

Have you a troublesome chattel mortgage, bad insurance, or disadvantageous contract, bad debts you want to collect? Do you want to borrow money, or need expert legal advice? I specialize in automobile law. Charges nominal. EDWARD ENDELMAN, Attorney at Law, 299 Broadway, Manhattan, N. Y. C.

SIMPLEX 90, with touring and racing equipment in A1 condition. Cost $7,500. For sale, $2,000. J. A. FORSYTHE, JR., 350 E. Forsythe St., Jacksonville, Fla.

WELDING and cutting of metals, automobile work a specialty; all kinds of broken machinery repaired; chassis lengthened and repaired; all kinds of brazing. I will cut designs out of steel plates. E. W. SOLEAU, 264 DeWitt Ave., Belleville, N. J.

OFFICE MANAGER, good executive ability, competent to handle correspondence, accounts, handling salesmen, etc.; wants to relocate. Now with motor truck company. Box No. 244, Motor World.

FORD OWNERS—Our spare demountable wheel cures tire trouble on the road. Attention, Doctors. Write, ANGIER'S, Streator, Ill.

CADILLAC 1911,
$675—5-passenger; top, windshield, slip covers, Prest-O, speedometer, extra shoes and tubes; entirely new; any demonstration. DUKE, 57 East 108th St., New York.

WANTED—To buy good second-hand radiator and fan to cool a 35-horsepower engine. Address BOX 54, Cushing, Iowa.

TO EXCHANGE—Mitchell Model G and lot in thriving town of Ashdown, Ark., for Buick roadster, 1911 or 1912 model, or other make as good. Address LOCK BOX 583, Pittsfield, Ill.

$400 BUYS, COST $1,000
Atterbury truck, 1912, half ton, panel top, hard tires, chain drive; sold because owner bought larger capacity. DUKE, 57 East 108th St., New York.

WE weld any aluminum crank or gear case for $6. Prepay all packages ALUMINUM WELDING CO., 1012 Walnut St., Cincinnati, O.

"CAST IRON and Aluminum Welding," we start you in your own town. Booklet 10c J. R. LUCKEY, 1012 Walnut St., Cincinnati, O.

FOR SALE—Brush car, in good running order, complete, with top, extra tire and full equipment of tools; at a bargain. Address P. JONAS, 780 Oelaware Ave., Milwaukee, Wis.

$1500 will purchase five-ton Couple Gear Electric Truck, recently overhauled and in fine shape. All tires in perfect condition recently applied. KNOWLTON WAREHOUSE CO., Buffalo, N. Y.

AUTO LISTS, owners, etc., of any State S. H. CARROLL, JR., Albany, N. Y

INVESTIGATE THIS. I have a device that will bring in any auto or truck that has broken wheel, axle, etc. I need partner with some capital to put it on the market in quantity. Get photo and description. O. G. GUSS, Delphos, Ohio.

FOR SALE—Garage, equipment and business at Hobart, Okla., county seat of 5,000, two railroads, prosperous and growing agricultural section surrounding. Weather and roads such that everybody uses the auto the year round. No tie up for snow and ice. Come or write. D. A. SCOTT, Hobart, Okla.

FORD Model T Reference Book" gives cause and cure of all the ails of Model T simply and concise. Gives the latest kinks. Full of pointers. Written especially for it. Elaborate cross index enables you to discover any trouble at once. Write for descriptive circular or sent postpaid, $1.00. FORD REFERENCE BOOK CO., 57 West 125th St., New York.

TOPS AND SEAT COVERS.
High-grade material and experienced workmanship in either case. Our Tops are built to look right tomorrow and a year from tomorrow. Our Seat Covers can be cleaned to look like new, with gasoline or soap and water. We're glad to estimate special work or quote prices on stock goods. Prompt service assured. CENTRAL AUTO TOP CO., 120 W. Mich. St., Indianapolis, Ind.

FOR SALE—Garage, fully equipped, within 50 miles of New York City. Two-story brick building, steam heat, 1,000-gal. gas tank, full stock of oils, greases, supplies and accessories. Agency for two standard non-competing cars. Storage for 35 cars. This is a rare chance for a live man. Ill health of owner reason for selling. Address Motor World, Box 241



An ad. like this will cost you 75c. for each insertion.

These columns offer you an opportunity to appeal to an audience of 8,000 readers whose merchandising taste is being cultivated

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For Sale—Wants—Exchange

15 cents per line of six words, cash with order. — In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

PEERLESS AUTO TOP DRESSING.
A waterproof dressing for leaking mohair and duck tops and curtains. Makes old and faded tops look like new. Ask your garage and supply dealer for it.
The Columbus Varnish Co., Columbus, O.

AR-GEN-TOR will deposit a beautiful silver plate on your brass trimmings in one minute. Absolutely reliable. Price $1.00. Send for package. Quit polishing brass. FOREST CITY SALES CO., Fremont, Neb.

WANTED TO BUY—Five or seven passenger automobile for cash, in good condition; no dealers. 172 Pacific St., Brooklyn, N. Y.

LOT in Velasco, Texas, for automobile or motor boat; paid $1,000 20 years ago. TOM CHILDRESS, R. F. D. No. 2, Arlington, Texas.

PEERLESS EXTRA FINE BLACK JAPAN.
Covers solid one coat for enameling lamps, radiators and fenders. No undercoat required. Heat does not affect it. Ask your garage and supply dealer.
The Columbus Varnish Co., Columbus, O.

ALUMINUM vulcanizers for both casings and tubes. $3.50 prepaid to any address. Money back if not satisfactory. TRUSCOTT SUPPLY CO., St. Joseph, Mich.

RURAL Parcels Post Delivery Car—Any party with capital and push interested in placing one on the market, correspond with E. P. COWLS, Sparta, Mich.

WANTED—New or slightly used unit power plant, 25 or 30 H.P., 4 cyl. Must be a bargain. BENTON & IVES, Kiowa, Kans.

AUTOMOBILE CYLINDERS reground, new pistons and rings fitted. Garage air compressors. CAST IRON BRAZING CO., Manchester, N. H.

PEERLESS LEATHER TOP DRESSING
An oil preparation that softens the leather and pantasote. Makes old tops look like new. Ask your garage and supply dealer for it.
The Columbus Varnish Co., Columbus, O.

WANTED—Salesman for agencies in every city to install new process in demand, showing over 300% profit to garages, supply dealers, breweries. Entirely new, big seller. This means big money. Experience not essential. H. J. WEBER, South Orange, N. J.

PEERLESS LINING DYE.
Dyes the cloth linings of tops and curtains a black, uniform color, covering up water stains and grease spots. Does not wash off. Ask your garage and supply dealer.
The Columbus Varnish Co., Columbus, O.

FOR SALE OR LEASE—The most modern garage in Southern Colorado, with fine repair shop and storage room for sixteen cars, doing good business and fine prospects for coming year. A snap for someone. Address BOX 208, Monte Vista, Colo.

FOR SALE—Cheap, one American Traveler, color battleship gray; just like new; run a little over 4,305 miles. MICHIGAN AUTO CO., 410 7th St., Calumet, Mich.

ARE YOU in need of any additional help in any department of your business? Are you out of employment or looking for a better connection? Have you second-hand apparatus of any kind or do you want to buy second-hand material. Have you a factory site for sale or do you want to buy one? If so, use the Want and For Sale column of the Motor World. Seven words to the line, fifteen cents a line. Advertisements can be inserted over a number when it is desired and identity of the advertiser will be kept confidential.

PEERLESS BACK AND CUSHION DRESSING.
Softens the leather and will not crack, wash or rub off. Makes old leather look like new. Dries in twenty minutes. Ask your garage or supply dealer.
The Columbus Varnish Co., Columbus, O

BROKEN Cylinders and Crankcases—Send them to be made good as new at fraction of replacement cost. Scored cylinder repaired, $12. No new piston and rings required because bore is not enlarged. Where cylinders are worn (not scored from loose wrist pin) reboring is only remedy. We do it expertly. Write for complete information and estimates. WATERBURY WELDING COMPANY, Waterbury, Conn.

WANTED—A first-class man to take the agency for the latest invention on the market, a rubber cover for automobile handles called Steerease; write for full particulars. Address DEPARTMENT E, GOODYEAR RUBBER HOSE AND PACKING CO., 221 Chestnut St., Philadelphia, Pa.

PEERLESS EXTRA FINE BLACK BAKING JAPAN.
Bakes either to a high gloss finish, eggshell gloss or dull finish on lamps, radiators and fenders. Will not crack, chip or peel. Ask your garage and supply dealer.
The Columbus Varnish Co., Columbus, O.

BROKEN CRANKSHAFTS, cylinders, crankcases, flywheels, gear teeth, pistons, perfectly welded and machined ready to replace. Guaranteed and references. Machinery up to 5 tons welded. ATLAS WELDING WORKS, 74-76-78 Irving St., Rahway, N. J.

AUTOMOBILE FOR SALE—1912 Marmon Speedster, Indianapolis Speedway type car. A-1 condition; run 4,000 miles. For particulars apply W. F. BURROUGHS, 66 Midland Ave., Arlington, N. J. Tel. 29 Arlington.

FOR HIRE—White 1½-ton truck by week. CHAS. HONEHEIN, 2027 3rd Ave., New York City.

KEROSENE FOR AUTOMOBILES.
New Model B uses successfully half and half mixture lowest grades kerosene and gasolene. Satisfaction guaranteed or money refunded. Greatly increased power, very slow speed on high. Starts easy at zero. Special agents' prices. Dept. 8. THE AIR-FRICTION CARBURETOR CO., Dayton, Ohio.

weekly to the highest degree by our articles on "Wide Awake Merchandising." Look at the cost as shown in the margins.

An ad. like this will cost you 90c. for each insertion.

"PIONEERS"

THE HESS-BRIGHT MANUFACTURING COMPANY

Pioneers in the introduction of Annular Ball Bearings

Most extensive Resources and Plants in existence exclusively for Ball Bearing manufacture.

Enlarging and improving facilities—product and capacity for distribution.

Main Offices and Plant No. 2:

On Line of Pennsylvania R. R. to New York

Front St. and Erie Ave.

Philadelphia, Penna.

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Why the Chicago Electric has been Klaxonized

"PRIOR to the use of your horns, we always equipped cars with bells. One of the difficulties in connection with using bells was the fact that they became inoperative in the winter time due to slush, mud, etc. To find out what your horn would do under such circumstances, we packed the horn from tip to the diaphragm full of snow and found that after one or two applications of the button the snow freed enough to give a very distinct signal and the muffling effect was practically negligible."

Excerpt from a letter by the President of the Chicago Electric Motor Car Co. to the Makers of the Klaxon.

And there are 5 other electrics—42 gasolene cars—regularly Klaxon-equipped

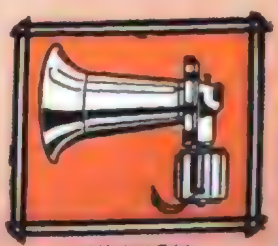


KLAXONET

Lovell-McConnell Mfg Company Newark, N.J., U.S.A.

KLAXON

"The Public Safety Signal"



KLAXON

Studebaker

You Cannot Exaggerate Studebaker Quality

STUDEBAKER automobiles are built as well as automobiles can be. From radiator to rear-axle they lack nothing a good automobile should incorporate.

Studebaker automobiles are built in three sizes—a "25"—a "35"—and a "Six." But each car, whatever its size, owes nothing to its brother in construction perfection, in materials, or in the quality and integrity of its sterling Studebaker manufacture.

You cannot buy better VALUE, nor sell better VALUE, than Studebaker cars.

The Studebaker "35" at $1290 is a six passenger, four-cylinder car with 116-inch wheelbase, deep, luxurious upholstery, and scientific spring suspension, which insure solid motoring comfort. It is an electrically started and lighted car—a car embodying every piece of equipment that gives the stamp of thorough up-to-dateness. The motor is of the enclosed valve type—the cooling system the most efficient yet devised—and the full-floating rear axle banishes all possibility of axle trouble.

The Studebaker "Six," at $1550, is six-cylinder long stroke construction perfected. In mechanical efficiency, elegance and luxury the Studebaker "Six" stands pre-eminent. Electrically started and lighted. Motor cast enbloc from best close grain iron—a quiet running motor of tremendous reserve power. Also a six-passenger car.

The Studebaker "25" is a light weight car equal, however, to the most strenuous service. The steels used in this car are the same heat-treated as carefully and as many times as those of the "35" and "Six"; designed by the same engineer and built by the same skillful workmen. The Studebaker "25" is a thoroughbred throughout.

Three truly great cars, Mr. Dealer, and just as truly three magnificent sales opportunities.

STUDEBAKER CARS

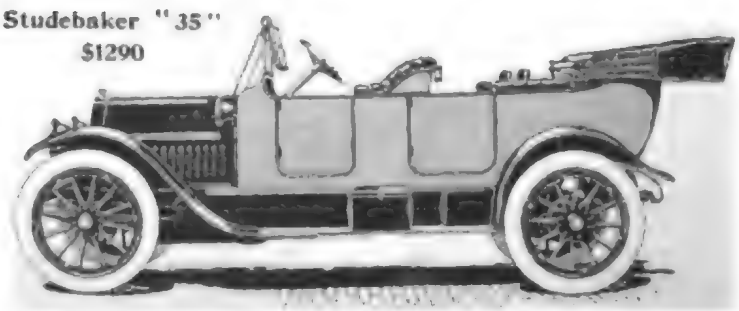
"20" Delivery Car	$ 825
"20" Roadster	835
"25" Touring Car	885
"30" Touring Car	1190
"35" Touring Car	1290
"35" Sedan Type	2050
"35" Coupe	1850
"Six" Touring Car	1550
"Six" Roadster	1550
"Six" Limousine	2500

All prices for cars fully equipped F. O. B. Detroit

The Studebaker Corporation

Detroit, Mich.

Studebaker "35"
$1290



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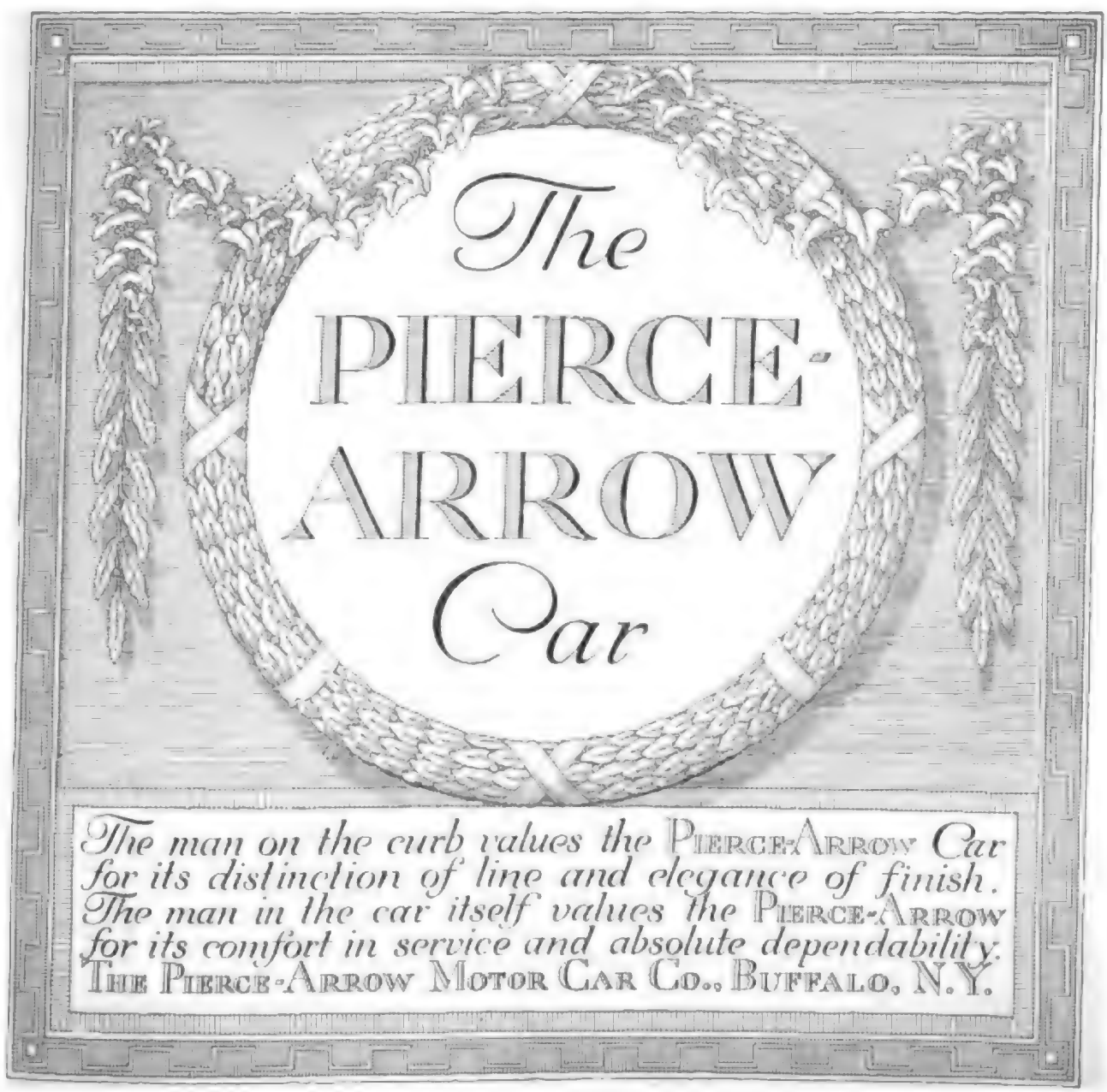
MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXXIV
No. 10

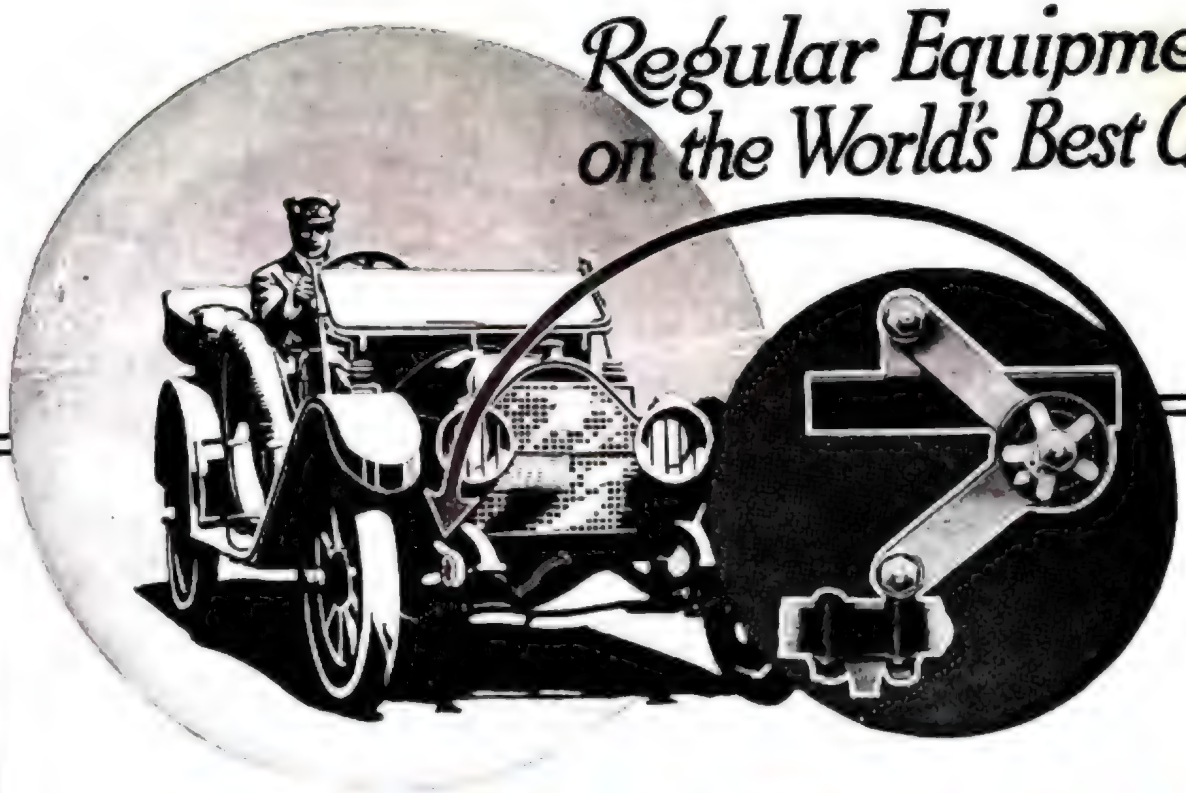
New York, February 27, 1913

Ten cents a copy
Two dollars a year



Published Weekly by the Motor World Publishing Company, 1600 Broadway, New York

Regular Equipment on the World's Best Cars



Truffault-Hartford SHOCK ABSORBER

TWENTY-FIVE engineers—master builders of the world's best cars—have turned to Truffault-Hartfords for maximum car comfort and made them a regular part of their supplied equipment. Without them, it is impossible to enjoy the utmost motoring ease, for they make good an always existing deficiency in spring construction. They prevent the violent rebounds which the spring itself cannot control.

Your riding comfort—and that's principally what enjoyable motoring amounts to—is made sure. Your springs are safe from breakage, your mileage is appreciably increased, and you're "in" a good bit on up-keep cost as a season's use will show. No motorist can afford to be without Truffault-Hartford Shock Absorbers—and least of all, the man who owns a six-cylinder car with a wheelbase of over 118 inches.

Five models—the New Automatic, $60; Standard, $50; Intermediate, $40; Junior, $25; Juniorette, $15, per set of four. See your dealer and write for our catalogue.

HARTFORD SUSPENSION COMPANY

EDW. V. HARTFORD, President

Manufacturers of Hartford Self-Starters, Shock Absorbers, Jacks and Bumpers

Office and Works, Jersey City, N. J.

Branch Offices and Dealers Everywhere

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DEALERS

Be Sure Your Cars Are

EQUIPPED

With

R·I·V Ball Bearings



IMPORTED Since 1904 — *Quality* — R. I. V. CO. 1771 B'way, N. Y.

DEALERS

Bearings of Recognized Worth are Ear Marks of Car Quality

DEALERS

Are the Cars You Represent R.I.V. Equipped?

The R. I. V. plant and organization were not built in a year or two. They have grown with the motor car industry and are the evolution of many years of designing and making bearings with but one idea in view—to produce bearings, every part of which should be absolutely right.

The theory of R. I. V. ball bearings has proven true in many thousands of pleasure and commercial cars.

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The Automobilist—
Get *His* Tool-Trade!



Billings & Spencer Tools

"The tools that are guaranteed"

Furnish the automobilist with the quality of tools he wants and you will get his permanent patronage.

Automobilists find that for reliability, ease of action and durability, the triangle trade-marked tools are unequalled.

Write today for catalogue.

Billings & Spencer Company
Hartford, Conn.

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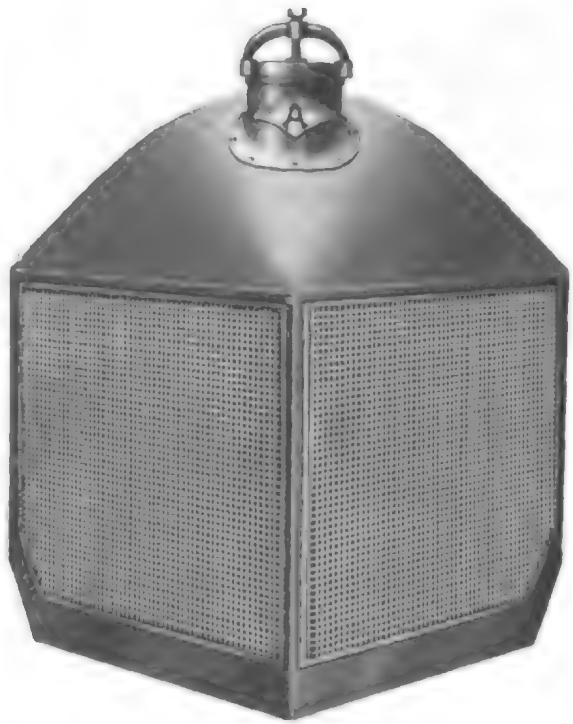
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Fedders Radiators



The square tube radiator is acknowledged to be superior to any other form of construction and Fedders design and methods of manufacture give Fedders radiators a standing second to none in the field.

Fedders Square Tube Radiators offer a maximum of radiating surface — all four sides are surrounded by water—cannot clog and can be repaired in short order by any tinsmith.

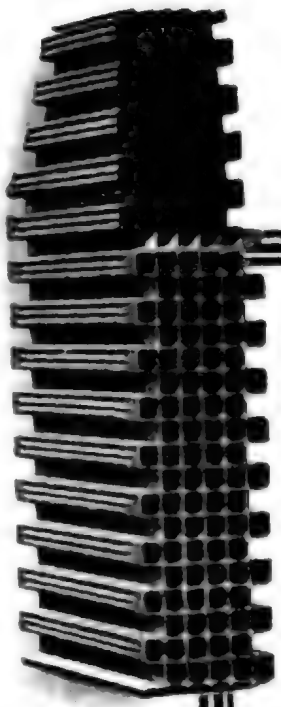
While we specialize on square tube types, we are also equipped to build on any specifications that may be furnished. Send us blue prints and our engineering department is at your disposal for co-operative work.

FEDDERS MANUFACTURING WORKS

BUFFALO, N. Y.

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Livingston Radiator



You truck makers and truck sellers need the selling force of Livingston Radiators more than any one else in the industry.

Your life, commercially, depends absolutely on the service of the product you are handling. Excuses and apologies won't go in the commercial field. You know it is a question of dollars and cents saving over other modes of delivery that makes it possible for you to sell trucks and commercial wagons.

Unquestionably one of the most serious liabilities in the average motor truck of today is its inefficient cooling system. Inefficient cooling means high cost of truck service because an overheated motor means loss of power—an overheated motor means excessive consumption of both gas and oil—and an overheated motor means time lost in filling and refilling the radiator, frequently necessary when water is to be had only by carrying it a considerable distance, in buckets full.

Livingston Radiators assure the greatest cooling efficiency with the least pounds of weight, the least wind resistance and with the greatest ability to resist stress and strain to which motor trucks are commonly subjected.

Livingston Radiators assure minimum truck operating cost in the all-important function of keeping the motor properly cooled.

LIVINGSTON RADIATOR & MFG. CO.
Randall Building, 52d St.
New York

We Build Radiators for Individual Car — Owners

All Types of Radiators Built Rebuilt & Repaired



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MOTOR WORLD

Vol. XXXIV New York, U. S. A., Thursday, February 27, 1913 No. 10

LEWIS RETIRES AS HEAD OF MITCHELL-LEWIS COMPANY

Unexpectedly Relinquishes Presidency to Representative of Banking Interests—Lewis Family, However, Retains Control.

Without an inkling that anything of the sort was contemplated, William Mitchell Lewis, on Wednesday of last week, relinquished the offices of president and general manager of the Mitchell-Lewis Motor Co., of Racine, Wis., with which he and his forebears have been intimately identified for at least two generations. His retirement created a mild sensation, as he was considered one of the Mitchell-Lewis fixtures.

The vacancy was filled by the election of Joseph Winterbotham, Jr., who became chairman of the executive committee in November, 1911, when the Mitchell-Lewis company floated a $2,500,000 note issue. Winterbotham represented the banking interests which stood behind the loan and has been their official representative in the Mitchell factory.

Mitchell's retirement gave rise to a variety of rumors, some of which involved its financial condition, but they were promptly repudiated by an official statement issued by the board of directors through William T. Lewis, chairman of the board, who is also the father of William Mitchell Lewis.

The statement declared that Lewis's resignation "had nothing whatever to do with the financial condition of the company, which is splendidly financed and never in better condition to serve the public."

Hereafter William Mitchell Lewis will devote his entire attention to his other interests, which include the Racine Rubber Co., formerly the Kelly-Racine Co., and the Racine Daily Times, the leading daily newspaper of Racine. The Times itself states that his retirement from the Mitchell-Lewis Motor Co. will have no effect upon its policy, adding that the Lewises, father and son, will continue to hold a controlling interest in the corporation.

Receiver for Syracuse Tire Jobber.

On the petition of the Firestone Tire & Rubber Co., among others, Claude L. Forbes, an attorney representing the Empire Tire & Rubber Co., was on Tuesday last, 25th inst., appointed receiver for the Central City Rubber Co., of Syracuse, N. Y. In addition to the usual charges of insolvency, it is alleged that the company had permitted some of its creditors to bring suits against it, and that it made preferential payments while in an insolvent condition. Its liabilities aggregate $35,000. The value of its assets are problematical. An effort is being made to effect a settlement on a basis of 25 cents on the dollar. As its title indicates, it dealt largely in tires, no less than six tire manufacturers figuring in the lists of creditors with claims between $500 and $4,000.

Louis Hupp Brings Monarch into Being.

Louis C. Hupp, former secretary and treasurer of the R. C. H. Corporation, of which his brother, R. C., was president and general manager until recently, has organized the Monarch Motor Car Co., of Detroit, which has been incorporated under the laws of Michigan. It will engage in the manufacture of a 30-horsepower, five-passenger touring car to sell at about $1,000, fully equipped. Temporary headquarters have been acquired on Scotten avenue, pending the closing of a contract for the erection of a modern factory building which, it is stated, already has been practically consummated. The names of those who are identified with Hupp in his new enterprise have not been disclosed.

Date Set for Sale of Thomas Assets.

March 17th has been set as the date for the receiver's sale of the assets of the E. R. Thomas Motor Car Co., of Buffalo, none of the real estate, however, being included in the sale. The property to be disposed of comprises 6,000 separate lots of machinery, equipment and parts.

"MOTOR SPIRIT" FAR FROM BEING RECENT DISCOVERY

But New Process Renders Quantity Production Possible—How Obtained and its Possible Effect on Gasolene Situation.

Whether or not the price of "gas" comes down "within a year," as not the press agent but a man high up in the Standard Oil Co. predicted to a Motor World man early this week, it is quite within reason to expect that the almost immediate production of quantities of what has been hailed as a new "discovery" under the name of Motor Spirit will have at least a steadying effect on the market.

Unfortunately, however, the immediate effect must of necessity be confined to the West, for the fuel, which, contrary to general belief, is not new at all and has been in use for five or ten years, though its production has been so limited that it never has constituted a real factor, is controlled by the Standard Oil Co. of Indiana under patents issued since the first of the year to W. M. Burton, who is the analytical chemist and a director of the Indiana company. Burton's patent covers a new process by which the fuel is produced and not the fuel itself, the process permitting of its production cheaply and in quantity, whereas the previous method of extracting it made the cost of its production for general use practically prohibitive.

Just what the ultimate effect of Motor Spirit on the market will be, it is difficult to foresee, though it is certain that its use in quantity in the West will at least release a like amount of real "gas," and even if it does not result in a reduction in current prevailing prices, it ought to put a crimp in the "demand and supply" theory. Similarly, what its price in the East will be, if it is available in the East at all, is problematical, for though its price in the West is understood to be about three cents a gal-

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lon less than that of gasolene, it is unlikely that there will be so great a difference, for the simple reason that the process is owned outright by the Indiana company and to utilize it elsewhere will entail the payment of royalty.

In appearance and in characteristics, Motor Spirit is not unlike gasolene, except that it is slightly yellowish in color and emits a more pungent odor when permitted to evaporate in an open dish; in fact, it virtually is a low-grade gasolene of from 54 to 56 Beaume and, as such, can be used instead of the lighter fuel in any internal combustion motor constructed for gasolene, provided only that minor carburetter adjustments are made; compression need not be altered.

As might be expected by reason of its greater weight, it burns under normal conditions with a whitish smoke and leaves slightly more sooty deposit in the cylinders than does gasolene. It is declared, however, that both of these undesirable features can be eliminated by careful carburetter adjustment and in any case they are more than compensated for by the fact that as the fuel contains a greater percentage of heat units per unit of volume it permits of the generation of greater power on slightly less consumption.

According to Burtons' patents, and an analysis of the fuel, Motor Spirit is a last and "destructive distillation" of the residue which remains after the production of lubricating oils and which nominally is styled "gas oil" or "fuel oil" and sold as such for a low price. In the distillation of crude oil there is first produced naphtha, varying in percentage according to the grade of crude oil used; part of the naphtha afterwards is converted into gasolene by further distillation and chemical treatment. After the naphtha and gasolene are extracted, the refined oil of commerce is made, after which there is produced a distillate known as "paraffin distillate," which, after being chilled and pressed for the removal of paraffin wax, is again subjected to distillation, producing various grades of lubricating oils. It is the residue from this latter product, which upon "special destructive distillation" yields Motor Spirit in paying quantities.

Thus, it may be made from any grade of crude oil; its boiling point is somewhat higher than that of commercial gasolene, which may range from 115 degrees to 350 degrees, though by reason of the fact that it actually commences to boil at a lower temperature than does gasolene there should be no difficulty whatsoever in starting an engine upon it. The final boiling point may be as high as 400 degrees, though it probably flashes when heated to about 100 degrees.

FORD CARS BECOME WHITE ELEPHANT FOR STEAMSHIP

Although Court Will Permit Their Delivery, Steamship Company Has Agreed to Retain Them—Appeal May Further Involve.

The thirteen Ford Model T's which were put into the hold of the steamship Minnehaha in New York City about two weeks ago, consigned by Bowring & Co., exporters, to New Zealand, before the Ford Motor Co. could get into court to ask that the shipment be held up because they were being shipped into the territory of Ford's New Zealand dealer, have developed into a white elephant on the hands of the steamship company, for while it agreed to keep the cars in its possession on condition that the ship be allowed to sail, despite an injunction to the contrary, the injunction has been dismissed, but the agreement to keep the cars has not been abrogated. Hence the Minnehaha is somewhere between New York and New Zealand with the baker's dozen of cars in the hold and is under the agreement with the Ford company to keep them from entering the New Zealand dealer's territory, although the court has decided that the cars may enter that island.

The tangle may be straightened out by further legal proceedings; in fact, the court this week stated it would hear argument on such a proposal inasmuch as the Ford company has announced its decision to appeal from the order dismissing its injunction. The cars in question were intended for the Chili dealer, but are claimed to have been directed improperly toward New Zealand, whereupon Ford hurriedly secured an injunction forbidding the cars to leave port; however, the Atlantic Transport Co., owner of the Minnehaha, explained that the cars were at the bottom of the cargo and that to get them out would cost $3,000 and cause a delay of 24 hours, which resulted in the agreement that the ship be permitted to sail but that the cars either be kept in the possession of the steamship company in London or be returned to New York.

Weed Finds Itself in Wrong Court.

The fact that the Q. D. Hook Co., of Washington, D. C., exhibited its cross chains for the quick repair of tire chain grips in the Grand Central Palace show in New York City last month does not give the Hook company a place of business in the metropolis, according to a ruling of the United States District Court for the Southern District of New York, which this week dismissed the case brought against the Hook company by the Weed Chain Tire Grip Co., on the grounds that the New York court has no jurisdiction over the Washington concern. This ruling will necessitate the filing of a new suit by the Weed people in the national capital. Besides the Q. D. Hook Co., the defendants were Randolph T. Warwick and Edwin S. Holmes, Jr., the latter of whom holds the patent under which manufacture was carried on. Prior to the dismissal of the suit a preliminary injunction had been granted.

Knox Files Schedules in Bankruptcy.

Schedules in bankruptcy for the Knox Automobile Co., of Springfield, Mass., which were filed in the Federal Court in Boston on Tuesday last, 25th inst., show liabilities of $1,286,409 and assets of $1,370,907. The only secured creditors are the Springfield Institute for Savings and Alice E. Aldred, whose indebtedness of $24,500 is secured by real estate. There are more than 500 unsecured creditors, a large number of them representing merchandise accounts.

The principal creditors are the administrator of the estate of Alfred N. Mayo, of Springfield, $790,000; Fisk Rubber Co., $80,473; First National Bank of Boston, $40,000, and Chicopee National Bank, $30,000. The assets include incumbent real estate to the value of $268,300, machinery, tools, stock in trade and patents to the value of $750,000 and complete automobiles to the value of $125,000.

Creditors Break into "Armored Car."

Three creditors, who claim the Bellamore Armored Car & Equipment Co., of 258 5th avenue, New York City, is insolvent, filed a petition in bankruptcy yesterday, 26th inst., against the Bellamore company in the Federal court in New York City; the petitioners and their claims, which total $569.23, are: Sulzberger & Sons Co., merchandise, $227.31; Allen W. Terry, services, $292.30; William Dauphin, merchandise, $49.62. The Bellamore company built at least one armored, burglar-proof car, designed to be used by banks, and at one time acquired a factory in Bridgeport, Conn., which later caused it all manner of litigation in which unpleasant allegements were made.

Pope's Taxicab Venture in Straits.

The Taxi-Motor Cab Co., of Boston, Mass., of which Arthur W. Pope is president and treasurer, made an assignment on Tuesday last, 25th inst., to Benjamin N. Johnson. Pope's leather and shoe finding firm, Arthur W. Pope & Co., also made an assignment, as did Pope personally. The embarrassment was caused by the maturity of about $80,000 worth of Taxi-Motor notes endorsed by Pope, who believes, however, that all creditors will receive dollar for dollar.

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SECURES RIGHT TO DESIGN OF ITS YELLOW TAXICABS

Court Denies Monopoly of Color, but Says Design of New York Company's Cabs Cannot be Imitated—Appeal as Test.

Although apparently conflicting decisions in preliminary features had been given by judges of the Supreme Court for New York county in the litigation instituted by the Yellow Taxicab Co. to substantiate its claim to the design of painting employed on its cabs, the deciding of two cases this week in favor of the Yellow company has paved the beginning of the way to a final settlement of the dispute. The two defendants in these cases, Wallace Carpenter and Geo. Rosemeier, who had painted their cabs yellow, are enjoined from colorably imitating the design of the Yellow cabs, and pending the carrying of the cases to the Appellate Division will rest the final settlement of all of the actions. The court to a certain extent forbids the Yellow company's competitors from running yellow cabs.

As was told in Motor World in November, when one judge refused to make preliminary injunctions in six cases permanent during the pendency of the actions, no company has the right to a monopoly of any one color in decorating its cabs, yet the disposition of the cases approaches the same end by a different route. Carpenter and Rosemeier are enjoined from "colorably imitating" the cabs of the Yellow company with the object of inducing the cab using public to believe their cabs are Yellow taxicabs and the matter reduces itself to a question of infringement of design, which in the Yellow company's fleet is a "Bristol orange" trimmed with black.

The competing cab owners may use yellow, but it must be so used that the cab using public can differentiate between a cab of the Yellow and a competing company. How this differentiation may be effected in one way is shown by the tactics pursued by Carpenter and Rosemeier following the order of the court that they be enjoined pendente lite, or during the pendency of the cases, from imitating the Yellow cabs. Upon agreement with the Yellow company they did not repaint their cabs, but placed upon the doors "I. T. O. A.," the initials of the Independent Taxicab Owners' Association.

With this lettering no objection was made to their operation. Similarly the cab doors might be painted with black latticework or the cabs might be distinguished in some other way, but should the design approach at all near that of the Yellow company the fight which that concern has thus far put up indicates that further litigation might follow.

Rubber Workers' Strike Weakening.

Although all the Akron tire manufacturers continue to be more or less affected, it is evidenced that the backbone of the strike of the rubber workers appears to be bending, if it is not broken. Since Monday last large desertions from their ranks are reported, though at least 10,000 still are said to be holding out.

The strikers have formulated demands for a new wage scale, which provides for an average increase of about 25 per cent., and for an eight-hour day—two hours less than at present. The wage scale demanded ranges from a minimum of 22½ cents per hour to 60 cents. The tire makers, however, steadfastly refuse to deal with either of the labor organizations which have projected themselves into the affair, and maintain that they will treat only with their individual employes.

Dunlop Secures Fabricord Rights.

The Dunlop Tire & Rubber Co., of Toronto, Can., has acquired from the Century Rubber Co., of New York, the exclusive rights to manufacture and sell Fabricord tires in the Dominion, where the tires will be known as Dunlop-Century Fabricord tires. The feature of Fabricord construction is a new method of application of the fibres of cotton fabric, the strength of the fabric being almost entirely radial to the wheel.

Consolidated to Take Wagner's Name.

Directors of the Consolidated Lubricants Co., of New York, have voted to change its name to the Wagner Oil Co., taking that title from the well-known F. J. Wagner, who recently assumed the presidency when A. R. Pardington relinquished the office. J. C. Nichols will remain treasurer of the company.

Lewis Forming His Own Engine Company.

Ralph C. Lewis, who recently resigned the general management of the Beaver Mfg. Co., of Milwaukee, Wis., is organizing the Lewis Motor & Engineering Co., which will engage in the manufacture of gas engines of all types. Lewis, however, is not ready to disclose his plans.

Studebaker Profits Increase $650,000.

According to a report of the Studebaker Corporation, of Detroit, Mich., for the year ending December 31st last, its profits from manufacturing and trading amounted to $3,342,560, an increase of $650,712. The surplus, after making all charges, amounts to $2,313,245, an increase of $659,663.

BOUGHT CHEAP TIRES BUT NOW CLAIMS POOR QUALITY

Rutherford-Stepney Suit Brings Countercharges and Airs Contract—Stepney Says Some Casings Lasted Only Ten Miles.

An effort by the Stepney Tire & Rubber Co., of New York City, to get 10,000 tires at a low price from the Rutherford (N. J.) Rubber Co., which was extensively exploited several years ago by Charles Austin Bates, once a widely known advertising expert, who proposed among other things to sell stock to car owners and permit them to buy tires at "trade" prices, evidently did not result satisfactorily, according to a suit which has been filed in the Supreme Court for New York county by the Rutherford Rubber company against its former customer.

The complainant demands $3,789.92 for tires which it claims it delivered and which were not paid for.

The trouble centers about a contract made November 22, 1911, which stipulated that the Stepney company, formerly the American Stepney Co., was to buy 10,000 tires, and the contract stated that "the tread of said tires shall be made of the same composition as that used in the manufacture of the high-grade Sterling tires made by the party of the first part, but that all other parts of the tires ordered herein shall or may be of cheaper material than that used in Sterling tires and that no guarantee of any kind is made or implied."

In modification of this contract the Stepney company submits a letter accepting the contract and stating that certain changes in construction are agreed to, but "it being understood, however, that such change is in no way to reduce the standard or wearing qualities of the cover stock."

In its answer the Stepney company makes the assertion that many of the tires delivered would not last for more than ten miles, that it went to great trouble in adjusting difficulties with its customers, that whereas the Rutherford company claims the tires delivered were worth $43,376.81 they were worth not more than $10,000, and that inasmuch as $40,836.31 was paid, the tires have been more than paid for. The amount asked is the balance—$2,540.50—and $1,249.42 expended for moulds and stencils, which latter the Stepney company claims it has not possession of and should not pay for.

The wholesale prices named in the contract range from $6.50 for 28 x 3 clincher to $20.50 for 37 x 5 clincher and quick detachable types.

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NEW COURT RULES UNCOVER MANY FORGOTTEN LAWSUITS

Cases Supposed Long "Dead" Found to be Officially "Alive"—Echoes of Earlier Days Awakened by "House Cleaning."

As a result of the new set of equity rules promulgated by the United States Supreme Court for the guidance of the lower courts and which became effective February 1st, a mighty effort is being made to clear the records of "deadwood"; the effort caused a considerable rattling of dry bones, and some not so dry, this week, when the court clerk of the District Court for the Southern District of New York, where many trade actions have been filed, published a list of over 3,000 cases which have accumulated within the last decade or more and which have not been disposed of. The publication of the list brought to many men and manufacturers within the automobile trade the information that whereas they thought they were through with certain lawsuits, these same suits still are on the court records as "alive" and the calling of the cases on near dates will bring recollections of some former famous trade fights and troubles. Many of the cases will be officially discontinued or withdrawn when brought up, and hereafter, according to the new equity rules, cases must move forward with reasonable speed or they will be dismissed.

One of the old-timers is entitled Leonard H. Dyer and Association Patents Co. vs. Acme Motor Car Co., and was brought April 5, 1906, for alleged infringement of Dyer's change-gear gate patent, No. 657,650, but since the suit was started the patents company and Dyer have dissolved relations and Dyer has entered into a new agreement with the Automobile Board of Trade, which makes further continuance of the action problematical.

More bones will rattle when the clerk sings out "Hartford Rubber Works vs. Electric Vehicle Co.," and what will become of the case is yet uncertain; it was filed December 10, 1907, when the Hartford company asked a receivership on the grounds that it had a claim of $11,785.67 against the Vehicle company, and the records show that the receiver finally turned over his holdings to a reorganization committee; but the case was never wiped off the records.

The Electric Vehicle Co. and the Morton Trust Co., as trustee, appear in another action, filed December 13, 1905, as complainants against the Hartford Rubber Works Co., this time alleging infringement of patents Nos. 750,633 and 750,838, both covering a tire, and issued to Henry G. Fisk but becoming the property successively of the Electric Vehicle Co., the Columbia & Electric Vehicle Co., the Electric Vehicle Co. and the Morton Trust Co.

Of not so early vintage is the H. W. Johns-Manville Co. vs. the Keasley & Mattison Co., wherein Johns-Manville, September 18, 1909, charged infringement of patent No. 792,901, covering a gasket, and one which the parties concerned apparently have forgotten all about is a suit filed July 7, 1909, by Edward V. Hartford, George H. Hartford and the Hartford Suspension Co., makers of Truffault-Hartford shock absorbers, against the Winton Motor Carriage Co., which company the complainants allege infringed the Trauffault frictional shock absorber patent of the reissue number 12,437. The defendants likely will ask a dismissal.

Harking back to the early days of the tire chain industry is Parsons Non-Skid Co. vs. Weed; this was the suit which the Parsons company, which originated the Parsons patent in England and secured an American grant, instituted some ten years ago against Harry D. Weed, whom it claimed was infringing the Parsons patent and which suit led to the union of Weed and the Parsons company and the perpetuation in the trade of the Weed Chain Tire Grip Co. The antiquity of the action is evidenced by the fact that the defendant, Weed, has since cleaned up something like a half million of dollars and retired, selling his Weed chain interests. This case will be terminated.

In the big collection of 3,000 "old stagers" are four cases of the Enterprize Automobile Co. against the Winton Motor Carriage Co., the Locomobile Co. of America, Maxwell-Briscoe, Inc., and the Commercial Motor Car Co. These, which are under patents Nos. 885,986 and 921,963, have practically been disposed of by the recent Dyer-Board of Trade agreement, and since the Commercial Motor Car Co. is out of business, that case likely will be ended as soon as called.

An enumeration of the trade cases involved would form a small booklet, but in addition to those already named are two by the Whitney Motor Wagon Co., one against the White Sewing Machine Co. and the other against the Prescott Automobile Mfg. Co., and some of the others are: Aerated Fuel Co. vs. Prescott Automobile Mfg. Co., Rushmore vs. Manhattan Screw & Stamping Works, American Diesel Engine Co. vs. American & British Mfg. Co., Consolidated Rubber Tire Co. vs. B. F. Goodrich Co., the same vs. Doherty, and the same vs. Republic Rubber Co., Parsons Non-Skid Co. vs. Green-Beebe-Weed Co., A. R. Mosler & Co. vs. E. M. Benford, Hartford vs. E. J. Edmond Co., and Parsons Non-Skid Co., Ltd., vs. U. T. Hungerford Brass & Copper Co. The latter suit involves the Reliance grip and is in fair way of settlement.

GOODRICH NET SALES FOR NINE MONTHS $37,500,000

On This Volume of Business Net Profits Were In Excess of $3,500,000—Assets Aggregate Ninety-eight Million.

During the nine months which ended December 31, 1912, the net sales of the B. F. Goodrich Co., of Akron, Ohio, according to figures just made public, amounted to $37,533,861, on which the net profits were $3,522,489. The statement in full follows:

Net sales	$37,533,861
Manufacturing, selling and general administration expenses	33,814,527
Net profit from operation	3,719,334
Miscellaneous income	571,845
Total income	4,291,179
Depreciation	440,852
Interest and bills payable	327,838
Net profit	3,522,489

The consolidated balance sheet of the B. F. Goodrich Co. as of December 31, 1912, follows:

Assets:	
Real estate, buildings, plant, good will, etc	$70,685,722
Investments in other companies	1,635,958
Preferred stock in treasury	2,227,117
Current assets	24,007,698
Deferred charges to operation	229,619
Total	$98,786,114
Liabilities:	
Common stock	$60,000,000
Preferred stock	30,000,000
Current liabilities	7,679,879
Reserve for contingencies	300,000
Surplus	806,235
Total	$98,786,114

Goodyear on Fictitious Stock Values.

Whatever may be the outcome of the strike of the Akron rubber workers, Frank A. Seiberling, president of the Goodyear Tire & Rubber Co., has praiseworthily placed himself on record as stating that one of its good results "has been the pricking of the bubble of fictitious values on the stocks of various corporations."

"Speculators," he adds, "had carried the value of Goodyear common stock to a basis of $465 per share ten days ago. It is now around $350, while its intrinsic value is approximately $125. Let this good work go on, and we will not have as much false reasoning when this fictitious basis of value has been properly exploded."

All of the Akron tire shares have declined in corresponding measure.

Seamless Rubber Issues Treasury Stock.

The Seamless Rubber Co. of New Haven, Conn., which makes the Bragg stitched tire, has certified to an issue of 5,000 shares of its treasury stock. The issue makes the total outstanding stock $1,000,000, of which one-half is common.

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The Week's Incorporations

Brooksville, Ohio—Brooksville Auto Co., under Ohio laws; authorized capital, $10,000; to deal in motor cars.

Norfolk, Va.—Tidewater Automobile Co., under Virginia laws; authorized capital, $15,000; to deal in motor cars.

Piqua, Ohio—Auto Commercial Delivery, under Ohio laws; authorized capital, $10,000; to operate a motor delivery.

Knoxville, Pa.—Hollis Automatic Traction Co., under Delaware laws; authorized capital, $250,000; to deal in motor vehicles.

Moose Jaw, Sask.—Canadian Standard Automobile & Traction Co., under Canadian laws; authorized capital, $250,000; to deal in motor vehicles.

Alexandria, Va. — Express Spark Plug Co., under Virginia laws; authorized capital, $200,000; to manufacture spark plugs. Corporators—C. H. Duffey and others.

Chicago, Ill.—National Tire & Repair Co., under Illinois laws; authorized capital, $3,000; to repair motor car tires. Corporators—William Erkert, E. H. Tillson and others.

Jacksonville, Fla.—Gallatin Motor Co., under Florida laws; authorized capital, $10,000; to deal in motor cars. Corporators—H. B. Philips, Harold T. Philips, Harry Botts.

Sacramento, Cal.—Owners' Auto-Tire Co., under California laws; authorized capital, $5,000; to deal in motor car tires. Corporators—H. C. Muddox, Frank Smith, W. W. Bassett.

Rochester, N. Y.—Alling & Miles, Inc., under New York laws; authorized capital, $20,000; to deal in motor cars. Corporators—Edmund M. Alling, Alice R. Alling, Milton B. Miles.

Greenville, Ohio—York Supply Co., under Ohio laws; authorized capital, $25,000; to deal in motor cars and supplies. Corporators—C. F. York, A. Z. Heller, J. H. Byard, Lillie M. York.

Saratoga Springs, N. Y.—Ross-Ketchum Co., Inc., under New York laws; authorized capital, $18,400; to deal in motor cars. Corporators—J. Arthur P. Ketchum, Norman B. Ross, James W. Northrup.

Indianapolis, Ind.—Capitol Body Co., under Indiana laws; authorized capital, $10,000; to manufacture motor car parts. Corporators—Elmer Hinshaw, Fred W. Henschen, Elmer W. Hughey.

Nashville, Tenn.—State Motor Car Co., under Tennessee laws; authorized capital, $25,000; to deal in motor cars. Corporators—W. F. Anderson, R. M. Meriges, Jr., John A. Welsdorf, John E. Shelton.

Wheeling, W. Va.—Lavender Auto Supply Co., under West Virginia laws; authorized capital, $25,000; to deal in motor car supplies. Corporators—A. B. Kennard, Jr., C. E. Lavender, R. M. Lavender.

Chicago, Ill.—International Automobile Supply Co., under Illinois laws; authorized capital, $5,000; to deal in motor car supplies. Corporators—William L. Loeffel, Mark T. Adams, William E. Stephens.

New York, N. Y.—Munnich's Garage, Inc., under New York laws; authorized capital, $500; to operate a garage. Corporators—Christopher Munnich, Elizabeth Munnich, John Munnich, all of 225 Brown Place.

Detroit, Mich.—Timken-David Brown Co., under Michigan laws; authorized capital, $250,000; to manufacture worm-drive gears and worm wheels. Corporators—Eugene W. Lewis, Herbert W. Alden, Lewis H. Paddock.

Cleveland, Ohio — Diamond Stamping Works Co., under Ohio laws; authorized capital, $35,000; to manufacture motor car parts. Corporators—J. C. Royon, Phelps Crum, H. H. Henry, M. T. Gorton, Rose L. McCarthy.

Brooklyn, N. Y.—Bensonhurst Auto Renting Co., Inc., under New York laws; authorized capital, $3,000; to operate a motor livery. Corporators—Louis Flatow, 187 So.

BIRDSEYE VIEW OF McCORD MFG. CO.'S ENLARGED PLANT IN DETROIT



Additions include a testing laboratory and a department for truck radiators exclusively. Apart from other things, the McCord factory now has a capacity of 85,000 radiators annually.

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2nd street; Harry Harrigan, Max Levy, 150 Bay 22nd street.

Brooklyn, N. Y.—Cumberland Garage Co., Inc., under New York laws; authorized capital, $25,000; to operate a garage. Corporators—Willard L. Gray, Cumberland street; Alfred Wilmarth, Marie F. Wilmarth, 626 East 18th street, New York City.

New York, N. Y.—Gotham Sight Seeing Corp., under New York laws; authorized capital, $1,000; to operate motor buses. Corporators—George Laury, 56 West 112th street; Louis Brown, 520 East 77th street; David Lebowitz, 64 East 118th street.

New York, N. Y.—Chrome Mfg. Co., under New York laws; authorized capital, $25,000; to deal in motor vehicles. Corporators—James E. Marshall, 25 West 136th street; William H. Buckley, 445 Lenox avenue; William P. Green, 21 West 134th street.

New York, N. Y.—Dann-Gorman Co., Inc., under New York laws; authorized capital, $10,000; to deal in motor cars. Corporators—Thomas F. Dann, 99 14th street, Brooklyn; John L. Gorman, 372 East 156th street; John B. Gouger, 142 West 49th street.

Changes of Capitalization.

Toledo, Ohio—Ohio Electric Co., from $250,000 to $500,000.

Detroit, Mich.—Detroit Carburetter Co., from $25,000 to $50,000.

Chicago, Ill.—Imperial Brass Mfg. Co., from $100,000 to $200,000.

St. Louis, Mo.—American Automobile Co., from $200,000 to $300,000.

Detroit, Mich.—Federal Motor Truck Co., from $100,000 to $200,000.

Recent Losses by Fire.

Ithaca, N. Y.—Lang Garage, garage destroyed. Loss not given.

Amesbury, Mass.—J. H. Leitch, automobile plant damaged. Loss, $12,000.

Norwich, Conn.—Turnbull Auto Co., building damaged. Loss not given.

Newport, N. H.—Napoleon Geoffrain, garage damaged and six cars destroyed. Loss, $10,000.

Union, Ia.—Woods Carriage & Automobile Co., garage and 20 cars destroyed. Loss, $44,000.

Greensburg, Ind.—George Montgomery, repair shop and several cars destroyed. Loss, $15,000.

Cincinnati, O.—Western Motor Car Co., 127 West 7th street, damaged by explosion. Loss not given.

Healdsburg, Cal.—Sonoma Garage and Consolidated Vehicle Co.'s warehouse destroyed. Loss not given.

PROMINENT MEN IN TRADE WHO ASSUME NEW DUTIES

Resignations and Promotions That Serve To Place Many Workers In New Places—Few Leave the Industry.

Frank M. Ridler has been promoted to the post of sales manager for the Pope Mfg. Co., of Hartford, Conn. He has been connected with the company for many years.

J. C. Austin, former chief engineer of the Regal Motor Car Co., of Detroit, has joined the Studebaker staff. He has become engineer of passenger cars under chief engineer Heaslet.

Fred W. Plumb has been appointed sales manager of the Palmer-Moore Motor Truck Co., of Syracuse, N. Y. He obtained necessary experience in the service of several of the best known dealers in Syracuse.

W. C. McElwain, manager of the Stewart-Warner Speedometer branch, of Cincinnati, has resigned that position to become Ohio representative of the Hoffecker Co., of Boston. He will have his headquarters at Cleveland.

J. T. Rose, of Washington, D. C., has been appointed manager of the Invader Oil Co.'s branch in that city. Previously he was identified with T. E. Tomlinson, general manager of the Invader company, in his earlier enterprises.

C. W. Whitston, who it is stated was one of the organizers of the Krit Motor Car Co., of Detroit, has been added to the field staff of the Keeton Motor Car Co., of that city. He will cover Eastern territory, New England excepted.

On April 1st, Glenn Buck will become advertising manager of the Ford Motor Co., of Detroit. As the Ford account has been handled by the Glenn Buck Advertising Co., of Chicago, for some time, his duties will not be strange to him.

A. J. Diefenderfer, former assistant manager of the Lozier Motor Co.'s New York branch, has been promoted to the post of manager. He succeeds W. S. M. Meade, who resigned to become secretary of the new Chandler Motor Car Co.

Charles W. Cross has been appointed sales manager of the Holly Bros. Co., of Detroit, Mich. He has been identified with the automobile trade for more than ten years, latterly in the sales department of the General Motors Truck Co.

Hugh H. Goodhart has been promoted to the post of advertising manager for the Lippard-Stewart Motor Car Co., of Buffalo, N. Y., with which he has been identified for some time. Before joining the Lippard-Stewart staff, Goodhart was a member of the Franklin advertising department in Syracuse.

Frank H. Martin has been appointed Eastern sales manager for the Stewart-Warner Speedometer Corporation, with headquarters in New York. He succeeds Arthur J. Interrieden, who recently became sales manager for the Jones Speedometer Co. Previously, Martin was manager of the Firestone solid tire department in Akron.

William R. McCulla, a specialist in carburation, has been appointed assistant research engineer for the Packard Motor Car Co., of Detroit, Mich. McCulla has had extensive experience since 1899, when his father purchased the second car that appeared in Ireland. He has been identified with the Mercedes, Renault, Napier and Rolls Royce cars.

Walter E. Holland has been appointed manager of the Anderson Electric Car Co.'s mechanical and electrical research department in Detroit. He brings with him ripe experience, having had to do with electric vehicles and storage batteries for many years. From January, 1911, to February of the present year Holland was chief electrical engineer of the Edison Storage Battery Co., of West Orange, N. J.

Panama Rubber Chooses its Officers.

W. D. Newerf, the Los Angeles tire jobber who recently organized the Panama Rubber Co., with an authorized capital of $1,000,000, has assumed the presidency of the corporation. The other officers are: W. E. McCune, first vice-president; Motley H. Flint, second vice-president; J. S. Benner, secretary; John F. Roe, treasurer. Executive offices have been opened in the Los Angeles Investment Building, but a factory site has not yet been secured. It is stated, however, that "one of the best known tire-builders in the country" has been engaged as factory superintendent, but his identity has not been disclosed.

International Re-elects Coleman President.

Reports that he would retire from the presidency of the International Motor Co., of New York, were put to rest at the annual meeting of the board of directors last week when C. Phillip Coleman was re-elected president of the corporation. F. C. Richardson was chosen treasurer, and Vernon Monroe secretary. E. C. Converse, the New York banker, retains chairmanship of the board of directors, and W. C. Dickerman the chairmanship of the executive committee. Three new men entered the directorate, viz.: William E. Corey, W. T. Graham, and T. L. Chadbourne, Jr.

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In the RETAIL WORLD

B. F. Schmidt is constructing a garage in Exeter, Cal.

Robert Bryanton is building a garage in Allerton, Mass.

H. Grote has established a repair business in Eugene, Ore.

Ralph Metzger will open a garage in Chillicothe, Ohio.

C. W. Clare proposes to construct a garage in Smithville, Tex.

Gustave Fribkle is about to open a garage and repair shop in Havre, Mont.

James J. Reynolds just has completed a concrete garage in Port Chester, N. Y.

Frank McCullen and Edward Jepson are about to open a garage in West Bend, Ia.

Mazza & Questa, dealers, in Olean, N. Y., plan the construction of a new garage.

Howard Tracy has opened a repair shop in Oshland, Ohio. It is located on Orange street.

W. H. Rattenburgh is about to erect a garage in El Paso, Tex. The site is on Missouri street.

The Black Hills Garage & Supply House, of Deadwood, S. D., is having a new garage constructed.

A new garage is being erected for H. L. Cook in Palestine, Tex. It is located on Spring street.

A new garage is being erected in Atlantic, Ia. When completed it will be occupied by Hans Thiessen.

R. K. Woodrum and Bruce Purvis are establishing a garage and repair business in Louisburg, Kan.

The F. O. Engstrum Co., of Los Angeles, Cal., is about to have a new garage erected; it will cost $30,000.

The R. P. Smith Garage in Port Arthur, Tex., has been purchased by R. E. Howland and George Wynall.

A. B. Neyhart has purchased the Sixth Street Garage in Stroudsburg, Pa. He will conduct the business.

George F. Fleet, owner of the People's Taxicab Co., in Altoona, Pa., plans to erect a garage on Beale avenue.

Campbell & Cottrill have completed a new garage in Long Beach, Cal. They are Chalmers and Maxwell dealers.

Ketchum-Ross Co. is the style of a new accessory dealer in Saratoga Springs, N. Y. J. C. Lovemoney is manager.

William Couffer is about to enter the trade in Urbana, Ohio. He will open salesrooms on South Main street.

The Souhegan Auto Co., of Milford, N. H., has opened a new repair shop and salesrooms on Nashua street.

J. M. Carmer has organized the Auto Accessories Co. in Fort Wayne, Ind. He will locate at 122 West Washington street.

R. W. Morrison has retired from the firm of Hardy & Morrison, dealers, in Fonda, Ia. Hardy & Son will be the style hereafter.

A. E. Reed, a dealer in Louisville, Ky., has established a branch of his business on South 4th street; he has the Overland line.

Morris Yingling and Michael Rice, who constitute the City Auto & Machine Co., in Latrobe, Pa., are about to build a new garage.

Ralph Schwarz has purchased an interest in the Central Motor Co., of Reading, Pa. The style hereafter will be H. B. Schwarz & Son.

W. W. Conley, formerly of Hastings, Minn., has entered the trade in Merriam Park, in the same State; he has the Pratt agency.

F. J. Rie and Ray Davis have established a tire repair business in Petaluma, Cal. They will operate as the Petaluma Tire Repair Co.

Andrew Murphy & Son, of 1410 Jackson street, Omaha, Neb., have had plans prepared for a new garage; the estimated cost is $10,000.

C. W. Deane, formerly of McCallum & Deane, in Grand Rapids, Mich., has "flocked" by himself. He has opened a garage on State street.

George E. Quay, owner of Quay's Garage in Dunkirk, N. Y., has completed a new garage and machine shop; it is located at 218 Washington avenue.

Rosenthal & Thompson, automobile and implement dealers in Redwood Falls, Minn., have dissolved partnership; William Rosenthal will continue the business.

Charles W. Kruger of Alta Vista, Kan., has purchased a garage in Peabody, in the same State; he will remove to the latter town and conduct the new business.

Clifford Caley, of Bluffton, Ind., is about to establish a garage and agency business in Huntington, in the same State; his location is in the Bender building, on Main street.

George M. Height and Theodore Bennett of Spring Lake, N. J., have sold their garage business to Timothy Hurley; the former owners have embarked in the meat trade.

W. C. Spear, owner of the Manchester (N. H.) Auto Garage, has had plans prepared for the erection of a new garage and salesrooms; the new building will be on Granite street.

Fred Yoho, formerly with the Oliver & Martin Garage in Martins Ferry, W. Va., has entered the trade for himself. He has leased a building on North 6th street and will open a repair shop.

W. E. Dehler, of Crane, Wis., has purchased the interests of Peter Herring in the Bloomer Auto Garage & Supply Co. in Bloomer, in the same State; he will make his residence in the latter town.

Harry Corbaley and Edward Allen, of Palo Alto, Cal., have merged their interests under the style Corbaley & Allen; they will deal in automobile supplies and will handle the Chalmers, Overland and Kissel lines.

E. L. Kaufman of Keota, Ia., has purchased a half interest in the Lawler Garage in North English, in the same State; the style has been changed to Kaufman & Lawler Auto Co. A new garage will be erected.

Hanson & Tyler, who distribute cars over a considerable territory in Iowa, are to remove their headquarters from Webster City to Fort Dodge; Tyler will remain in Webster City in charge of the business there.

The Boehmer-Sheridan Auto Co., of Fort Smith, Ark., has dissolved. Boehmer will continue the business and Paul W. Sheridan will operate the Arkansas Garage at North 10th and B streets. Sheridan retains the Ford agency.

G. W. Jones, former manager of the United Motor Des Moines (Ia.) Co., has purchased a controlling interest in the Moyer Automobile Co., in that city. William E. Moyer, former head of the company, died last week. The concern is Iowa agent for Krit and Hudson cars.

The W. L. Huffman Auto Co., of Omaha,

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Neb., has opened a branch salesroom in Sioux City, Ia., at 222 South Phillips avenue; Fred Nair is manager. The company has the Hupmobile agency for South Dakota, Nebraska and Iowa and the new station is to care for the business in the former State.

The Reliable Motor Car Co. has entered the trade in Salt Lake City with salesrooms at 65 West 4th street, South; it is Oakland distributer. S. C. Sherrill is president, Harry Nightingale vice-president, secretary and treasurer, and Harry Elliot sales manager.

The Osen-McFarland Auto Co., San Francisco dealers, have arranged with J. H. and M. L. McCullough to handle the company's retail business in San Francisco; they will trade under the style McCullough Bros. and their line will comprise Mitchell and Empire cars and I. H. C. delivery wagons.

G. S. Holmes, proprietor of the Semloh Hotel in Salt Lake City, Utah, and his son, Dwight L. Holmes, have entered the automobile trade; they have established an agency for Speedwell cars and trucks and Wagenhalls delivery cars at 223-25 South State street. Dwight L. Holmes also operates a similar agency in Los Angeles.

The W. D. Sweet Motor Car Co., which recently was organized in Binghamton, N. Y., has taken over the garage and repair business of W. A. Crandall at 233-35 Water street. Crandall will continue in charge of the repair shop, which is in the basement, and the first and second floors of the building will be utilized by the Sweet company for the exploitation of the Speedwell line.

The General Motor Truck Co. has been formed in Toledo, Ohio, to take over the business of the Heavy Tonnage Transportation Co., a trucking concern; the new company will continue in the old location at Michigan and Jefferson streets. The officers of the new company are: Frank M. Hackett, president; F. M. Dotson, treasurer; W. C. Prickett, general manager; directors, the foregoing and C. B. Grandy and C. O. Morton.

John G. Webber, J. A. Rose and E. T. James have formed the Auto Sales Co., Inc., in Charlotte, N. C., to handle the Studebaker line which formerly was handled by a factory branch, recently discontinued. The old Studebaker location at 222 North Tryon street will be occupied. Rose, for the past year, has been manager of the Ford Sales Co. in Asheville, N. C. James continues to stock Cadillac cars and will display them in the new company's salesrooms.

The Alliance (O.) Motor Car Co. is a new entry into the trade in that Ohio town. A garage and machine shop, 160 x 50 feet, and having a capacity of from 40 to 60 cars, will be erected. The officers are: President, C. G. Mummert; vice-president, C. G. Cline; secretary, Sydney L. Geiger; treasurer, J. O. Ellis; directors, the foregoing and Morris W. Geiger, G. K. Pritchard, S. F. Oyster, H. D. Tolerton, R. M. Scranton, G. H. Hubler and E. P. Kinney.

Americans in Canadian Wheel Company.

Backed chiefly by American capital, the Chatham Wheel Co., of Chatham, Ont., has been organized under the laws of Canada with an authorized capital of $50,000. The company will build complete wheels, including the wood parts, hubs and rims. It represents a joint enterprise of men prominently identified with the Sparks-Withington Co., the Hayes Wheel Co. and the Jackson Rim Co., all of Jackson, Mich. M. Davies, of the Hayes company, will be general manager of the Chatham plant. Among the other stockholders are William Sparks, R. H. Withington and Winthrop Withington of the Sparks-Withington Co., C. B. Hayes of the Hayes Wheel Co., O. W. Mott and C. B. Williams of the Jackson Rim Co., and M. V. Chaplin of the Chaplin Wheel Co., of Chatham, Ont.

Blakeslee Assumes Lansden Management.

George E. Blakeslee, one of the veterans of the industry, who has been identified with the Lansden Co., of Newark, N. J., practically since its inception, was elected vice-president and general manager on Monday last, to fill the vacancy caused by the resignation of W. L. Case, who, it is stated, has disposed of his holdings and will return to his practice as a consulting engineer. Originally Case was president of the company, but he gave way to R. S. Holtz, of Chicago, whose participation in the company's affairs of late, however, has been largely of a nominal character. In September last, John M. Mack, of Allentown, Pa., former head of the Mack Motor Truck Co., became chairman of the Lansden executive committee and took over many of the president's duties.

"35%" Beats Rubly a Second Time.

Because Holmes Jones, attorney for Wm. Rubly, a grease gun manufacturer in Tuckahoe, N. Y., was not on hand when the suit against Rubly by the 35% Automobile Supply Co., of New York City, was called in the Supreme Court for New York county this week an inquest, or, in lay language, a one-sided trial, was taken with a resulting judgment of $2,474.95 for the "35%"; the suit was based upon an advertising contract whereby Rubly was to exchange $3,360 worth of grease guns for advertising in a monthly circular gotten out by the 35% company, and the claim was that he failed to live up to the contract. In an earlier stage of the suit the "35%" secured judgment for $2,383.30, but Jones carried a point to the Appellate Division and it was only this week that the matter was again brought to a head in the lower court. The present verdict, which is slightly larger than the first one, includes interest and certain costs.

King Reincorporated with $200,000.

Artemus Ward, of New York, who several months since purchased the King Motor Car Co., of Detroit, and of which he is the three-quarter owner, has reincorporated it, under the laws of Michigan, with an authorized capital of $200,000. Ward himself will figure merely as a director of the company, of which his son, Artemus Ward, Jr., is vice-president. J. G. Beyerline is president, and F. A. Vollbrecht treasurer. The other directors are T. A. Bollinger and T. P. Chase, of Detroit.

Work Begun on Delion Tire Factory.

The Delion Tire & Rubber Co., of which R. S. Peale, of New York, is president and which was incorporated about four months ago under New York laws, has acquired a factory site in Hamilton township, near Trenton, N. J., on which it will at once erect a modern tire building plant. It will be a three-story brick and steel structure, having a frontage of 258 feet. It is expected that the work will be completed about May 1st.

Foreign Service System for Splitdorf.

Oscar J. Rohde, treasurer and general manager of the Splitdorf Electrical Co. of New York, which maintains a New York branch and service station for the Splitdorf Electrical Co., of Newark, N. J., sailed to Europe on Thursday last, where he will establish a system of Splitdorf service stations, with London as headquarters. He took with him four of the factory experts.

McGraw Becomes $1,000,000 Corporation.

The McGraw Tire & Rubber Co., of East Palestine, Ohio, which heretofore has been a Pennsylvania corporation, has taken out a new charter under the laws of Ohio. The authorized capital of the new corporation is $1,000,000. When additions and improvements now in progress are completed, it is stated that the McGraw plant will have a capacity of 1,500 tires per day.

Gauge Company Reorganized and Renamed.

The National Gauge & Register Co., of La Crosse, Wis., an outgrowth of the Hans Equipment Co., has been refinanced and reorganized and the style changed to the Hans Motor Equipment Co. A $50,000 factory building is now being erected in La Crosse which will permit of a largely increased output of gasolene and oil gauges, and all other gauges.

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TWO MEANS OF REDUCING FUEL COSTS.

Having fully aroused them to the urgency of what has come to be known as the gasolene situation, and being intent on discovering future sources of supply, Motor World repeats to automobile manufacturers that two avenues which lead to a considerable measure of relief remain wide open. We refer to a change of carburetters on particular brands of cars, and to the use of one or another of the many atomizers, auxiliary air valves or other so-called gas-savers which are so numerously available.

Why so many car manufacturers will persist in the use of carburetters that are not only wasteful of fuel but which actually unfavorably affect the power and performance of their vehicles is almost beyond comprehension. That many of them are doing so is abundantly proven by the experience of individual purchasers of their cars who, on their own account and at their own expense, have tried other carburetters—possibly not so well or so widely known—with results that have been not short of remarkable. In several known instances, the saving in fuel alone has more than paid for the change of carburetters.

But whether or no carburetters are changed, it is beyond cavil or question that very many of the so-called gas-savers have demonstrated that they actually do save fuel, and in quantities ranging from 20 to 40 per cent.

With such remedies immediately available, why car manufacturers should fail to apply them is not short of astounding. The economy of car operation is a selling point of no small magnitude, and the manufacturer who believes, or fancies, that the cost of gasolene is of small consequence to anyone able to afford a motor car is sadly deceiving himself. Within the last month we have heard two men whose resources are well above the million mark rail at the price of gasolene.

The situation is one in which the price of carburetters, or personal predilictions for a particular carburetter, should not be permitted to obtain, it is also a situation which offers rich opportunities to dealers. Few, if any of them, have exploited economical carburetters, or gas saving devices, as they are capable of being exploited. For no owner of an automobile will refuse to listen to anything which promises a reduction of his gasolene bill.

FOR DEALERS WHO LOOK FAR AHEAD.

Of course there are not yet enough of them to go around, and it probably will be several years before motor plows and other motor-propelled agricultural implements of the one-man variety are generally available; but, meanwhile, it is the better part of wisdom for those dealers who have to do with automobiles, particularly in rural districts, to follow closely the development of such implements preparatory to laying hands on them in a commercial way immediately the proper moment arrives.

There is every reason to believe that, sooner or later, the manufacture and sale of gas-propelled plows suitable for use on the average farm will attain gigantic dimensions, and, with the subsidence of the fuss and fireworks which has attended a large part of the automobile industry, the automobile dealer probably will find need for goods that will fit into his scheme of things. Motor plows and the like will very happily fill the bill.

It may be argued, of course, that the established implement dealer naturally will fall heir to such trade, but the field is an open one and there is every reason why the men who have to do with gas engines in motor cars and motor trucks can and should rightfully lay claim to agricultural implements and everything else propelled by gas engines.

INTRODUCING MR. BREDENBECK, "HERO."

Let the name Bredenbeck go thundering down the halls of time! It is not a particularly poetical name but the man who possesses it has done a truly wonderful thing. He is a member of the New Jersey legislature and he actually has introduced a bill providing for the registration of horse-drawn vehicles.

The Bredenbeck bill would require a registration fee of $1 for each vehicle drawn by one animal, $2 for each vehicle drawn by two animals, and an extra dollar for each additional animal.

Of course, the measure will never pass—horse owners object even to the life saving legislation requiring them to display lights on their vehicles—but it does not alter the fact that Assemblyman Bredenbeck deserves to have his name written somewhere in a hall of fame.

Despite its hopelessness, the Bredenbeck bill is an indication of an awakening to that sense of equal and exact justice which is supposed to prevail in all legislative houses.

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BOSTON BORROWS FROM BABYLON FOR ITS SHOW

Famous Hanging Gardens for Grand Hall and Another Kind of Garden for the Rest—There'll Be Waterfalls, Too.

The New York show—either of them for that matter—nor yet the Chicago show will have anything on the Boston function which is scheduled to open its doors March 8th and keep them open till the 15th, for pleasure cars, and from the 19th to the 25th for commercial vehicles, in the matter of decorations at least. For the artist has gone way back into the archives of history for his motif and if everything goes well, Grand Hall in Mechanics Building will be transformed into a semblance of the Hanging Gardens of Semiramis at Babylon, even to the twinkling waterfalls and the mosses and the palms and everything else that went to make that famous garden spot one of the seven wonders of the world.

It is said that the Babylonian king of the time had shekels galore with which to satisfy the cravings of his wife or wives as the case may be. There must have been some truth in the rumor if the original gardens looked anything like Grand Hall will look when the decorators get through with it. The main floor scene will be one of a huge tropical garden with sure enough palm trees from the Bermudas (25 feet high, measure 'em), and mosses and other equatorial flora with unpronounceable names tastefully disposed between terraces, which, according to the artist himself, are an exact replica of the original Babylonian period. The names of exhibitors are to be blazoned from illuminated glass "turrets," and it is expected that the waterfalls (two of them) will do nothing to dampen the admiration of visitors. Also, the rear wall is to be hidden by a tremendous mural decoration from the brush of no less a person than Walter Burridge; its title is "Nebuchadnezzer's Tribute to His Median Bride," and it is said that it is all that the name implies.

Exhibition Hall is to be a garden, too—a "Garden of a Century Ago," with its old-fashioned flowers and white picket fences serving to mark off exhibitors' spaces. The walls, of course, will be covered with paintings and papier mache and a whole lot of other things that will be pretty even if they are unnamable. Down in the basement of Mechanics Building the decorative scheme will not be so elaborate, though it will be none the less effective in hiding ugly beams and supporting columns. They will be covered with a material suggesting greenish marble and the whole will be set off with festoons of electric lights of nearly every color in the rainbow.

Rubber Falls Below $1 a Pound.

For the first time in five years, the previous low mark of 67 cents being recorded in 1908, the price of crude rubber has declined below $1 a pound. Lack of demand, due partially to the strike of tire workers in Akron, and the recent failure of two important and well-established rubber trading firms—the New York Commercial Co. and the George A. Alden & Co. of Boston, Mass.—are given as the cause of the decline. Since the first of February, when upriver fine Para was quoted at $1.02, the prevailing price has been $1, until the 16th inst., when a gradual slide which brought the price down eventually to 96 cents, where it now rests, was commenced. The price has been gradually declining since the furore of 1910, when it bounded up to $3.10.

Receiver for "Dead" Truck Company.

Harry Unger has been appointed receiver for the Braun-Sautter Motor Truck Co., of Newark, N. J., which, although organized in 1910 with an authorized capital of $100,000, made no substantial progress. Business was begun in the plant in Newark but, as only $2,800 of the capital stock was paid in, financial embarrassment quickly ensued, and as a result, the factory was shut down about a year ago. The application for a receiver was made by Mrs. Alice Hanauer who, as the holder of a second mortgage, sued on her bond, the first mortgage having been foreclosed without yielding her anything. Her suit resulted in her obtaining judgment for $5,871.60, plus $40 costs.

S. A. E. to "Look Into" Tire Sizes.

For the purpose of organizing, and to hear the views of representatives of a majority of all manufacturers of pneumatic tires, wheel rims and steel bands on the propriety of materially reducing the number of tire sizes in use at present and on several other suggested alterations, the committee appointed at the annual meeting of the Society of Automobile Engineers will hold a meeting in Cleveland, O., on March 12th. Henry Souther is chairman of the committee.

U. S. Motor's Note Bothers a Bank.

The receivers of the United States Motor Co. and the Maxwell-Briscoe Motor Co. have entered suit against the Citizens State Bank, of New Castle, Ind., to recover $10,000 alleged to have been taken in payment for a note over which a dispute has arisen. The note was issued by the United States Motor Co., endorsed by the Maxwell-Briscoe Motor Co. and was purchased by the bank.



February 22-March 1, Brooklyn, N. Y.—Brooklyn Motor Dealers' Association's annual show in the 23rd Regiment Armory.

February 24-March 1, Omaha, Neb.—Omaha Automobile Dealers' Association's annual show.

February 24-27, Kansas City, Mo.—Kansas City Automobile Dealers' Association's annual show. Commercial vehicles only.

February 24-March 1, Paterson, N. J.—Second annual show of the Paterson Automobile Dealers' Association.

February 24-March 1, New Orleans, La.—Annual Show of the New Orleans Automobile Dealers' Association.

February 24-March 1, Memphis, Tenn.—Memphis Automobile Trade Association's annual show in the Memphis Auditorium.

February 24-March 1, St. Louis, Mo.—St. Louis Automobile Dealers' Association's annual show in the Coliseum.

February 24-March 1, Cincinnati, Ohio—Third annual show of the Cincinnati Automobile Dealers' Association in the Cincinnati Music Hall.

February 25-28, Topeka, Kan.—First annual show of the Kansas Motor Show Co.

February 25-March 1, Syracuse, N. Y.—Syracuse Automobile Dealers' Association's fifth annual show in the State Armory.

February 26-March 1, Fort Dodge, Ia.—Second Annual show of the Fort Dodge Dealers' Association in Armory.

March 3-8, Pittsburgh, Pa.—Pittsburgh Automobile Dealers' Association's show in Duquesne Garden.

March 3-15, Des Moines, Ia.—Des Moines Automobile Dealers' Association's fourth annual show in the Coliseum. First week pleasure cars; second week trucks.

March 8-15, Boston, Mass.—Boston Automobile Dealers' Association's annual show in Mechanics' Hall. Pleasure cars only.

March 10-15, Dallas, Tex.—Annual show of the Dallas Automobile Dealers' Association in the Fair Grounds Coliseum.

March 19-25, Boston, Mass.—Boston Commercial Vehicle Association's annual show in Mechanics' Hall.

March 24-29, Indianapolis, Ind.—Indianapolis Automobile Trade Association's show.

March 24-29, Watertown, N. Y.—Annual show of the Watertown Automobile Dealers' Association in the State Armory.

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ONE-MAN GASOLENE PLOW DESIGNED FOR MANY TASKS

Parker Implement Grinds Feed and Sprays Trees as Well as Turning Sod—Employs Two-Cylinder Air-Cooled Motor.

Evidence that the day of the one-man gas plow is not far removed continues to accumulate. So far as known only one automobile manufacturer of prominence has seriously considered the subject, but that many independent inventors are cudgeling their brains is undoubted and that their efforts are gradually developing a practical implement is equally certain.

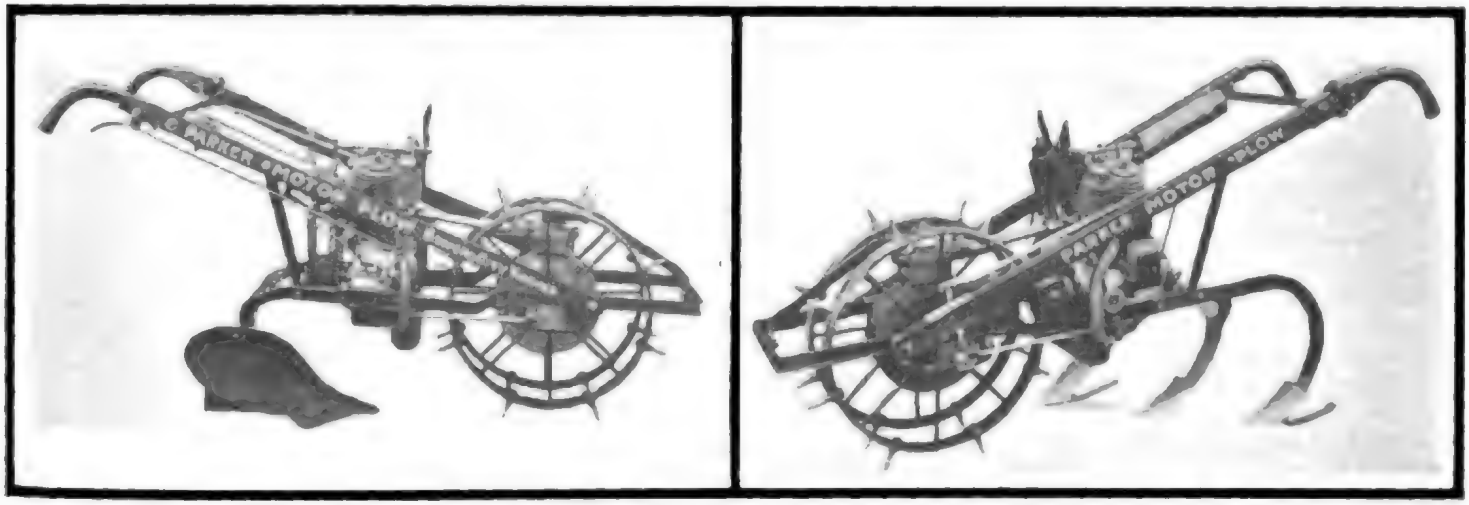
The latest device of the kind to be placed on the market is the product of Parker Bros., of Bedford City, Va., and that it was no "accident" is indicated by the fact that it has been in course of preparation for upwards of three years, during which time some 12 different models were constructed and discarded before the present perfected version, shown by the accompanying illustrations, was evolved; and that it is a remarkably simple and attractive implement and one well adapted to the ends in view is not to be gainsaid.

Like other implements of its kind, the Parker plow is designed to be a good deal more than scratch the soil. It is designed not only to break the land with either an ordinary plowshare or a disc, but to mow it, rake it, plant corn, cotton or peas, etc., and to cultivate it as well. And despite this fact, the machine is comparatively light; it weighs 350 pounds complete, though by reason of the careful balancing only 65 pounds need be lifted in turning at the end of a row. As the machine is small, it is pointed out that it can be used to advantage in orchards where overhanging branches ordinarily would interfere with the operation of the usual horse-drawn equipment.

For power, the Parker plow relies upon a twin-cylinder, air-cooled engine nominally rated at nine horsepower. Like a motorcycle engine, its cylinders are set to form a V and cooling is effected with the aid of a fan driven by belt from a large pulley at the rear. The pulley, by the way, is made for a wide, flat belt to permit of the engine being used to run any of the multifarious farm apparatus normally operated by horse power. Thus the plow is calculated to earn its keep in the farmyard as well as in the field. The engine is set transversely in the "chassis," if such the body portion of the plow may be termed. Ignition is by high tension magneto.

From the engine, power is transmitted to the tractor wheels through the intermediary of a shaft and two universal joints, the gearcase being located between the two tractor wheels, which are steel and are equippepd with great spikes to ensure traction. That the operation of the plow is as easy as the operation of a horse-drawn plow, if not easier, is revealed by the fact that without letting go the handles the engine may be throttled or speeded up or thrown in or out of gear simply by moving the fingers, levers being provided for the purpose. Incidentally, a reverse gear is provided to assist in getting the plowshare out of "sticky" ground at the end of a furrow, or to release it from under a boulder.

It is in orchard work, for plowing under limbs of trees and in restricted places hitherto forbidden ground to horse-drawn equipment that the Parker plow is calculated to get in its most effective work, for, it is pointed out, the whole equipment is so small and so easily handled that there is little danger of "barking" trees, less danger of "treading" on crops already planted, and no danger of breaking low hanging branches. Included in the attachments that go with the plow are turning points for breaking land; a seeder for planting corn, cotton or other seeds, dropping them in rows or hills; cultivators, including a disc harrow, weeders, listers, etc. A spraying attachment, for spraying two rows of trees at a time, and consisting of a tank and pump to be fastened between the handels, also may be applied. For grinding corn, or other feed, or for operating a churn or a threshing machine, it is a comparatively simple matter to slip a belt over the pulley provided for the purpose when power and to spare is available.



TWO VIEWS OF THE PARKER GASOLENE AGRICULTURAL IMPLEMENT

Putting a Stop to Smoking in Garages.

There is at least one chauffeur in New York City who will not smoke within the confines of a garage again for some time to come, and if the lesson conveyed by his arrest at the instigation of Fire Commissioner Johnson is as efficacious as it is hoped it will be, few others will care to risk the seduction of the fragrant weed unless they are out in the open. The chauffeur in question was fined $20 in the police courts, the technical charge being violation of Section 1,539 of the Penal Law, which prohibits smoking in any garage whether it be private or public. Indicating that the letter of the law is being strictly enforced, 12 other chauffeurs whose guilt was discovered by a squad of firemen in civilians' clothes sent out to collect evidence, have been held for trial in Special Sessions. So far, the activities of the Fire Department have been confined to Manhattan, but they are about to extend to the other boroughs.

Hudson Pledges $100,000 for Highway.

The Hudson Motor Car Co., of Detroit, Mich., has pledged $100,000 to the fund for the Ocean-to-Ocean highway projected by Carl Fisher and J. A. Allison, of Indianapolis. The amount, it is stated, represents one per cent. of the Hudson gross earnings for one year.

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WIDE-AWAKE MERCHANDISING In the Motor Trade

CREDIT SYSTEM TO HOLD TRADE

Credentials That Induce Tourists to Patronize a Chain of Stores—How the System Is Carried Out.

The Chanslor & Lyon Motor Supply Co. of Los Angeles, Cal., which maintains branch stores at Fresno and San Francisco, Cal.; Portland, Ore.; Spokane, Wash., and Seattle, Wash., is a live merchandiser of automobile supplies. The members of the company are not only keen on making new customers, but when they get a motorist's trade they seek to keep it.

As is well known, California is a great State for automobile touring, and this applies, in a modified degree, to most of the Pacific Coast States. With many of their customers continually on the move, it is not wholly strange that Chanslor & Lyon should develop a plan by which they manage to control and hold this trade. To do so their touring customers are provided with the following card addressed to "The Chanslor & Lyon Stores" which entitles the holder to any desired credit at any of them.

No..... Issued by.....Branch

To "The Chanslor & Lyon Stores"

Please extend Mr..... the courtesy of your best attention and grant him desired credit, charging his purchase thru this house.

.....
Manager.

Car..... Date.....
(Good for one year only)

State License No.....

(Void if mutilated or changed in any way)

These cards, which are numbered serially, are issued by the home office and by managers of the various Chanslor & Lyon branches. For proper identification the name of the tourist is given and also the make of his car and its license number. As will be noted by a reading of the card, not only is the holder of it to be granted credit but "the courtesy of your best attention." Thus when a motorist is thinking of touring, for example, from Los Angeles to San Francisco, one of the first things he thinks of is his Chanslor & Lyon card. Should he discover on the way that he is likely to need additional supplies to complete his tour, the chances are ten to one that he will, if possible, defer purchasing till he reaches the Fresno or San Francisco store. Here he presents the card to the manager, who gives him every attention, extends him credit, charges the account in the tourist's name to the Los Angeles headquarters and sends him on his way rejoicing. Should he decide to pursue his tour still further northward he knows that there are Chanslor & Lyon stores in Portland, Seattle and Spokane where his card will secure for him similar careful attention.

It will be readily seen that this "card system" is of a very practical sort that makes a decided appeal to the tourist and gives Chanslor & Lyon a merited grip on business that otherwise might be diverted.

KEEPING RECORDS OF GAS TANKS AND THE VALUE THEREOF.

Prest-O-Lite tank thieves are busy, especially in the larger cities, where detection is more difficult and means of disposing of tanks comparatively easy. This suggests to the thoughtful dealer an opportunity to serve his customers.

Each Prest-O-Lite tank is numbered serially. When you make a sale have the purchaser's name and address entered opposite the serial number of the tank bought. It takes only a few seconds' time and the Prest-O-Lite company furnishes properly accredited representatives and dealers with blank books, specially made for the purpose, free of charge.

The next step is to tell the customer why you want his name; that it is for his protection; he can come to you any time and get the number of the tank in case it should be stolen; this gives him the correct idea—namely, that you are out to protect his interests—and he will likely come again.

What have you got when you are through? You have a list of names that, if correctly kept, is exceedingly valuable to you. Every one of them is a live owner of a machine. Everyone of them has purchased something from you, therefore is a customer. Everyone has had contact with your garage and its methods, and, as a dealer-merchant, you can cash in on this list in great shape if you wish. Follow up each name on the list three weeks after tank or refill has been sold, reminding that it is about time to have tank changed. That will prove one source of profit; you will not get all to-day, but you will get some, and those that you do get will probably leave you a profit beside paying for the cost of advertising to those who do not buy.

Then, to make the list still further an asset, you can not only circularize them on cars but on oils, gasolene, polishes, repair service, tires, and many other items you find it profitable to push. And right here it is wise to recall the slogan of the modern automobile dealer-merchant—namely, that "It pays to sell the automobile owner as many things as possible—at a profit."

KEEP SHOW WINDOWS CLEAN.

At the very times when it is hardest to keep windows clean and bright is when it pays most to have them clear as crystal, for it is then they stand out sharp and clear in contrast with the smoky, mist-covered windows of the ordinary salesroom. One dealer who makes a practice of having windows washed once a week in ordinary times, doubles this dose during these doubtful months, and after two years' carrying out of this plan is thoroughly satisfied with the profitableness of it.

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AWAKE ADVERTISING WORLD

TELLING CAR TRUTHS TERSELY

How It Operates to Lift Advertising Out of the Common Rut—Brevity and Consistency Essential.

When the average man sits down to write an advertisement, the only fit comparison is the average committee of one appointed to draw up resolutions for "our deceased brother." One by one he enumerates the virtues of the car until he gets a long list of them. Then all are strung together, a picture of the car placed at the top, price on the right hand side up in the corner, signature at the bottom, and lo! the advertisement is written.

After it is set up maybe a proof is submitted and, while he looks it over, the writer smiles at himself as he wonders whether or not the public will "fall for it." The salesman peeping over his shoulder smiles too; he is thinking of what an easy berth he would have if the car was worthy of all those high-sounding expressions. He has never seen any car yet that deserved them all, and he never expects to. But—it's only advertising, and the other fellow is doing the same thing.

Honesty as a "Different" Method.

That's the point! The other fellow is doing the same thing! Let him do it. But you do it differently! Instead of running advertisements that you know are full of moonshine—instead of trying to equal the impossible claims of someone else, tell your own story sincerely, truthfully, honestly. Build a reputation for saying nothing in your advertisements that will not be backed up by the car itself. That will take your "copy" out of the common run instantly and surely.

The idea of an advertisement is to create a favorable impression in the mind of the reader that will cause him to investigate and to buy. In other words, your advertisement should be doing precisely what a good salesman does—establishing a correct, sound idea of the value of the car you are selling in the mind of the reader.

What will do that? The truth about your car. If the truth about the car you are selling will not do it, then it is foolishness to waste time advertising that particular car. Stick to the truth. Tell what you know will interest purchasers. Tell it straight from the shoulder. Emphasize one or two points at a time. Use enough space to tell your story, and make your advertising campaign regular and consistent.

THE WAY TO REACH OUT FOR ACCESSORY BUSINESS.

The live-wire accessory merchant is the one who takes advantage of every circumstance of time, place and weather, and instead of calmly sitting down and waiting for business to come to him, reaches out for it and compels it to come in. He uses as a basis for his argument the completeness of his service and the fairness of his prices, and then to show that he means what he says, he quotes a figure on some standard article of popular consumption.

Weather and Accidents that Help.

Weather to such a man is not a source of anxiety but a source of business. He studies the maps sent out by the United States Weather Bureau and plans accordingly. He has his window signs made and perhaps prints several thousand postal cards and sends them to a mailing list of car owners. On such cards he makes a complete proposition, quoting prices for various sizes of the article offered, and states that his catalogue, sent on request, gives similarly fair prices on the whole range of automobile accessories. He backs anything and everything he sells with a guarantee of satisfaction or "your money back."

He watches the records of accidents and discovers their causes. Lack of chains, lack of non-skid tires, lack of proper signalling devices, poor lights, or whatever the cause was, and draws a moral from it with which to make a pointed campaign for the merchandise he sells. He can sell only one thing at a time, but in making that sale he knows he may create a customer for many other articles in his stock. And therefore he is more than ordinarily anxious to make the initial sale.

KEEPING DEMONSTRATING CARS TUNED UP.

Is your demonstrator tuned up and ready for the business? Or will you have to explain to the prospect that in "regular models the springs don't squeak; the bodies don't rattle, and the gears do not make that uncanny noise," and so forth? In a word, will you have to explain to the prospect the queer fact that you are showing him one thing but trying to sell him another? Doesn't it seem odd that anybody should even think such a situation could arise? How silly you would think a typewriter salesman who tried to sell the latest model by demonstrating with a last year's left-over or used model! It is more than likely you would tell him to "go take a jump in the lake" or do some equally uncommercial thing. And yet, are not many automobile dealers employing selling methods just as harmful to themselves?

TRIUMVIRATE THAT MAKES SALES.

Dynamic force is what the word artists call that otherwise indefinable something that makes other men know you are there. Sometimes it comes from energy; sometimes from abundant health; sometimes from enthusiasm; often from a combination of all three qualities. Like Josh Billings's flea, "when you put your finger on it it isn't there." But if you have it the others know it—and that's all that's necessary.

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CAMPHOR AS A FUEL "DOPE" WILL MAKE A SMELL AT LEAST

But is not Good for Anything Else, Says Standard Oil Expert, Despite Contrary Claims—Its Possible Effects.

The methods of "doping" gasolene, either to obtain greater power or greater mileage or some such other desirable feature, are legion. The dangers of picric acid and ether are fairly well known and, though they still are advocated by a small and select clientele of motorists who reck little of possible damage — and not infrequently wreck their cars as well—with the glamor of speed, or power, or more miles per gallon of fuel leading them on, these adulterants are, as a rule, left the one to the chemist and the other to the physician, which is at it should be. Also, chlorate of potash has been advised by the ill-advised as a power producer of marvelous strength — despite the apparently inconsequential fact that it is insoluble in gasolene! Next!

It is, briefly, and pungently and oderiferously, camphor. Just plain gum camphor, made familiar by solution in alcohol and application by means of suitably constructed "nose bags" to the human proboscis as a means of alleviating the common or garden variety of "cold in the head." It is said to be very good for a cold—that is, a cold in the head; though its beneficial effect on a cold motor is problematical. Still, one motorist claims that by adding the almost infinitesimal portion of one ounce of gum camphor to each five gallons of "gas" his motor can be made to "behave itself" very much more soberly with regard to its voraciousness for fuel, but with a vivaciousness withal that is alluring, to say the least. Twenty per cent. greater mileage is what he claims for the use of camphor in the fuel, to say nothing of the ability to climb hills on high gear that could not be climbed on high gear without the juice of the Cinnamomum Camphora, which is Latin for camphor tree; also, he can start his motor very much more easily with it than without it. Wherefore, he uses it steadily, and he says it does not soot up the plugs a little bit.

Just wherein lies the efficacy of the fragrant product it is difficult to foresee. According to text books, the chemical symbol for camphor is $C_{10}H_{16}O$, which may or may not mean something to the layman unversed in such things. For his elucidation be it noted, therefore, that it signifies that camphor is proportioned of 10 atoms of carbon to 16 atoms of hydrogen and one atom of oxygen. From which it appears that the carbon content is fairly high and that in burning it might increase power and might result in a sooty deposit.

However, a "man higher up" in the Standard Oil Co., when asked the probable effect on the fuel of the addition of an ounce of camphor to five gallons of gasolene, laconically answered: "Nothing, except that it might create an infernal smell." He added: "Even if the addition of camphor would decrease consumption and increase power, which is not at all likely, such a small amount could have no effect of the kind—it could not increase power nor cause a deposit, for the amount is too small."

Electric Vehicle Aids Surgical Operation.

It would not appear, at first thought, that any direct connection existed between automobiles and modern surgery—except



BORLAND ELECTRIC IN HOSPITAL SERVICE

where the automobile has figured in an accident with a surgical sequel, or helped surgeons quickly to reach the scenes of accidents. A very close connection recently was established, however, between an electric motor car and an operation that was performed in Chicago.

A noted New York surgeon, who had gone to Chicago to superintend an operation of which he has made a specialty, found that the hospital where he was to work was without the direct current that was required to drive a small circular saw for cutting bones—an instrument that was of primary importance in the operation in question. As there was not time for the installation of a converter to change the alternating current, which was supplied to the hospital, to direct current, the surgeon got an inspiration and sent out a hurry call for an electric automobile. The Borland-Grannis company sent up one of its machines, which was drawn up to the curb in front of the hospital and a long cable run from it and led through an upper window into the operating room at the top of the building.

MULTIPLYING THE USES OF SOME COMMON TOOLS

How One Tool Sometimes Can Be Made To Do the Work of Two or Three—Little Suggestions and Kinks.

It is quite true that the best work usually can be done by using tools for the purposes for which they were intended. A nail can be driven better with a hammer than with a monkey-wrench; a hole can be enlarged better with a drill or reamer than with the tang of a file; and a scriber is better to "mark off" with than the point of a divider leg. Nevertheless there are times when work must be done and, furthermore, must be done with tools not intended for the purpose. At such times a knowledge of what can be done with the material at hand is valuable.

Take the hack-saw, for instance. It is good not only for sawing up metal, but makes a pretty good slotter. If a wider slot is needed than can be made with a single blade, two blades can be put in together, when the slot will be twice as wide as if only one blade were used. Even more than two blades can be used in some frames, if a still wider slot is needed. Another thing that can be done with a hack-saw is to cut grooves around the shanks of bolts or pins, and it is on record that even a rough thread has been cut with the same useful tool.

In the absence of a center-punch a serviceable "pop-mark" can be made with the corner of a cold chisel. A wide-bladed screwdriver with the edge ground sharp and square and smooth makes a fair scraper for soft metal, if it is of fairly decent steel. A hand vise can often be improvised with the aid of a pair of pliers and an iron ring, placing the article to be held in the jaws and squeezing the handles together by forcing the ring tightly on. A pair of pliers with very rough-milled jaws sometimes can be used to cut down the end of a soft metal rod by gripping the rod with the pliers just hard enough so that the pliers will not hold but will move when forced, scraping the metal off. A coarse-cut file will put a fairly good milled edge on a brass or copper blank rolled under it on a board. And so on, ad infinitum.

Making Square Act as Spirit Level.

A common square can be made to act as a very accurate level if a spirit level is not at hand. Set the square on the surface to be leveled and hang a plumb-line along the vertical edge of the blade. When the line and the edge are perfectly parallel the surface under test is level.

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REILLY HEARS A CLOCK-WATCHING EXPERIENCE

Sales Manager Relates the Story of a "Strike" for Over-Time Pay—Shock He Received When He Found Himself in Debt to Employer—Reilly's Observations.

"What's become of Rawlins?" asked Reilly, as he dropped into a chair next the Sales Manager's desk. "I haven't seen him around here lately."



"HE ISN'T WORKING FOR US ANY MORE," SAID THE SALES MANAGER

"He's gone," tersely answered the Sales Manager.

"You're a satisfying son-of-a-gun!" responded Reilly. "I was able to guess that much, but in the largeness of your intellect I thought you might condescend to let me know why he went. You know you thought he had the earmarks of a wonder."

"Wonders" that Don't Pan Out.

"That's true; but even wonders sometimes pan out badly."

"Well, open up and tell us what was the matter with him."

"Oh, he proved to be one of the clock-watching sort," rather testily answered the sales manager, to whom the subject appeared not wholly agreeable.

"Didn't he do the work he was hired to do?" asked Reilly.

"Y-yes," slowly responded the Sales Manager, "I guess he did; the trouble was that he was too anxious to stop right there. Spending an hour or two over-time got on the young man's nerves, and when I discovered it my good opinion of him began to shrink. I haven't a great deal of use for men who feel that they are paid to do only so much and no more. In fact, Rawlins disappointed me so greatly that I don't like to talk about him."

"Oh, very well; then don't talk about him," exclaimed Reilly. "The only reason I pressed the subject was because when you hired Rawlins you so gleefully shared with me your belief that you had unearthed a 'find.'"

Cleverness Directed the Wrong Way.

"I guess that's what makes me feel so badly," responded the Sales Manager. "He was one of the brightest chaps with whom I have had to do in a considerable period; in fact, he proved so bright that when he had put in a few hours after the whistle blew he came to me and asked if we did not pay for overtime. He was so cool about it that he almost took my breath away and I lost faith in him from that moment. The answer I gave him was evidently one that he did not expect, but I tried him out for another week and once purposely required that he remain after office hours to finish a small job on which I needed assistance. The look on his face reflected his thoughts and—well, he isn't working for us any more; that's all."

"I wouldn't have a man like that around my place, either," earnestly declared Reilly. "A clock-watcher is a drawback to any establishment. The man who isn't willing to do a little more than he is paid to do never climbs very high."

Tilted back in his chair and twiddling his thumbs, the Sales Manager for several moments gazed reflectively at the blank wall.

"Reilly," he finally said, in a semi-confidential tone, "can you believe that at one time in my career I came near being a clock-watcher?"

"I'm ready to believe almost anything of you," quickly responded the little dealer, with a twinkle in his eye.

"Well, it's true," said the Sales Manager, paying no attention to the banter in Reilly's tone, "and it taught me a lesson I never forgot. I think it was the turning point in my life."

A Lesson in Clock-Watching School.

"Well, out with it! What's the answer?" queried Reilly.

"It was all of 20 years ago and long before automobiles were thought of," went on the Sales Manager. "I had a good job; I liked my work; I was getting a good salary and the boss apparently thought well of me. He had raised my pay twice in the course of the two years that I was with him.

"The store kept open till eight o'clock



"I WOULDN'T HAVE A MAN LIKE THAT, EITHER," DECLARED REILLY

two evenings each week during the winter months, and I took my turn on the 'evening watch,' as we called it. I accepted it as a matter of course and, up to that time, the clock held no interest for me. I was keen for making sales and added many a large dollar to my record during the evening work. We were really a happy little family until the boss took on a new man to fill a vacancy.

Disturber Enters Contented Family.

"He was a bright, alert chap—of the Rawlins type, I suppose—and he had not been with us more than a month before he began sowing the seed of discontent. He induced us to believe that we were being badly treated and that we were entitled to pay for overtime work; he so thoroughly imbued us with the idea that finally I was prevailed upon to beard the boss in his den and lay the matter before him.

"I guess I was badly rattled when I bearded him, but I managed to stammer out what was in my mind, but, believe me, I had no sooner done so than I wished that the floor might open up and swallow me. The boss was a kindly man, but as he realized the force of what I was trying to say his face hardened—I can see him yet—but gradually his features softened. His eyes continued to bore straight through me until

I was so thoroughly unhappy that I hardly knew where I was.

"Finally he picked up a pencil and, giving me another searching look, he asked, 'Jim, how long have you been with us?'

"'Nearly two years,' I replied.

"'Been well all that time?'

"'No, sir; I was sick for a week last fall,' and as I answered I saw him jot the figure '6' down on a memorandum pad.

"'If I remember rightly, you several times have asked for an afternoon off.'

"'Not more than four times in the last year—once when mother was very ill,' I gulped, and down went the figure '2' on the pad.

"'You had two weeks' vacation at full pay, didn't you?' he went on.

Figuring up Donations of Time.

"There was no denying it and, as first mystified, when he penciled '14' on the paper it dawned on my befuddled brain what the boss was driving at, and I felt myself shriveling.

"'And there are at least six legal holidays, and we have also observed the Saturday half-holiday regularly throughout the year, haven't we? And 52 half-days are equal to 26 full days,' he remarked, as he jotted down that figure. 'And you've been paid for all of them, and for the legal holidays, too,' he added, looking up.

"I was in a cold sweat by this time, and tried to stammer out an apology and beat a retreat. But the boss wouldn't have it that way. I had to remain while he added up the figures he had penciled.

"'That makes a total of at least 54 days for which you've drawn salary when you did not do a tap of work,' he remarked."

"Gads!" ejaculated Reilly, who had followed the Sales Manager's narrative intently. "I never saw it put that way before. That sure was a clincher!"

Clipping the Day in the Morning.

"I really felt the need of fresh air, but the boss never let up," went on the Sales Manager, not noticing the interruption. "'Have you and the rest of the boys arrived promptly at 8.30 in the morning? Have you always returned from lunch on the stroke of one? Have you ever "beat the clock" at closing time? Have you ever written personal letters or done any other personal work during business hours? Have you?' he insisted, his tone rising almost to anger.

"I knew every man in the place was guilty on practically all of those counts, but I couldn't make reply; my tongue refused to move. I simply hung my head.

"'I'm sorry for you, Jim,' he went on in a kindlier voice. 'I worked for a salary myself for a good many years and know men pretty well. Although you probably think I don't know it, I've seen all you boys slip in late in the mornings and quit before quitting time. But this is not a great big concern and I have a dislike for time clocks, and as long as you did not make a practice of it I closed my eyes and said nothing. I knew you all made up for it by working 10 or 12 evenings during the year, so I've not been too strict. I'd rather overlook an occasional lapse than make my men grouchy by calling them down every time they make a slip.'"

"That's right!" blurted Reilly. "When an employe nurses a grouch he isn't worth much to the man who pays his salary."

"'But when I have occasion to call them down,'" continued the Sales Manager, still repeating his boss's language, "'I try to make myself thoroughly understood. Do you think you understand me?'

"I managed to mumble 'Yes, sir,' and, rising, the boss remarked, 'You may go now.'

"My brain was in such a whirl that I was not sure that I did understand, after all, and at the door I turned and half gasped, 'Does it mean I'm discharged?'

Employe's Debt to His Employer.

"'It means nothing of the sort,' the boss replied. 'Go back to your work; but let this be a lesson to you, and to those who sent you here; tell them that if they prefer to be paid by the hour or the day instead of by the week, we'll try it for a while,' he interjected with a quizzical smile, and added: 'And at any time, or wherever you may be, and the notion again seizes you that your employer owes you something, or isn't treating you fairly, just ask yourself if you owe him anything, or are treating him fairly, and, unless I'm mightily mistaken, you'll find that there's a great big balance due him.'"

The Sales Manager heaved an involuntary sigh of relief at the recollection of his experience, and added:

"And believe me, Reilly, I have never forgotten that lesson."

"You'd be all kinds of a damned fool if you did forget it," airily but earnestly retorted Reilly. "It has given even a wise gentleman like myself something to think about."

Origin of the "Steel-Eating Worm."

That metals have become diseased and that the diseases themselves may be contagious is fairly well known, though it is only comparatively recently that any real light has been shed on the habitat and habits of the so-called "steel-eating worm," even though it long has been known that that interesting "species" is the result of a highly imaginative brain. It appears that as long ago as 1866 in the great iron and steel center about Haspe in Germany, a society known as the "Ulk," which in English means fun, was formed, for the discussion of matters pertinent to the trade. It was at one of the meetings of this society that the "steel-eating worm" was evolved and its fame spread far and fast.

Briefly, it consisted of nothing more terrifying than a short length of rubber tubing of small diameter partly closed at each end and filled with a dilute solution of hydrochloric acid. The "worm" was imprisoned in a small bottle partly filled with steel scales, and when properly agitated with a glass rod emitted a drop of acid, which, of course, attacked the steel, thus supposedly proving that the corrosion was due to a secretion of the "worm," which also, supposedly, lived by eating the scale.

Why Springs Require Lubrication.

Most people who own automobiles have a more or less vague appreciation of the fact that there ought to be lubrication of some sort between the leaves of springs, but it is probable that few ever stop to figure out just why this is so. The usual notion is that if the springs are not oiled or greased they will squeak. Which is all right as far as it goes; but really it is only a small part of the truth. The resiliency of a spring is due to the fact that it is made of a number of comparatively thin leaves which slide upon each other as the spring is alternately compressed and relieved.

If the spring was a solid piece of steel it would have practically no "give"; the more friction there is between the leaves the nearer it approaches to a state of solidity. On the contrary, the less friction there is the more resiliency and life the spring will possess, and this is where smooth surfaces and lubrication play their parts. Many cases of hard riding can be traced directly to friction in the springs, and if there be any who think spring lubrication a matter of small moment in its relation to comfort, they should try a few experiments and set themselves right.

Rope "Tires" to Prevent Skidding.

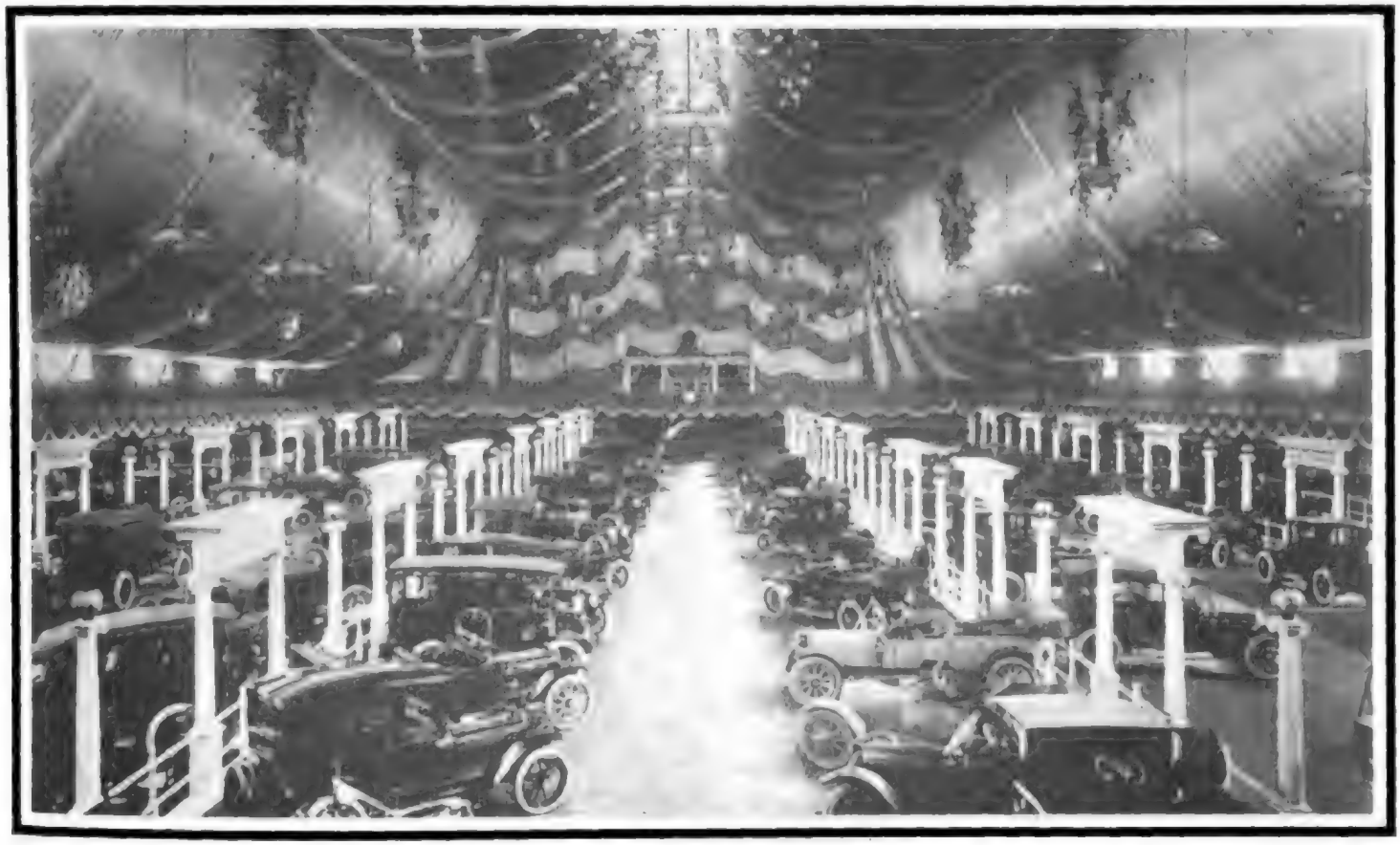
By way of overcoming the skidding proclivities of steel shod wheels, which are much in favor abroad for the heavier types of commercial vehicles, a prominent firm of steel wheel makers has evolved what is known as a "winter wheel." In its simplest aspect, it consists of the usual wheel with a deep recess cast in its periphery. Into the recess there is pressed rope in short sections, the sections first being impregnated with pitch and subjected to heavy pressure to impart to them the required curvature. It is said that the rope tires give mileages up to 6,000 before requiring replacement and that the replacement itself is a simple and inexpensive operation.

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BROOKLYN SHOW OPENS WITH ONE-LAP PUSHMOBILE RACE

"Pipe-Torpedo" and "Fierce-Barrow" in "Deadly Combat" on Armory Floor — Fifty-three Dealers Display in Spanish Setting.

Ralph Mulford, who drove a Pipe-Torpedo which was "engined" by Edward Carter, Jr., led home Louis Disbrow behind the wheel of a Fierce-Barrow, the motive power of which consisted of Charles Tate.



LOOKING DOWN MAIN AISLE OF BROOKLYN (N. Y.) SHOW IN TWENTY-THIRD REGIMENT ARMORY

in their one-lap match race on the 23rd Regiment Armory track at Brooklyn on Saturday evening last, 22nd inst. All of which marked the opening of the third annual show of the Brooklyn Motor Vehicle Dealers' Association, which is holding sway in the building for the remainder of the week, until Saturday evening next, March 1st.

The Spanish garden setting of last year has been supplanted by a California "garden," and to this end the regular lighting fixtures and those which have been introduced to supply the added brightness are fairly laden with orange blossoms. The arched roof has been draped with alternate strips of gold and white bunting, and draperies of the same character bedeck the galleries. In the matter of booths, the same scheme that was indulged in last year prevails; the various exhibits are designated by ornate columns, white in the semblance of marble, which carry captions bearing the names of the dealers and of the cars on view. Smaller columns interposed between the larger ones are topped with potted plants. The lobby has been treated in altogether different style, with the result that it has been converted into a Venetian garden. Much of the eye-pleasing effect is due to the illuminated colored glass columns which have been reared on either side and the vine-entwined lattice bower which hides the ceiling.

While the comparative nearness of the show to the New York show would seem to indicate that nothing not on view at the latter would crop out in Brooklyn, such is not the case, as the exhibits of the 53 dealers who have 68 different makes of motor vehicles, either pleasure cars of commercial cars, on view, reveal no less than three of the former and two of the latter that were conspicuous by their absence at the national show. They are the Palmer-Singer, Crawford and Church-Field electric pleasure cars, which are respectively shown by Drouet & Paige, Inc., Prospect Park South Garage, and Church-Field Electric Car Co., and the White Star and Cass commercial vehicles, shown by the White Star Motor & Engineering Co., and the Farrell Automobile Co., respectively. Of the five, the White Star truck alone is a local product, although the Palmer-Singer is made not many miles away in Long Island City. Nothing new cropped out in the displays of the 25 accessory dealers. The cars on view are:

Haynes, R. C. H., Henderson, Jackson, Cadillac, Hudson, Baker electric, Standard electric, S. G. V., Pierce-Arrow, Mitchell, Stutz, Kissel, Reo, Premier, Packard, National, Herreshoff, Peerless, Crawford, White, Locomobile, Abbott-Detroit, Buick, Simplex, White Star truck, Winton, Maxwell, Olds, Knox, Ford, Cole, Paige, Velie, Oakland, Saurer truck, Mack truck, Hewitt truck, Garford, Stevens-Duryea, Hupmobile, Pathfinder, Rambler, Lozier, Moon, Studebaker, Pope-Hartford, Firestone-Columbus, Columbus electric, Apperson, Cass truck, Regal, Chalmers, Mercer, Pullman, Lansden truck, Maccarr truck, Palmer-Singer, American, Autocar, Church-Field electric, Universal truck, Benz, Norwalk, I-H-C truck, Sternberg truck, Rauch & Lang electric.

Swinehart to Enlarge Akron Plant.

Contracts have been let by the Swinehart Tire & Rubber Co. for the addition of a three-story building to its main plant in Akron, Ohio. The new structure will be 100 x 70 feet. Several other buildings, including a laboratory, 30 x 60 feet, only recently were completed.

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HOLD LARGER TORONTO SHOW IN GOVERNMENT BUILDINGS

Exhibit, Having Outgrown Armouries, Accommodated by Dominion Officials—Fifty-one American Cars in Total of Sixty-one.

Having outgrown the Armouries which has housed the exhibit for several seasons past, the annual show of the Toronto Automobile Trade Association and the Ontario Motor League, which was inaugurated on Thursday evening last, February 20th, is this year being presented in the Canadian National Exhibition Grounds, the Transportation Building and the Dominion Government Building forming the housing. All told, 61 different makes of pleasure cars and commercial vehicles are shown by the 46 dealers who are displaying, and of the number all save eight which are of British manufacture, and three local products, bear American nameplates. Comprehensive displays of motor appurtenances are made by the 37 accessory dealers who hold space.

The cars of local manufacture which are on view are the Russell, McLaughlin, and Canadian Keeton. The Russell is built in four models on as many chassis, three of which are Knight engined; the fourth is provided with a poppet valve motor. The price range is from $2,600 to $6,200, the cars being fully equipped even to electric lighting and starting systems. The McLaughlin is built in three chassis sizes, all of which are equipped with four-cylinder motors; the price range is from $1,450 to $2,350. The Keeton is built in a single six-cylinder model and lists at $2,850.

Decorations, while by no means elaborate, are more than ordinarily eye-pleasing. The long halls which lead from the entrances of the buildings to the exhibition halls have been green burlapped to a height of four feet on the walls. The remainder of the walls and the ceilings are trimmed with white lattice work entwined with smilax and rambler roses, the foliage serving partially to conceal myriad vari-colored incandescent lights which furnish the illumination. In the Transportation Building, the walls have been draped with red bunting and the ceiling girders with white, green and yellow streamers; the floor is covered with green burlap and 40 flower-entwined lattice work posts serve to designate the booths. In the Government Building the decorations are much the same, save that red burlap covers the floor and the Canadian coat-of-arms done in artificial flowers embellishes each of the four walls. The exhibit will remain open until Saturday evening next, March 1st.

The cars on view are: Russell, National, Ford, Pierce-Arrow, Chalmers, Paige, Hupmobile, Cadillac, Pope-Hartford, Reo, Mitchell, Matheson, Auburn, Republic, Oakland, Tudhope, R. C. H., Norwalk, Alco, McLaughlin, Fiat, Studebaker, Henderson, Cole, Locomobile, Albion, Case, Winton, Mack truck, Jackson, Wolseley, Keeton, I. H. C., Cutting, Chevrolet, Empire, Little, Nyberg, Straker-Squire, Peerless, Stevens-Duryea, Hudson, Autocar, White, Sheffield-Simplex, Peek, Brockville-Atlas, Commer truck, Stutz, Overland, Gramm truck, Buffalo electric, Humber, Tate electric, Rauch & Lang electric, Regal, Kissel, Metz, Ohio electric, Packard, Detroit electric, Lozier.

Paterson's Show Staged in Armory.

Paterson, N. J., which made its initial venture into the show-producing field last year, when the Paterson Automobile Dealers' Association offered its first annual show in the State Armory, is now engaged with its second attempt. As was the case last year, the dealers who are exhibiting automobiles, either pleasure or commercial, number 18; they represent 29 different makes. Accessories are shown by 16 dealers. In the matter of decorations, walls and ceiling have been hidden by the profuse use of bunting and the drill room made more than ordinarily bright by the addition of many electric lights festooned over the aisles. The exhibit, which opened up on Monday evening last, 24th inst., will be in progress for the remainder of the week until Saturday evening next, March 1st. The cars shown are: Henderson, Paige, Cadillac, Ford, Marion, American, Overland, Franklin, Alco, Buick, Stevens-Duryea, Studebaker, Nyberg, Fiat, Michigan, Oakland, Lozier, Chalmers, I-H-C truck, Premier, Reo, Hudson, Little Giant truck, Cole, Stutz, Moyer, Brockway, Abbott-Detroit.

Three Cities Join in Davenport Show.

That in unity there is strength amply was demonstrated at the annual show of the Tri-City Automobile Dealers' Association, which held sway in the Davenport (Ia.) Coliseum from Wednesday evening, February 19th, until Saturday evening last, February 22nd. The 35 dealers—with business locations either in Davenport or in the two across-the-river towns, Moline and Rock Island (Ill.)—presented in all 40 cars, products of as many different automobile factories. The cars shown were: Abbott-Detroit, American, Auburn, Buick, Cadillac, Case, Chalmers, Cole, Ford, Havers, Hudson, Imperial, Kissel, Knox, Krit, Lozier, Maxwell, Michigan, Midland, Mitchell, Moline, Nyberg, Oldsmobile, Overland, Paige-Detroit, Packard, Pierce-Arrow, Pope-Hartford, Rambler, Stearns, Studebaker, Thomas, Velie, Baker electric, Broc electric.

DECORATED ARMORY HOUSES SYRACUSE DEALERS' DISPLAY

Both Drill Halls of State Structure Required for Event—Five Local Manufacturers Are Numbered Among Exhibitors.

Both of the drill halls of the massive State Armory at Syracuse, N. Y., have been pressed into service to house the pleasure car displays of the fifth annual show of the Syracuse Automobile Dealers' Association which was inaugurated on Tuesday evening, February 25th, to continue until Saturday evening next, March 1st. The basement is given over to the displays of commercial cars, motorcycles and accessories.

Smilax laden trellises conceal the walls in both of the halls and the ceilings have been covered with draperies of magenta and gold. By way of designating the different booths, standards bearing classical busts are utilized and each space is marked with ornamental pillars, from which hang signs of scroll design. Facing the main entrance is a huge fountain, in the shape of a female figure holding aloft a torch.

Naturally the products of the local manufacturers, the H. H. Franklin Mfg. Co., the Sanford Motor Truck Co., the Palmer-Moore Motor Truck Co., the Chase Motor Truck Co. and the Moyer Motor Car Co. are much in evidence among the exhibits of the 42 dealers who are displaying. In all 49 pleasure or commercial vehicles of different makes are shown, but only the Moyer car was not on view at either of the national shows. Accessory manufacturers are amply represented by the two dozen dealers in appurtenances who hold forth in the basement.

The vehicles on view are: Franklin, Overland, Cadillac, Reo, Rambler, Packard, Moyer, Ford, Buick, Stevens-Duryea, National, Krit, Winton, Chalmers, Oakland, Pierce - Arrow, American, Cole, Locomobile, Case, Regal, Lozier, Velie, Studebaker, Pope - Hartford, Haynes, Firestone - Columbus, White, Palmer-Moore truck, Baker electric, Federal truck, I-H-C truck, Chase truck, Cartercar, Standard electric, Moline, Michigan, Alco, Sanford truck, Packard, Garford, Overland, Cadillac, Abbott-Detroit, Menominee truck, Metz, Detroiter, Rauch & Lang electric.

Motometer Opens Chicago Branch.

The Motometer Co., of New York, which makes the device of that name for indicating the heat of a motor, has opened a branch in Chicago at 1322 Michigan avenue. It is in charge of R. G. Ames, who also represents the Long Horn in the West.

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EFFICIENCYIZING DISPLAYS OF ACCESSORIES

Fixtures That Help Speedometers Connect Themselves With the Dormant Desire of the Customer—Poor Displays Seldom Effective—How Sales May Be Inexpensively Accelerated.

One day old man Van Ornam, whose prototype may be found in any community in the country, was downtown when an irregular cough in the ordinarily smooth sing of his motor reminded him that one of his spark plugs had been giving trouble and that, not having an extra plug, he had driven home on three cylinders the last time he was out, so old man Van Ornam thought this a convenient time to buy a couple of plugs and be prepared for future emergencies; he drove around to the thoroughfare where an accessory dealer held forth, went into the store, bought the plugs, put one in the "dead" cylinder and drove on.

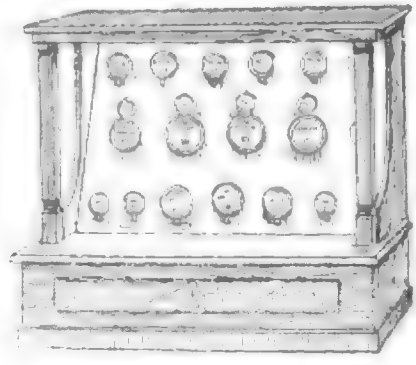
Need of a Speedometer Realized.

Now, old man Van Ornam had a pretty good car and enjoyed driving, and often took long tours on Sundays and holidays, which journeys often ran well over the century mark, and the way the car stood up under such long-distance work was a matter of pride with the owner; he liked to tell about how far he had driven and the speed his car would make when he wanted to "let 'er out," but he often had felt the handicap which was imposed upon his story-telling by the fact that when it come to a matter of actual figures he was forced to guess, for he happened to have one of those cars which are not equipped with a speed and distance recording device when they come from the factory. Sometimes the manufacturer may include a speedometer in his equipment, but he hasn't done so yet.

Old man Van Ornam had often lamented the lack of a speedometer and several times after he had gotten home from an unusually satisfying tour he had vowed he would get a speedometer the next day; he wanted one, he could well afford one, and all that was needed to effect the purchase of such a device was for the desire to arise in his mind at a time when it was convenient to buy one.

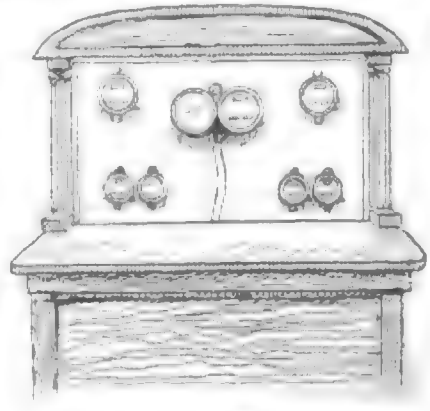
Lack of Display Loses a Sale.

When he went into the accessory store to buy the spark plugs he was in the proper place to have purchased a speedometer, but he didn't buy one; the accessory man had such wares in stock and would have been glad to sell one to old man Van Ornam, and as evidence that the accessory man wished to accommodate his trade with a complete stock there were several speedometers securely reposing on a stock shelf waiting for just some such man as Van Ornam to step up to the counter and ask for such an instrument.



STEWART'S ELABORATE CABINET

"I display them," an accessory dealer may say, "I have several of them lying in view on a counter," but the accessory man, when the question of display is gone into, must admit that speedometers lying tipped over in any old position on top of a counter are but half displayed, and half a display is often as good as no display at all. Maybe the accessory man has nothing on which to



WARNER DISPLAY "BUREAU"

display his speedometers, and if such is the case a trip to the recent national automobile shows would have been instructive to him, for manufacturers, at least, realize the value of displaying speedometers, and there were presented numerous methods not only of holding these instruments up before the public but of forcing them upon the attention of those who come within the classification of possible buyers.

These methods involved fixtures of varying sorts, and while some were inclined to be a trifle elaborate others were very simple and there probably was none which would not eventually repay the dealer for the expenditure necessary for the installation of the displaying device.

Effective Fixture of Low Cost.

One of the simple type, but one which achieved the purpose for which it was designed was utilized by the Hoffecker Co., of Boston, Mass., and its construction should not prove difficult for a man of average mechanical ability; certainly a clerk who handles accessories ought to be able to construct the device. It was made to rest upon a counter and consisted of a flat board base and a glass dash at the back, the board base, of course, being polished and finished to a high degree of attractiveness, and over the base was another sheet of glass which accentuated the luster of the wood; the whole was nothing more than two planes of glass, fastened together at right angles and set upon a large, flat board.

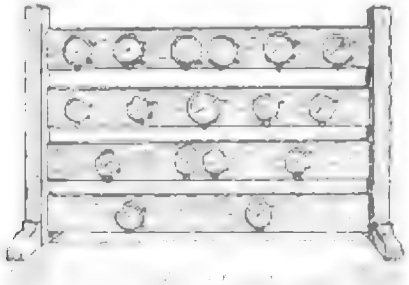
The instruments were attached to the glass dash by means of the customary attachment which secures them to the dash of a car, holes bored in the glass dash allowing the passage of bolts or screws. This device possessed the quality of being simple and not overcrowded, and neither did the fixture assume such prominence that the speedometers became a secondary consideration. A dash clock occupied the top center position on the dash and two speedometers at each side with a fifth on the base near the dash completed the layout. Also, with this fixture, as with any other, it would not be difficult to connect at least one of the devices by a flexible shaft to a motor underneath the counter and thus make the whir of wheels compel the possible buyer to let the seed of covetousness be sown in his mind.

Device that Looks Like Bureau.

Should the accessory man not wish to utilize counter space for a fixture of this class he may find the alternative in a device worked out by the Dean Electric Co., of Elyria, Ohio, which won its full measure of

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attention, although it had but two Elyria-Dean recording devices upon its display device. With the speedometers removed, a newly-married man might mistake the fixture for some kind of a boudoir accessory, and had it a mirror and drawers it might well answer the purpose. It was a small, bureau-like structure of some attractive wood, walnut, perhaps, and was an excellent sample of cabinet work and, while speedometers to the number of a dozen might have been heaped in a pile upon the top of this device, but two were shown, and they were attached to the upright surface which usurped the place that might have been held by a mirror. One instrument was connected by a flexible shaft to a small motor in the place where drawers might have been, which explains the reason for what might be imagined to be waste interior space. This device could be placed to any



CORBIN-BROWN SIMPLICITY

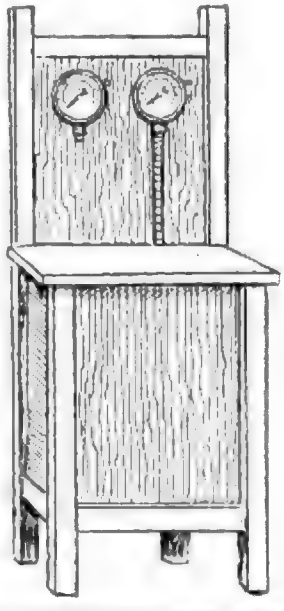
advantageous position on the store floor and a few booklets, left on the polished top, would likely be noticed by a man who had any interest in speedometers.

Ornamentation and Good Arrangement.

Similar in construction was a fixture which carried the wares of the Warner Instrument Co., of Beloit, Wis., but it was wider and more ornate and was able to carry a larger number of instruments without giving the appearance of being overloaded; while the Elyria-Dean "bureau" was of a strict mission design the Warner device went in a trifle more for decorative work and the upright posts at the sides of the upright back were fluted and the cross-piece at the top bore a wide, square head about its edge. Where the mirror might have been were this a bureau was a polished wood surface of almost mirror finish and upon this the instruments were mounted; an accompanying illustration shows the taste of arrangement, a large-dial, dual instrument, running, occupying the central position, while others, of smaller size, were appropriately located. As in the Elyria-Dean device, a motor in the box-like base furnished action.

It might require a man with some cabinet-making experience to turn out a neat job in either of the last two named, but any boy who ever cut and fitted tenon joints in Sloyd school would make easy work of the fence-like structure which did good service on the counter of the Corbin Screw Corporation, of New Britain, Conn., which company produces the Corbin-Brown speedometer. What description is needed for this piece of constructive work is necessarily much less than the value of the device, for while it was nothing but two upright standards with four cross-boards tenoned into the supports, it effectively carried a number of instruments, as an illustration shows.

In passing from the Corbin-Brown display to that of the Stewart & Clark Mfg.



DEAN'S EFFECTIVE DISPLAY STAND

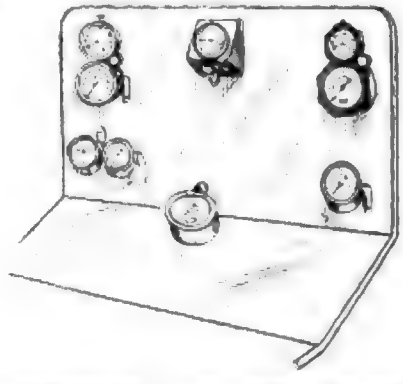
Co., of Chicago, Ill., the accessory man necessarily would be impressed by the elaborateness of the device which displayed Stewart instruments and which, by the fluctuating of dial pointers, the gentle hum of moving wheels and the exposure of the "internals" of the products transformed the casual passerby into an interested onlooker; in fact, it caught and held his attention not for a moment but for a considerable time, for the examination of all the alluringly displayed wares could not be made in an instant.

Elaborateness Compelled Attention.

Stewart & Clark, who in reality are one with the Warner company in the new Stewart-Warner Speedometer Corporation, went to some expense in fitting up their cabinet, of which the fundamental construction was a wood box base with a recessed upright section on top of it, square pillars being a part of this latter section. In the recess, as an illustration shows, was a flat wood surface, covered with black cloth and tipped backward at a small angle; the instruments were attached to this black surface, where they stood out in fine detail, and a motor, horizontal shaft, belts, wheels of different diameters and six flexible shafts beneath the box caused six instruments to operate at different speeds. Plain speedometers and odometers and combinations of these and a clock were visible, intact and in section, while in one corner was a gradometer which told the grade to which the tilted plane was inclined. In a window a fixture of this kind could hardly fail to let the most uninterested person know that the accessory man carried speed recording devices.

Interest in Exposure of "Internals."

Few dealers, probably, would care to fit up such a display fixture, and in the same class was a sectional hub odometer shown in the Veeder exhibit, for to the dealer this latter would mean the sacrificing of an in-



HOFFECKER'S GLASS DISPLAY "DASH"

strument which cost him good money and would necessitate great labor, but few dealers, on the other hand, would decline the use of such a novelty if loaned by the maker.

In all of these fixtures not only is display afforded, but there is opportunity for that greater drawing power which is obtainable through motion; practically everyone knows what a speedometer looks like, but the average motorist, if he is wise, seldom sees what the inside of his looks like, and often he wonders what makes it go, so it is no more than natural for him to be interested in a running instrument of which the mechanism is exposed.

Had old man Van Ornam, when he entered the accessory store, seen a speedometer attractively and effectively displayed he might have stopped to look at it and, had it been running, it is certain he would have given it more than passing attention, whether it were in section or not; and had old man Van Ornam gone this far, the dealer, were he a good salesman, would have investigated the customer's need or desire for such a ware and the possibilities, at least, of a sale would have been greatly increased.

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WHY STORAGE SHOULD BE GARAGE'S MAINSTAY

Metropolitan Garageman, Who Raised His Rates, Explains Why Storage Should Be Backbone of the Business—Deriving All Profits From Gasolene an Unnatural Business Arrangement—Stable Rates vs. Garage Expenses.

Ask any garageman whether prices which he to-day obtains are sufficient to enable him to realize a substantial profit on his business; nine out of ten will answer in the negative. Ask him if his is not just as legitimate a business as keeping a grocery store or running a hotel and he will answer in the affirmative, and emphatically. From which, then, is deduced the question, "Why do garage rates prevail on such a basis as to afford a scant profit or none at all?"

Origin of the Car Storage Rate.

There are two answers; one is that the garage business is largely an outgrowth of the stable business and, as such, has brought with it the old stable charges, but with enlarged expenses. The other answer is that garages which were started as new businesses were instituted without the charges being fixed according to the running expenses, both of which answers account for a storage charge which is a money loser.

There probably is no more reliable a source of information on garage history and conditions than a man who has graduated from the horse stable business into the garage field, who knows the charges and costs of the former business and who has watched and been a part of the development of the garage industry, and of such men probably as capable of discussing the situation as any is William J. Joscelyn, proprietor of the Joscelyn Garage, at 112-26 West 52nd street, New York City, the earlier history of which is indicated by the fact that the business is operated by the Joscelyn Stable Co. Joscelyn, whose services as an officer in the National Guard of the State of New York several years ago has caused the title of "Captain" to remain with him, inherits the business from his father, who established the stable something like a half century ago.

Urges Garages to Raise Their Prices.

Joscelyn recently not only raised his car storage rates $5, but issued a circular letter to his fellow tradesmen urging them to follow his example: it is the only way, he says, to put the business anywhere near where it belongs. At the time he raised his storage rate he fixed a retail price for gasolene which is but three cents above the wholesale price of 17 cents per gallon. It is his intention that the retail price will fluctuate with the wholesale figures and thus remove for the garageman that terror which ensues when the garageman, whose profit comes from gasolene, sees the advancing wholesale price cutting big holes in his net income.

Joscelyn's idea is that the cost of gasolene and storage should make the charges and that the charges should show a profit, just as the stable business made money. His garage may differ somewhat from some others in that the proprietor knows to a fraction of a cent where the expense money goes to and whence the profits come, and there is a rigid business system in the whole establishment; to find how much per car per month it costs for sponges or cleaning material it is necessary only to look in the company's books.

Early Charges Fixed by Dealers.

In the beginning of the trade, stated Joscelyn, the first garage in New York City, and doubtless in many other cities, was opened by a dealer in cars who wished to care for those who bought cars of him; a man bought a car and on congested Manhattan Island it could not be kept at home, wherefore this dealer rented a building and charged a price which was as small as could possibly be made and bring in the rent. This was a beginning of present-day storage charges. This dealer made his money on sales; making profits on storing the cars was not his intention, and this evolved a rate schedule which would not permit a profit to the man who wished to run a garage as a separate business.

COMPARATIVE MONTH'S EXPENSES AND RECEIPTS FOR STABLE AND SAME BUILDING USED AS A GARAGE.

Stable		Garage	
Expenses			
Capacity	115 horses		120 cars
Rent, $5.50 per horse and two wagons	$633	$7.44 per car	$893
Office payroll	240		773
Labor payroll, $4.32 per horse	596	$14.42 per car	1,543
Feed, $12 per horse	1,360	Cleaning material, $2.17 per car	232
Expense account	224		744
Advertising	80		50
Sundries, water, etc.	24		100
Loss and breakage account	0		10
Total expenses	$3,157		$4,345
Receipts			
112 horses, $35	$3,920	107 cars, $37.50	4,012
		9 "dead," $10	90
			$4,102
		Total loss	$243
		10,700 gallons of gasolene at profit of 11 cents	1,177
Total profit	$763	Profit realized by high retail price for gasolene	$934

Beginning of Repairshop-Garage.

Then there was the garage which sprung from the repair shop, and this is what Joscelyn terms the second step in the development of the garage; those who have followed the automobile trade from its inception remember well the numerous repair shops which sprang up everywhere. This man's profits were made from his repairing work, and if he could persuade a man to store his car in a vacant part of the building or if the owner wished space and the repairman could accommodate him the shop owner figured that by having this kind of a hold on the car he was fairly sure of getting practically all of the repair work, which in the early days was no small item. Therefore there sprang up a low storage

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rate in this direction, fixed as in the first case by a man who did not care to make money on his rental of space because his profit was derived from some other source.

Many times the man who stored a car with these first two named classes of tradesmen had stored a horse and his carriage or carriages and, naturally, he did not believe he ought to pay more for car storage than for horse storage, and here enters the garage rate which has sprung from the stable rate. As Joscelyn, himself, says, "We figured that if we stored a horse and generally two carriages for $35 a month and had to feed the horse we were stepping into a fine thing when we turned our stable into a garage wherein we would store one car alone for $35 and the owner would be paying for fuel, where before we had been paying for feed. We figured on a double profit." This was in 1909.

Why Stable Didn't Pay as Garage.

But that Joscelyn "figured wrong" is indicated by the accompanying comparative table of receipts and expenditures which shows where the mathematical error cropped out; just as many men started up garages as a new business and charged what corresponded with the stable rate, or was less. Joscelyn turned the 75 x 100 four-story building which had been a stable into a garage and proceeded to wonder why the investment did not bring the dividend which had been taken out regularly with stable equipment.

The systematic operation of the establishment soon revealed the true conditions. To start with, when the building was altered and improved, with concrete floors, electric lights where gas had been before, steam heating, gasolene tanks and the numerous other necessary improvements, the rent proceeded to just about double up. Also, where there had, for the stable, been a superintendent and bookkeeper in the office, there now was necessary in addition a night superintendent, stock man, two telephone operators, a checker and an engineer.

Cars Necessitated More Workmen.

In the other parts of the establishment there had been washers, floormen and grooms; now there were needed more washers and floormen, with doormen and elevatormen, and the labor payroll nearly tripled. Two or three washers used to take care of the 220 or 230 wagons, and the men got $16 a week, but in the garage 10 or 12 washers were required to keep the cars in shape and their pay was in the neighborhood of $20 a week. Cleaning as charged off against feed shows a saving in the garage, but it is not sufficient to offset the other increased expenses.

What Joscelyn itemizes as "Expense account" includes lights, heat, repairs and such costs, and the increase is accounted for by the fact that where the lighting with gas cost $60 a month electricity cost $150, heating the stable cost $50 a month, the animal heat from the horses being a source of considerable warmth, and now the heating jumped to $500 a month; there likewise were more repairs necessary in the garage.

Made Gasolene Supply Deficiency.

The figures given in the accompanying table are an average of two Novembers and Decembers, two of the busiest months in the year, and, as is shown, the stable expenses were $3,157 while the garage cost $4,345. The profits in the stable, which had a capacity of 115 horses, were derived from 112 horses, with which went, generally, two wagons for each horse, and at $35 a month the income was $3,920, which left a profit of $763 a month. Now, the garage could accommodate 120 cars, but in the months in question there were stored 107 "live" and 9 "dead," the latter bringing in $10 and the others averaging $37.50, the number being about half open cars at $35 and half closed cars at $40. This totaled an income of $4,102 and a net loss of $243 a month.

How, then, may he asked, could the owner afford to keep up the business? The answer is "gasolene," and this same answer is the reason that garagemen have been so much more hard hit than owners by the climbing proclivities of that petroleum product; Joscelyn bought gasolene at 9 cents and sold it for 20 cents and every car consumed about 100 gallons a month, most of which was bought at the garage. This meant a profit of 11 cents on 10,700 gallons, which amounted to $1,177. Deducting from this the loss of $243 on storage, and the Joscelyn Garage made $934 profit, which is $171, or 22 per cent, better than the stable.

Reorganized Expenses and Profits.

When gasolene, about 15 months ago, began to increase in price, and with every increase there disappeared a part of the garage profits; some garagemen went out of business, but the Joscelyn Garage did not. The proprietor said, "The business is on a poor basis; it is not businesslike. We will fix a storage charge which will allow a profit independent of gasolene sales and, whereas we have been inclined to increase gasolene and continue extracting out profits from that, we will cut gasolene to a profit of 3 cents a gallon and make our retail price fluctuate with the wholesale price on a 3-cent profit basis; if the wholesale goes up a cent we will raise a cent, and if it drops a cent we will drop a cent."

This decision was made at the beginning of last October, but before going further it may be explained that Joscelyn had taken other steps to make more money; the first Joscelyn Garage had been in the same space as the stable, but about two years ago, just after the date the comparative table describes, the space was doubled, a duplicate of the old stable building, also four stories and 75 x 100 feet, being acquired. This made it possible to double the number of cars stored without quite doubling the number of garage employes and the office force was not increased at all. Also, certain efficiency-producing changes were effected; where there had been two washrooms on each floor one washroom was made for each floor. This reduced the number of washers by cutting out waste time in the moving around of crews and by substituting pushers for washers in several instances, and at lower wages. Also, the new washstands utilized what had hitherto been a passageway between the two halves of the building and the old washstand space was used for storage. Numerous changes such as this cut the labor payroll per month from $2,962 for the winter of 1911-12 to $2,764 for the present winter.

Owners Satisfied With $5 Increase.

To return to the raise in storage five months ago: Every owner who stored with Joscelyn was notified that storage was being raised from $35 for open cars and $40 for closed cars to $40 and $45, respectively. Out of 238 owners but four left the garage, and they were speedily replaced by others; many of those who stayed wrote to Joscelyn stating that they were satisfied with the new arrangement. Joscelyn states that it is his belief that it will not be long before another five-dollar increase will be justifiable. He states that he is making money now, but that he would not be making an exorbitantly large amount if this raise was made, and he adds that he believes supply and demand will support the higher price.

Supplementing his circular letter to the trade urging garagemen to follow him in his increased storage and reduced gasolene prices, he says the garageman who doesn't get a living rate for storage is bound to be weeded out. He doesn't advocate $40 and $45 storage for all garages, for he is in the high rent district, but he does urge garagemen to put profit where profit belongs and charge accordingly. The answer that "So-and-So around the corner won't raise—he cuts prices," is met by the statement that So-and-So is only digging his own financial grave and would raise only too quick if the movement were general. As to cut-rate garagemen he said: "I do all I can to help them; I fill 'em up as fast as I can. If a man thinks I am too high I send him to some cut-rate neighbor; the more I send the quicker the cut-rate man will go out of business."

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ROBBING VALVE GRINDING OF SOME OF ITS TERRORS

Making a Simple Device that Faces the Valves—Easily Made, Easily Used and the Material Costs Next to Nothing.

Grinding in a set of valves that are rather the worse for wear is not always a particularly easy job, especially if they belong to a six-cylinder motor; by the time all the seatings are brought down to their normal condition the grinder is very likely to wish the valves in a climate even hotter than their accustomed habitat.

Making Up a Valve Grinding Block.

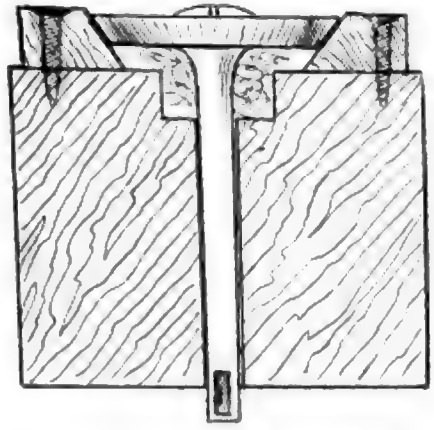
A valve that is in bad condition is not uniformly worn, as a rule, and in order to get it down to a proper bearing more must be taken off one part than another—a job which can be done with a fine file in skilled hands and, of course, in a lathe if one is available. Assuming, however, that a set of valves that is in bad shape must be put right without a lathe, and one does not care to take the time needed for filing, a good deal of time can be saved and good work done by means of a "rig" that is somewhat crude, to be sure, but answers the purpose very well and is easy to make.

As the accompanying illustration shows, the grinder is made of a block of wood, preferably hard wood, in which a hole is bored to take the valve stem. The hole should pass clear through the block, unless the thickness of the wood is greater than the length of the valve stem, and should be of such size that the stem will be rather a tight fit. A little countersink at the top will allow for the fillet under the valve head. Four small hardwood blocks are screwed or nailed to the main block at equal distances from each other and at equal distances from the center hole.

Cutting and "Loading" the Bevels.

The only part of the work of making the grinder that requires any degree of accuracy is the beveling of the blocks; they must be cut so that the valve bevel will bear equally on each. The way to do it is to cut the bevels as nearly as possible to the correct angle before fastening down the blocks and lining them up against the valve itself, which is put in place for the purpose. By turning the valve and at the same time bearing down on it, not too hard, marks will be made on the wood where there is contact and no marks where there is none; or there will be heavy marks where there is close contact and light marks where the faces barely touch. A fine file, carefully used on the blocks, will quickly bring about an even bearing. It does not matter if the hole has not been bored exactly at right angles to the surface of the block; the trimming of the small blocks will compensate.

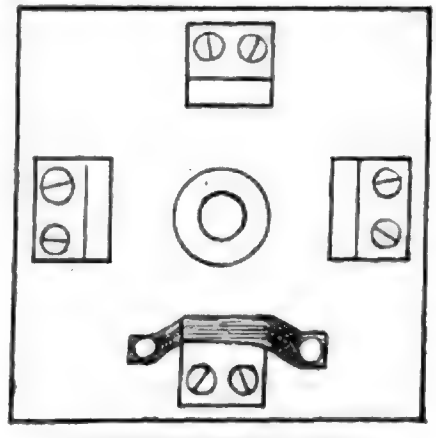
The grinder is now about ready for use. Before commencing operations, however, the hole for the valve stem should be thoroughly lubricated with very thick graphite



GRINDING BLOCK IN SECTION

grease, or graphite and oil mixed to the consistency of a thick paste and worked into the wood with a valve stem or a close-fitting rod. There is a good reason for using thick grease or paste, for not only would oil fail to provide the right kind of lubrication, but it would cause the hole to contract and grip the valve stem too tightly.

To use the grinder, it must be "loaded" by stretching a small piece of medium emery cloth—not emery paper—over each of the beveled blocks, the cloth being held by a couple of good, stout thumb-tacks in each piece, pressed into the surface of the main



APPLYING EMERY CLOTH

block. The cloth must lie close and flat on the beveled faces of the blocks. Put a valve stem in the hole, bring the face against the emery-covered bevels and turn the valve, preferably with a brace and screwdriver; the emery will, of course, cut down the valve surface. The cloth is easily renewed when worn. The grade or coarseness of the emery must be regulated according to the condition of the valve; a badly worn valve needs a coarser grain than one only slightly worn.

This method of facing valves does not by any means eliminate the usual grinding; it merely reduces the time and labor when the valve faces are in bad shape. When the grinder has brought the faces to a fairly smooth condition the valves should be tried on their seats, when any inequalities in either will be indicated by the usual marking. If the high spots on the valve appear to be too prominent to be easily removed by grinding in place, they may be reduced on the grinder by turning three of the pieces of cloth blank side up and rubbing down the high spots of the valve on the remaining piece of emery that is right side up. Truing up the valve in this way, testing it from time to time on the valve seat, has the advantage of removing the minimum amount of metal from the seat as well as from the valve itself.

Knack in Getting Best Results.

In order to prevent particles of emery from getting into the hole and scratching the valve stem a little bunch of waste may be packed around the stem under the head, filling the countersink, or a thick felt washer may be used. When a valve has been faced off in this kind of a fixture it will be found that the stem has been beautifully smoothed up and the graphite well worked into it. Not only is the grinder easily made, but there is nothing about it that will wear out rapidly, and it will last for a long time. With a little practice the operator becomes quite skilled in its use and work can be turned out quite rapidly. There is a knack in getting the best results from it; once acquired, it will be found well worth the trouble.

Of course, only a single size of valve can be ground in a single block, so if it is desired to work on valves of different sizes there must be a block for each size. The blocks are so easily made, however, that the trouble is well worth while. While grinding a valve the "rig" should be held in the vise or in some other secure way that will eliminate the possibility of the end of the valve stem coming against anything.

Adjusting Gap to Suit Load.

If the motor misses when under a light load it is well before making carburetter adjustments to make the spark plug gaps just a trifle wider—that is, if magneto ignition is adhered to. Missing under heavy loads or when the motor speed is slow may sometimes be corrected by closing the gaps slightly. In either case, the amount of change in the length of the gap should be slight.

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BALTIMORE CONDENSES ITS EXHIBITION TO ONE WEEK

Display, Which Last Year Ran Two Weeks, Takes But One This Season—Forty-two Dealers Show Half Hundred Vehicles.

Unlike the procedure of last year, when the annual automobile show of the Automobile Club of Maryland and the Baltimore Automobile Dealers' Association was given in two parts, with pleasure cars exploited during the first week and commercial cars on view during the second, this year's show did not run for even a full week. The exhibit "opened up" in the Fifth Regiment Armory on Tuesday evening, February 18th, and continued throughout the remainder of the week until Saturday evening last, February 22nd.

The vaulted roof of the Armory was almost hidden, for just beneath the ceiling was stretched a canopy of mountain laurel and smilax supported on a wire cable structure and studded with many electric lights. The side walls and the balconies were draped with bunting of alternate pure white and delicately tinted green interposed with American flags and the black and gold emblems of the automobile club.

In the ranks of the 42 dealers who had on display 33 different makes of pleasure cars and 17 different makes of commercial vehicles, were two whose products are foreign to shows outside of Baltimore—Carl Sporer's Sons Co., which makes the Sporer pleasure car, and Lord Baltimore Car Co., which makes the Lord Baltimore truck. Both are native products. The Sporer is built in three models on two chassis, the larger of which mounts a 40-horsepower motor and the smaller a 25-horsepower motor. The motors both are of the four-cylinder type and are of standard construction throughout. The larger model, the 7-passenger touring car, lists at $2,000. All models are fully equipped, even to a motor starter of the electric type.

The Lord Baltimore trucks, two of which were on the floor, are made in four sizes ranging from 1,000 pounds to five tons carrying capacity; price range is from $2,000 to $4,250. The trucks exhibit standard practice throughout, employing a four-cylinder motor, three-speed selectively operated gearset and roller chain drive.

In the displays of the two dozen accessory dealers who crowded the galleries, nothing that is startling cropped out; motorcycles were shown by ten dealers. The pleasure cars on view were: Packard, Studebaker, Oakland, Locomobile, American, Apperson, S. G. V., Pierce-Arrow, Peerless, Chalmers, Rauch & Lang electric, Ford, Sporer, Lambert, Church-Field electric, Cartercar, Lozier, Paige, Norwalk, Stevens-Duryea, Overland, White, Pullman, Cole, Stoddard-Dayton, Maxwell, Empire, Stearns, Mitchell, Michigan, Havers, Detroit electric, Kissel, Krit. Commercial vehicles shown were: Packard, Universal, Studebaker, Oakland, Locomobile, Lippard-Stewart, I-H-C, Kelly, Pierce-Arrow, Chalmers, Peerless, Lord Baltimore, Chase, Mack, Saurer, Schacht, White, General Vehicle.

Plans Altered for St. Louis Show.

Despite the original plans which called for a two-week show, the first week for the exploitation of pleasure cars and the second for the display of commercial vehicles, both types of motor vehicles were on the floor at the same time when the St. Louis Automobile Dealers' Association opened its eighth annual exhibit in the Coliseum on Monday evening last, February 24th; the show will continue for a single week, until Saturday evening, March 1st. The change in plans resulted from the fact that many of the commercial vehicle distributers have their display cars at Kansas City and cannot get them back in time.

The exhibit comprises some 34 different makes of pleasure and commercial vehicles displayed by 26 dealers; accessories innumerable shown by 11 dealers, and five different makes of motorcycles, shown by four dealers. The displays are staged in a summer garden setting artfully created by virtue of the use of mountain laurel, smilax and southern moss; the scheme eliminates all view of either walls or ceiling, as well as of the many electric lights.

The cars on display are: Reo, Little, Staver, Borland electric, Speedwell, Marion, Cutting, Detroit electric, M & T, National, Warren, Argo electric, Marathon, Cartercar, Midland, Kissel, Imperial, Ames, Crow, Haynes, McFarlan, Penn, Pullman.

The commercial vehicles shown are: Reo, Speedwell, Brown, Smith, Gramm, Modern, Palmer, Indiana, Dart, Commerce, Little Giant.

Evansville Winds up its Second Show.

Saturday evening last, February 22nd, saw the close of the second annual show of the Evansville (Ind.) Automobile Dealers' Association, which was staged in the Evansville Auditorium. For four days the even dozen dealers displayed the products of 17 different automobile factories in an improvised southern garden setting. Half a dozen accessory and motorcycle dealers augmented the ranks. The cars on view were: Pope-Hartford, Auburn, Detroit electric, Locomobile, Chalmers, Krit, Studebaker, Cadillac, Overland, American, Marion, Oakland, Cole, Ford, Rambler, Reo, Marmon.

CARS A WEEK, TRUCKS THREE DAYS AT CINCINATTI SHOW

Green and White, Club Colors, Adorn Hall Which Houses Exhibit—Forty-eight Cars Presented by Thirty-five Dealers.

Green and white, the colors of the Cincinnati Automobile Club, form the color scheme at the fourth annual show of the Cincinnati Automobile Dealers' Association, which opened its doors in the Music Hall on Monday evening last, February 24th. Walls, floor and ceiling all are green, bunting and streamers of that tint, with an occasional strip of white serving to hide the plaster, while the floor is covered with burlap; the booths laid off with white fixtures form a pleasing contrast.

For the first week, until Saturday evening next, March 1st, pleasure cars will hold sway; during the first three days of next week, until Wednesday evening, March 5th, the commercial vehicle will come into its own. During the present week pleasure cars to the number of 48, of different makes, are being exhibited by 35 dealers; accessories are shown by an even dozen dealers.

The cars on display are: Buick, Marmon, Pope-Hartford, Pierce-Arrow, Packard, Hudson, R. C. H., Rauch & Lang electric, Locomobile, Detroit electric, Oakland, Stearns, Cole, Baker electric, Fiat, Chalmers, Speedwell, Overland, Krit, Pathfinder, Schacht, Hupmobile, Apperson, Ford, Cadillac, Stevens-Duryea, Paige-Detroit, Herreshoff, Franklin, Haynes, Regal, Premier, Reo, Alco, Michigan, Empire, White, Peerless, Ohio, McFarlan, Abbott-Detroit, Ohio electric, Nyberg, Chadwick, Dorris, Rambler.

Oshkosh, too, Stages an Exhibit.

Eight automobile dealers who exhibited just twice that number of motor cars of different makes comprised the annual show of the Oshkosh Automobile Dealers' Association, which was brought to a close Saturday evening last, February 22nd, after having been in progress four days. The exhibit was housed in the Oshkosh Auditorium, which was suitably "glad ragged" for the occasion. The cars on view were: Cadillac, White, Studebaker, Pope-Hartford, Overland, Winton, Kissel, Reo, Regal, Buick, Chalmers, Ford, Rambler, Mitchell, Empire, Imperial.

Fisk Lets Large Warehouse Contract.

The Fisk Rubber Co. of Chicopee Falls, Mass., has placed contracts for the erection of a large warehouse in that city. Its cost will approximate $400,000.

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KEEPING PAINT SHINING ON AUTOMOBILE BODIES

Fundamentals of Body Washing Expounded — Simple Methods that Produce Best Results—Using Cold and Hot Water.

There are a good many things that can be done in a good many different ways, all more or less satisfactory as to results; but it is doubtful if there are as many methods of doing any other one thing as there are of washing automobile bodies. Every painter has his favorite way of restoring a travel-stained vehicle to its "pristine beauty" and every garage that takes pride in its work has a method of its own. So it happens that an inexperienced person who is looking for the right way to keep his car body looking as it ought to look is apt to become embarrassed by the very wealth of information on the subject.

While doubtless most of these "favorite methods" are entirely satisfactory, there are a few general rules that are at the bottom of the whole business of washing automobile bodies, and if they are followed the varnish will retain its good appearance for the maximum length of time. These rules, which are recommended by the Franklin Automobile Co., do not cover the whole art of body washing; they are sufficiently comprehensive, however, to enable anyone who follows them carefully to keep his car looking its best. They are as follows:

"Never use soap on the body of the automobile.

"Never use a sponge or chamois on the body until all the dirt and grease has been washed off.

"Keep the sponges and chamois clean. This means cleaning them half a dozen times while washing one car.

"Use different sponges on the body and on the running gear.

"Rinse the car thoroughly and carefully after washing.

"Do not use a strong force of water on a newly painted car.

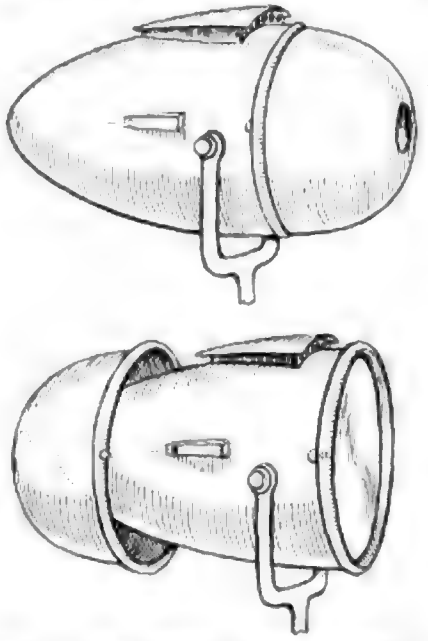
"Do not wash the car too much, as each time it is washed it takes just so much of the luster off.

"All mud should be taken off with a hose, as any other way scratches the car."

Every time a car is washed the varnish loses some of its lustre; it is best, therefore, not to wash oftener than is necessary, and the process should not be unduly prolonged. Ordinarily the washing water should be at such a temperature that it will not cause discomfort to the person doing the work; if the car is covered with ice or frozen mud warm water will greatly facilitate the washing. Under no circumstances, however, should the water be hot.

"Dousing the Glim" of Headlights.

The disagreeable, not to say dangerous, effects produced by the glare of the powerful headlights commonly used on automobiles have stimulated lamp makers to devise means for diffusing the light and eliminating the blinding parallel beams that are as unnecessary in the city streets as they are advantageous on country roads. Translucent shades, adjustable shutters and other means have been employed with more or less success. Among the effective methods is one adopted by the well-known New York firm of body builders, Healy & Co., in a special form of headlight.



HEALY LAMP, DOUSED AND UNDOUSED

The Healy lamps — which, incidentally, are made only to order—are designed primarily for cars of speedy types, such as high-powered roadsters and other machines of the class known to Britishers as "sporting" cars. Of the bullet outline, they offer little resistance to the air. The lenses are of more or less standard form. The light-reducing device consists of a conical cap which is placed over the front of the lamp, pointing forward, of course, and held in place by spring catches. In the apex of the cone is a small aperture, about an inch and a half in diameter, with a plain lens, and all the light that escapes is what can get through this small opening. With the shield in place the lamp is a double-pointed affair and has every appearance of belonging to a car of power. When the conical shield is not in use it is ingeniously disposed of by slipping it over the back of the lamp, where it is held by snaps so constructed as to be free from rattling.

CHARGES SCALPING METHODS IN INSURANCE REPAIR WORK

St. Louis Dealer Explains Why Such Jobs Are Refused by the Average Shop—Rebates and Discounts One Reason.

"Insurance jobs," as repair work done for insurance companies under the liability clauses in their contracts is styled, are "exceedingly distasteful" to at least one St. Louis dealer, and from his own conclusions in regard to this apparently perplexing problem he may not be alone in his likes and dislikes.

"There is a never ending struggle between the repair shop or service department of the automobile concern and the insurance adjuster," he says, and further intimates that much of the trouble can be laid directly at the door of the insurance companies themselves for their predatory methods in obtaining estimates for work from one repair shop, preferably that connected with the agency for the disabled car, and then relegating the work to a smaller shop which can do the work, or is willing to "make a show of doing it" more cheaply.

If a car which has been disabled is returned to the agency for repair, he points out, the agency finds it incumbent upon itself to place the car in the best possible condition and for the work a legitimate charge must be made. Often, however, he continues, the insurance company can get the work done more cheaply (and not so well) for less money, with the result that the inferior work reflects against the credit of the car and the agency. "Dope jobs," they are styled, also, and they are expected to look well though their lasting qualities are problematical.

"Many legitimate repair departments," he says, "hesitate about estimating on repair work, for they know that the very schedules for needed repairs that they make up at expense to themselves will simply be used by certain insurance concerns as guides to other houses which do the work at less cost."

"For instance," he continues, "there is one concern whose foreman will make an estimate only on a cash payment of $100. His reason is this: To take down a car and inspect it thoroughly in every part to make sure just how much new stuff must be put in and what hours of labor are necessary to complete the work and so to turn it out as good a car as it was before the accident are things which mean a great many hours of time used by mechanics and also call for a large amount of exact mechanical knowledge, which certainly deserves being paid

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for. If it were a surety that the job would be turned in to his repair shop he probably would not be disposed to charge for making the estimate, but he knows that if he prepares a full list, giving in detail the things that will have to be done, chances are that this will be taken at once to some other concern, whose mechanics may not get the same scale of wages as do his, and who are able, when it is plainly indicated to them just what must be done, to turn the work out more cheaply.

"Then, again, not having the same pride in the work or not being impelled by any feeling that it must reflect on the merits of the car if the job is not well done, the outside concern is not going to put the same careful attention on things that the regular repair shop would do. Furthermore, inasmuch as the repairers that the insurance companies are more likely to hire will have to come for needed repair parts back to the agency repair shop, and as selling these parts is necessarily a source of a certain amount of profit without any chance of loss, this is another reason why, rather than undertake the annoyance of the insurance company's work, it is refused by the average concern.

"Arrangements cannot be made with the insurance company as they can with the owner direct, and there are certain requests for discounts and rebates which are likely to be made by the insurance concern which also are distasteful to the agency. This is another and very important reason why 'insurance jobs' are not popular with the automobile repair shop.

"Very often a good deal more work is put on the replacing of the body and in patching it up than is done on the running gear of the machine itself by the outside repair man, and although this makes a nice appearance when it is completed, it cannot be expected to go the route. The making of an estimate offhand is nearly an impossibility, especially when a car has been damaged by fire. There may be a hundred and one things to do that do not appear on the surface, but some repair men will undertake to do a job for almost nothing and then of course must slight some part of it in order to come out ahead of the game. How the situation can be met with satisfaction to all concerned is a problem. The average result is that the owner gets something the worst of it."

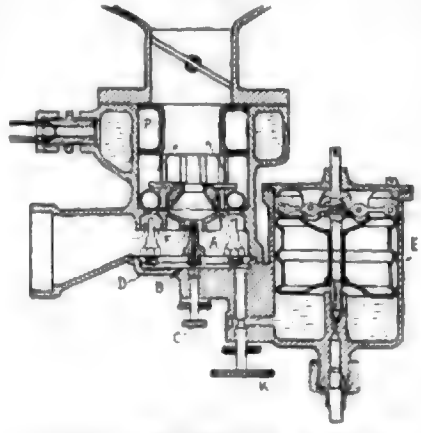
Proper Position for Lock Nut.

When a thick nut and a thin one are put on the same bolt, one nut acting as a lock- or jam-nut, it is the thickest nut that should be put on top. The reason is that when the last nut is screwed home hard it takes the bulk of the load, pulling up the slack of the thread of the first nut, which thus has less of the load to carry.

"FLOATING" STEEL BALLS CONTROL GASOLENE SUPPLY

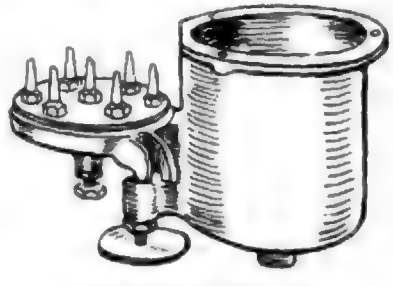
Unusual Manner of Proportioning Fuel to Speed in New Daimler Carburetter—Seven Jets Employed.

Taking a leaf out of the book of those carburetter designers who regulate the amount of air content in the fuel mixture with the aid of "floating" metal balls raised



DAIMLER CARBURETTER IN SECTION

by suction, the British Daimler company has evolved a new type of carburetter which operates on somewhat the same principle and for which great claims for efficiency and economy are made. The carburetter differs from those in which "floating" balls control the extra air, however, in that the balls control of the fuel instead of the air. The amount of fuel in the mixture, therefore, is directly proportioned to the suction,



ARRANGEMENT OF JETS

which, in turn, depends upon the speed of the pistons, thus governing the quality of the mixture by the speed of the motor without regard to the size of the throttle opening.

In its simplest aspect, the carburetter is of the usual float-feed type and differs from others of its kind essentially in that it has seven jets, six of them being arranged concentrically about the seventh, the arrangement being shown by the accompanying sketches. Only one of the jets, however, is adjustable; it is centrally located (A) and is provided with a needle valve (B) and an adjusting screw (C). Adjusting the needle valve permits of proportioning the amount of fuel in the mixture for slow running, the central jet being the only one which opens directly into the mixing chamber. The other six jets are fed from a common chamber (D) which is directly connected to the main float chamber (E), the latter being orthodox in every particular.

Above each of the six jets there is an orifice (F) which normally is closed by a small steel ball the motion of which is limited by a spider and a distance piece (P). In operation, and with the motor running slowly, all of the suction is concentrated upon the central jet and is not sufficient to raise the balls off their seats and permit the other jets to come into action. Directly the speed of the motor is increased, however, the increase in suction operates to lift the balls off their seats, thus permitting fuel to be drawn from all seven jets, and as the amount the balls are lifted off their seats is governed by the suction which in turn, is governed by the speed of the motor, the fuel content in the mixture remains practically constant for all piston speeds.

One of the peculiarities of the carburetter is that all the jets are of the same size and are interchangeable, thus facilitating assembly in case it becomes necessary to take the device apart for cleaning. As a means of adjusting the main gasolene supply, there is provided a valve with a milled screw head (K), the purpose of which is to increase or decrease the amount of gasolene fed from the float chamber to the chamber beneath the jets.

When Lights May Damage Paint.

For the sake of the battery, it is not well to allow the lights of a car on exhibition to be illuminated for prolonged periods, but there is also another reason why the headlights should be extinguished—the rays are liable to singe the car ahead. The parabolic reflector not only acts in conjunction with the mirror to concentrate the rays of light but to concentrate the heat rays also, and it so happens that if the car ahead is positioned in the focus of the lens the heat accumulated at the spot after some time is sufficient to damage the paint work.

Quick Way to Cut Sheet Metal.

The quickest way to cut tin or other sheet metal with a cold chisel is to put it in a vise with the cutting line level with the jaws, and use the chisel along the top of the jaws. A straight, easy cut can be made in this way, and the sheet can be shifted if the cut is longer than the width of the jaws.

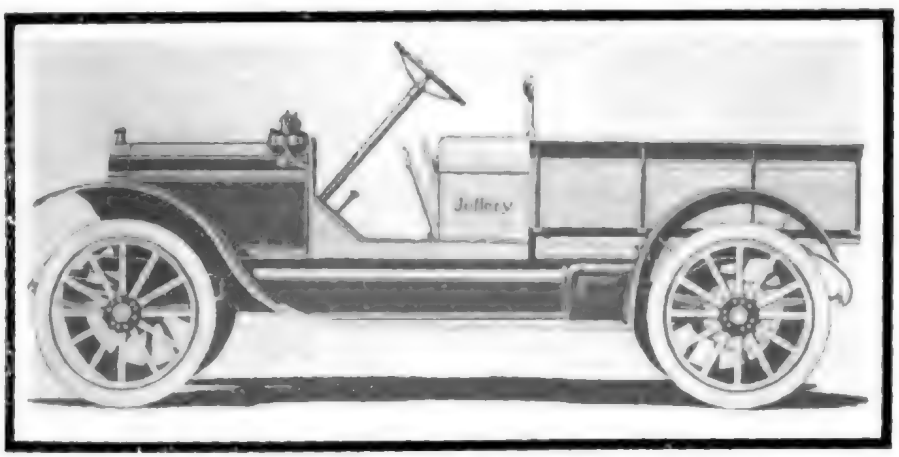
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JEFFERY NAME PLATES ON TWO LIGHT MOTOR TRUCKS

Standard Features Throughout Both Models—One Chain Drive and One Shaft—Pneumatic Tires on Lighter Machine.

Two new light trucks bearing the name "Jeffery" on their name-plates have been placed on the market by the Thomas B. Jeffery Co., of Kenosha, Wis., well and widely known as manufacturer of Rambler pleasure cars.

The new machines have carrying capacities of 1,500 pounds and one ton, respectively, and in both cases the propelling power is generated by a motor rated at 32 horsepower, driving, in the case of the lighter machine, through shaft and bevel gears to the live rear axle, and in the case of the heavier car through countershaft and side chains to the rear wheels. The motor of the lighter of the two is placed under a hood forward of the dashboard and is cooled by pump-circulated water, and its charges are ignited by a high-tension magneto. Three forward speeds are provided for in the gearset, which is controlled by a lever on the right side. Semi-elliptic springs are employed for the front suspension and three-quarter ellipties support the rear. Internal and external brakes are on the rear wheels.



SIDE VIEW OF JEFFERY 1,500-POUND DELIVERY WAGON

The wheelbase of the light car is 120 inches. Pneumatic tires 4½ x 34 inches are fitted to both front and rear wheels. Over all the chassis measures 168 inches; the length of the frame back of the seat is 68 inches and the space available for loading is 78 inches wide. When the car is fully loaded the platform stands 30 inches from the ground. There is tanking capacity for 20 gallons of gasolene and for one gallon of lubricating oil.

Considerable experience and not a little experimenting has led the manufacturers to distribute the weight 40 per cent. on the front axle and 60 per cent. on the rear axle; this gives sufficient weight for traction on the rear wheels, sufficient for steering on the front wheels, and the tires are not overloaded. The maximum speeds are 6½, 13 and 27 miles an hour for first, second and third speeds, respectively. The price of the chassis is $1,250, and of the machine complete with open express body, $1,325.

New York Dealers Elect Officers.

Henry M. Bronner, of the Edwards Motor Car Co., was elected president of the Automobile Dealers' Association, of New York City, at its annual meeting on Thursday last, 20th inst. He succeeds John F. Plummer. Arthur M. Day, of the A. Elliott Ranney Co., was elected vice-president, to succeed Frank Eveland, of A. G. Spalding & Bros., who in turn became secretary-treasurer because of the retirement of C. P. Skinner. In addition to the three officers, the new directors are as follows: M. J. Budlong, Charles M. Brown, I. N. Uppercu, C. H. Larson, H. L. Stratton, Wm. C. Poertner and W. Arthur Lesser. The directors who retired are: John F. Plummer, Robert D. Garden, C. P. Skinner, W. S. M. Mead and A. L. Newton. Charles A. Stewart remains in office as general manager. The Dealers' Association also appointed a committee to watch legislation at Albany.

Prest-O-Lite Continues Refilling Campaign.

As a part of its campaign in New York State against dealers who refill Prest-O-Lite tanks with other than Prest-O-Lite products the Prest-O-Lite Co., has filed suit in the Municipal Court in Syracuse, N. Y., against the Central City Rubber Co., of that city; the charge is made under a section of the New York State Business Law and a penalty of $100 is asked. Similar cases have been tried in the Municipal Court in New York City and a decision is being awaited. Suits in numerous other "York State" towns are contemplated.

HE DID THE RIGHT THING BUT IT STALLED THE TRUCK

What Curtailed the Trouble Man's Morning Sleep—A Driver Who Carried Out His Instructions Too Literally.

It was about six o'clock in the morning when the Trouble Man awoke with a start, looked at his watch, observed that a blustering wind was driving dry snow against the window, and turned over for another snooze. The bed was warm and comfortable and the hissing of the snow outside the window soothed the Trouble Man only less than the consciousness that there was nothing likely to occur to disturb him for the best part of an hour. So he slept.

Possibly he slept for five minutes; certainly it was no more than that when the telephone bell rang. The instant the Trouble Man heard the silvery jingle he knew, by virtue of a well-developed telepathic instinct that someone was in trouble somewhere and that there was to be no more snoozing that morning.

"Hello!" said a discouraged voice at the other end of the wire, "Is this the Trouble Man? Well, No. 2 is stuck in the middle of 48th street with seven tons of coal on an' I can't get her started. No, the snow don't stop her, but the engine won't run. What? No. She runs a little when she's cranked an' then stops dead. Yes; plenty of gas; spark all right. Can't you come down right away? The load's part of a rush delivery."

To the accompaniment of a choice assortment of grunts and cuss words the Trouble Man got into his clothes, swallowed a cup of hot coffee and butted into the storm. Arrived at the scene of inaction, he found the truck occupying a prominent position in the middle of the street, its bulk increased by a liberal capping of snow and the driver industriously cranking the motor, which would run for a few revolutions, cough a cough or two, and stop.

"Well," said the Trouble Man, without enthusiasm or warmth, "what's the trouble?"

"Dunno," said the driver, a new man, unhappily; "watch her."

He switched on the battery—there was a dual ignition system—and gave the crank a vigorous swing. Off went the motor, apparently as lively as could be desired; round went the driver to the switch and threw her over to the magneto. The immediate result was a cessation of activities.

"Well," said the Trouble Man, agitating his head sideways to get an accumulation of snow out of his left ear, "she won't run on the mag; why don't you let her run on

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the battery till you get back and then have a look at the mag?"

Then it came out.

"Why, you told me always to start on the battery and run on the magneto. I didn't know I could run on the battery."

"Start her up," said the Trouble Man with a weary sigh, "and let her run on the battery. I'll go along with you till she's running right."

Half a mile along the road the magneto was switched in for an instant. Result: Nothing better than an occasional husky cough. Another trial half a mile later, and the motor ran on two cylinders. A mile further along she would run on three cylinders and the fourth would spit occasionally with the magneto on the job. A few minutes later the little dynamo was grinding out "juice" in its usual efficient way.

At the point of delivery the Trouble Man explained.

"You left the cover off your magneto," he said, "and it got wet, and magnetos don't like to be wet. The fan drew the snow in through the radiator, you know. The warmth of the engine and the movement dried out the magneto by degrees until it would work again. That's all. Yes, you can run on the battery when you have to. But when you get back, for goodness sake put the cover on your magneto."

And the Trouble Man disappeared through a doorway outside of which was a large placard bearing the legend, "Combination Breakfast, 25 Cents."

New Orleans Show in Smilax Bower.

Washington Artillery Hall, which is in New Orleans, La., although far too small adequately to house the exhibit, was again pressed into service for the third annual show of the New Orleans Automobile Dealers' Association, which held sway in the Crescent City from Wednesday evening, February 19th, until Sunday evening last, February 23rd. While ceilings in the structure are low—too low, it would seem, to lend themselves readily to effective decoration—the decorative artist had not the slightest trouble in converting the place into a "bower" by the use of much smilax and moss and wistaria commingled with streamers of electric lights.

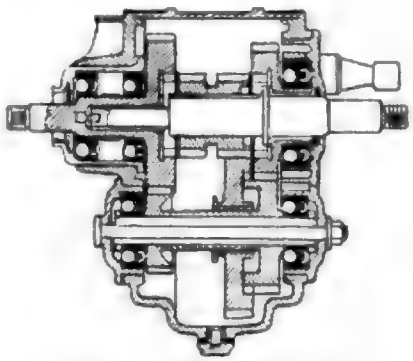
The eighteen exhibitors who displayed cars had a total of 29 different makes of pleasure and commercial vehicles on the floor; accessories, due to the scarcity of space, were meager. The cars shown were: Peerless, Reo, Cole, Michigan, Garford, Paige, Packard, Baker electric, Cadillac, Pierce-Arrow, Buick, Premier, Adams truck, White, Saurer truck, Hewitt truck, Mack truck, Hudson, Alco, Locomobile, Cartercar, Mitchell, Lozier, Stearns, Ford, Little, American, Case, Oakland, Overland.

GEARS CONSTANTLY IN MESH YET EMPLOYS NO CLUTCH

Unusual Construction in New French Gearset Employing Two Sliding Pinions—New Yorker Acquires American Rights.

H. L. Hardy, of 237 Fulton street, New York City, has acquired the American rights to the manufacture and sale of the Dux transmission, recently introduced in France by the Society de l'Evolution Automobile de Paris, and which is novel in that it is wholly devoid of dog clutches, although the gears always are in mesh; the design naturally permits very compact construction.

As is clearly shown by the accompanying illustration, which is of the three-speed type of transmission, the device is not unlike the orthodox gearset in general appearance.



DUX CLUTCHLESS GEARSET

The motor shaft carries splined to it so that it can be slipped from end to end in the usual manner, a small diameter pinion with a very wide face and grooved in the middle for the reception of the shifting yoke, and a loosely mounted gear wheel at the motor end provided with external teeth meshing with a gear wheel carried on the lay shaft and internal teeth into engagement with which the smaller pinion can be slipped, locking the larger wheel to the motor shaft. The driven shaft carries but a single gear wheel of considerable diameter which meshes with a pinion carried on the lay shaft; this pinion is formed integral with the larger gearwheel on the lay shaft, the connecting sleeve forming a shaft on which is mounted a slideable wheel meshing with the small pinion on the motor shaft and provided with an internal set of teeth designed to lock with the teeth of the larger wheel carried on the lay shaft.

The operation of the device is simple in the extreme. Starting from the neutral position—that is, with the small pinion of the motor shaft out of engagement with either the loose wheel on the engine shaft or the wheel on the propeller shaft, the loose wheel on the lay shaft is slipped into engagement with the larger of the integral pinions carried on the same shaft. Drive then is transmitted through the small pinion to the lay shaft with considerable reduction and from the small lay shaft pinion to the driven shaft wheel with further reduction. Second speed is obtained by locking the loose wheel on the motor shaft, whereat drive is transmitted to the lay shaft without reduction; the drive from the lay shaft to the driven shaft is always the same. High gear is obtained by engaging the small pinion on the motor shaft with the internal teeth formed in the gear wheel on the driven shaft whereby direct drive straight through from the motor to the propeller shaft results. When in the neutral position only the free wheel on the lay shaft is in rotation, but at all other times the lay shaft ensemble rotates. Reverse is obtained by means of a pair of integral clash gears, which are brought into engagement with the smaller pinion on the motor shaft and the gearwheel on the driven shaft and which naturally act as idlers.

How compact is the construction is exemplified by the fact the whole mechanism is contained in a case only 8 x 8½ inches; larger sizes providing four speeds and a type of heavier construction for use on commercial vehicles also are made to meet different conditions. The latter type, according to Hardy, has been adopted by the Society General des Omnibus de Paris for use in connection with motor 'buses.

Grand Forks's Show Lasts Four Days.

Grand Forks, which is in North Dakota, just has emerged from its "show season." The doors closed on the annual show, which is the second under the auspices of the Grand Forks Automobile Dealers' Association, on Friday evening last, February 21st, the exhibit having been inaugurated four days previous, February 18th. While the term "sumptuous" scarcely is applicable to the decorative scheme that prevailed, very much was done in the way of rendering the Auditorium eye-pleasing by the use of much tinted bunting, and not a few varicolored electric lights. Nineteen motor car dealers displayed, and their exhibits embraced 22 different makes of cars. The cars on view were: Overland, Regal, Oakland, Paige, Imperial, Velie, Reo, Michigan, Jackson, Studebaker, Buick, Kissel, Case, Rambler, Mitchell, Krit, Marathon, Staver, Hupmobile, Metz, Detroit electric.

A small amount of oil will help a hacksaw in going through wrought iron or steel, keeping the teeth cool and improving the cut. Only a little oil should be used however.

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BATTERY REQUIREMENTS FOR AUTOMOBILE WORK

Necessity for Determining the Capacity of Accumulators by the Lighting Load Made Plain by an Expert—Why Special Types of Cells Are Needed—Influence of Starter and of Voltage—Weight a Secondary Matter.

Perfection of the electric lighting and engine starting system which within the past year has become such a tremendous factor in the automobile industry, is due in no small degree to the strides which have been made in battery design and construction. The battery virtually is the heart of the system for upon its efficiency depends the efficiency of both the lighting and starting portions of the apparatus, which fact long has been realized and has acted to stimulate the production of batteries especially constructed for the rigorous work—the alternate heavy discharges and light discharges and intermittent charging—imposed by automobile work.

Careful Test as Trouble Avoider.

In drawing attention to the fact that already a number of prominent battery manufacturers have seen the light and now are supplying batteries which have been designed and constructed especially to overcome the difficulties raised by lighting and starting conditions, J. W. Fitzgerald, who is engineer to the Ignition Starter Co., of Detroit, Mich., in a recent address, laid particular stress upon the necessity for careful and adequate battery testing as a means of eliminating future trouble and obtaining real satisfaction. His remarks, which were contained in a paper read before the Detroit Section of the Society of Automobile Engineers, are particularly pointed and show a clear insight into the requirements of the automobile storage battery.

"The battery, which in very few cases is made by the manufacturers of the motors and generators, has been more or less of a bugbear in the development of the electric starter," he said. "But there are now a number of manufacturers of storage batteries who are making deliveries of batteries, especially adapted for starting and lighting.

Wherein Laboratory Test Differs.

"It should be borne in mind by the engineer making the test of a battery for this purpose, that the conditions surrounding a laboratory test and an actual test under service on a car are entirely different. In making a test in a laboratory we will take it for granted that efficiency tests and voltage drop tests, under varying outputs, are satisfactory. The engineer then proceeds to demonstrate in the laboratory that a continuous charge of the batteries at a certain current value will unduly heat the plates and damage the battery.

Conditions Met In Actual Service.

"This same test, conducted on a car, would actually have no bad effect upon the batteries. In the first place it is almost impossible to charge a battery continuously at a high rate in actual service, as this would mean that the car would have to be traveling uninterruptedly at a fairly high speed for many hours. Even if this were possible, the continual jarring of the machine acts as a mechanical shaker, tending to jar the gas collections off the plate before any damage is done. We are bringing out this point to show that it is not necessary to provide any means for discontinuing the charging of batteries after they are full. Attempts have been made to provide such a device, but have been more or less complicated, and not entirely satisfactory, and as long as the battery manufacturers themselves are willing to stand behind their product under the conditions stated above—that is, of continuous charging after the batteries are full—in actual road work, there is no reason why any complication should be added to prevent continuous charging. It is absolutely necessary, however, to provide such regulation of the charging current as will hold its maximum down to a safe continuous charging rate.

Determining the Size of Battery.

"The size of the battery is determined solely by the length of time the manufacturer of the car figures that it is necessary to keep the lights burning without any charging of the batteries. The capacity of the batteries should be not affected by the requirements of the starting motor. Our point is that the amount of power required for starting the car is very small as compared with what is required for lighting, due to the very short time that it takes to start a car. The battery is only affected by the starting device as regards its construction for furnishing a heavy output for a short time, without any damaging effect on its efficiency or life.

"In making a decision as to the capacity of the battery we claim it is therefore only necessary to consider the number of watts required for lighting the car, also bearing in mind that the efficiency of a storage battery is very much less in cold weather than under moderate temperature conditions.

Necessities Imposed by Starter.

"A more important point is a decision as to the number of cells used in the battery. In other words, what voltage is best suited for a combined lighting and starting outfit. There is no question but that a six-volt battery would be better if lighting only were considered. This is so because in the first place there are fewer number of cells to take care of and because there are now on the market six-volt lamps of remarkable efficiency for automobile lighting work. However, when the starter feature is added, there are points in regard to the construction of the motor and generator which have a strong influence on deciding the voltage of the battery, and if the six-volt system is used, it requires very careful and more difficult generator and motor design, as well as properly designed leads and cable connections, to do away with as much of the voltage drop as possible. It does not mean that because six volts are used in preference to a higher voltage, that the battery would be any lighter. It takes a certain weight of active material in a storage battery for a certain number of ampere hours output, almost entirely regardless of the battery voltage. We make this statement only as regards fair limits of, say, 6 to 24 volts. Of necessity, a greater number of retainers and cells in a 24-volt battery would weigh more than those required for a 6, but the active element practically weighs no more, so that weight is really no serious consideration in determining the voltage of the system.

Charging In Series Is Essential.

"The method of charging the batteries has been found by practical experience to be one of great importance. It is absolutely essential that the batteries be charged in series in order to keep them all in a uniform condition. It has been found that batteries connected up in parallel sets for charging cannot be kept uniformally charged, and

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that sooner or later one or more of the individual sets must be disconnected and brought up to a standard condition. This is, of course, very objectionable. This feature, therefore, is a determining factor as to the voltage of the storage battery—that is, the battery should not be of such a voltage as to require means for connecting the various cells in different series and parallel groups for either charging or discharging. This, as stated above, is not only objectionable from the point of charging the batteries, but also from the added complication of a control for doing this work.

"If a 12-volt system is used, the batteries can be charged and discharged in series and at the same time the lighting system can be wired up on the three-wire plan so as to give absolutely satisfactory results, on 6-volt lighting and a 12-volt system affords additional advantage of better and more substantial generator and motor construction with less difficulty of caring for a drop in voltage and smaller cable connections, due to a much lower current requirement at the higher voltage.

Securing Minimum Voltage Drop.

"In drawing off a heavy current from the storage battery it necessarily pulls down the voltage a great deal more than when discharging the battery nearer its normal discharge rate. The greater the pull the greater being the percentage of drop. Battery makers are now building batteries to give heavy current outputs and at the same time guaranteeing a minimum drop in the voltage. At the same time, much better results can be obtained by reducing the amount of current taken from the battery and maintaining a higher potential across the terminals.

"If a battery of any higher voltage than 12 is used, it involves a serious problem of wiring for the lighting system, due to the fact that all the lamps now used for automobile lighting are 6 volts, and it becomes a difficult problem to distribute the load on the batteries so that each set will be supplying its pro rata output for lighting and so prevent one set from being discharged faster than another, unbalancing the battery system.

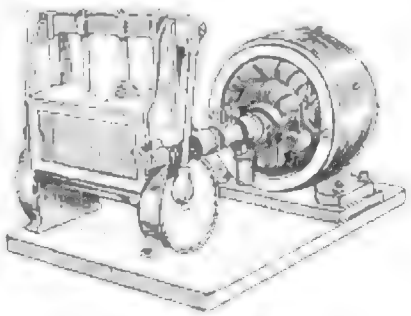
How Maximum Output Is Controlled.

"We have previously stated that it is, of course, necessary to limit the maximum output of the generator, as there is a safe maximum charging load for the battery used, and the current must not exceed this figure. The control of the maximum output and with as little mechanism as possible is provided for in many ways. The point to be kept in mind is to accomplish this regulation in as simple a manner as possible and still accomplish the result positively."

TIRE PUMP THAT OPERATES ON POWER FROM BATTERY

Judd-Leyland Evolves First Inflating Apparatus That Works When Motor Is Stationary—Worm Drive a Feature.

Not all motors are fitted with starters; nor do all which are not so equipped yield readily to the persuasion of the starting crank and pick up at the very first turn. Thus it happens that, however quickly and conveniently the motor driven tire pump will function once the motor is in operation, it sometimes is considerably less laborious to pump the tire up by hand than it is to start the motor, especially so in cold weather. It is for the purpose of eliminating starting the motor each time a tire is to be inflated and at the same time reducing the cost of operating the pump that the Juleco tire inflation pump has been brought out by the Judd & Leland Mfg. Co., of Clifton Springs, N. Y., which has been making manually operated tire pumps for a considerable period.



JULECO MOTOR PUMP

In its simplest aspect the Juleco pump is nothing more than a double-acting double-cylinder air pump driven by a small electric motor; power to operate the motor is furnished by the storage batteries to which the electric motor attaches through the intermediary of a starting switch positioned on the dash or other convenient location. By way of reducing noise to the minimum, the pump shaft is connected to the armature shaft of the motor through worm gearing and serves to impart the desired reciprocal motion to the pump plungers by virtue of a yoke connected to the pump shaft by a pair of pitmans operating on two wheels; the yoke operates in a pair of guides to the elimination of binding of the pump plungers.

The motor is more than ordinarily compact and at a speed of 3,000 revolutions a minute which it attains when operating under ordinary conditions on a six-volt circuit, develops 1/7th horsepower; the current consumed is 20 amperes. Lubrication of the motor is by means of orthodox oil cups and the pump is provided with an oil-tight casing for the retention of the lubricant. The device is so compact that it is contained in a neatly enameled pressed steel box measuring but 8 x 10 inches and 9 inches high which looks like an ordinary tool box and which as a consequence and for want of a better position assumes the same position on the running board.

The pump is not only recommended by the manufacturer as a solution of the problem of quick and easy tire inflation, but also as an auxiliary pump for use in connection with the compressed air type of engine starter, and its usefulness in this connection will at once be apparent to those who have to do with air starters. The device is supplied with a suitable length of armored double wire for making the connection to the battery, 12 feet of five-ply air hose fitted with an air cock and a pressure gauge, switch and fuse.

Illuminating Gas in Lieu of Gasolene.

That the ordinary gasolene engine is in a measure omnivorous—that for temporary purposes where efficiency is not desired it can be made to run on gasolene or natural gas or kerosene or alcohol with but slight alteration—is being put to very good account by at least one big Detroit automobile plant—namely, the Ford company. For some time past, Ford engines have been "run in" on artificial gas instead of on gasolene, the requisite apparatus for the purpose having been developed by the Detroit City Gas Co., which is a subsidiary of the American Light & Traction Co. The apparatus is nothing more or less than a suitably constructed mixing valve, and it is estimated that in addition to saving a really great amount of money the use of gas instead of gasolene for the purpose of preliminary testing also has a beneficial effect in that it reduces the demand for the usual fuel even if only by a slight amount.

That the amount may be more than slight, however, is revealed by the fact that some 150,000 engines will be turned out by the Ford company during the year and each ordinarily is run upwards of an hour "on the blocks" before a final test is made and the engine is placed in a chassis. The same plan of employing city gas for preliminary "running in" also is used in some of the large British factories, and its advantages may be appreciated by the statement of the head of one of them that at least $5,000 a year is saved by the proceeding. In the factory in question, it is estimated that an amount of gas necessary to run an engine as long as it ordinarily would run on two gallons of "petrol," at 25 cents a gallon, costs just 8 cents.

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ELECTRICALLY LIGHTING AND STARTING THE CAR

The Analogy Between Accidents and Neglect and Its Bearing on the Condition of the Apparatus—Value of Truthfulness in Dealing With Troubles—Features and Care of New Westinghouse System Made Plain.

(This is the twentieth of a series of articles designed to make clear the electric lighting and engine starting systems in use and to render easier their care and repair by the dealer and owner alike.)

Once upon a time, as the fairy tales say, though this is no fairy tale, a man called in a surgeon to set a broken leg; he said he had suffered no accident; just found himself that way. So the medico put one part of him in splints and the whole of him in the psychopathic pard of the hospital. Which, of course, is an old, old story, but it is a good one, nevertheless, and like, all good ones, it bears telling twice, particularly inasmuch as it has a point that may illuminate other and somewhat similar matters.



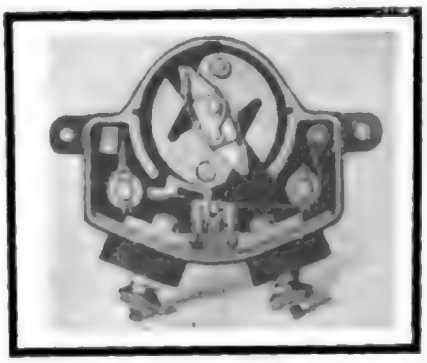
COMBINED MAGNETO AND GENERATOR

Suppose, for instance, that an owner appears at his dealer's place of business with an electric lighting and engine starting system that refuses to work. He insists that he has had no accident; that "he just found it that way." The dealer or the repair man knows that if he did "just find it that way" there must be a very good reason for it. No lighting and starting system "lies down"' for no cause at all. The days of such things are past.

It is certain that the man with the fractured femur figured in an accident of some sort; it is just as certain that the owner of the starting system would not deliberately stick a screwdriver into the works—for fun. Ergo: He must have had an accident of some sort, and it matters not a whit whether it was the result of physical impact or whether it was automatic and merely the result of plain neglect. The net result remains the same in either case. All of which assumes, of course, the apparatus was in perfect condition when the owner received it and that it was properly adjusted and fitted.

Bad Effect of Evasive Replies.

There is a conceivable reason for the reticence of the man with the broken leg, as his incarceration behind the walls of the psychopathic ward makes plain. (It also makes plain the reason for the broken leg.) His unwillingness to make public his failing for the cup that cheers is understandable. Also, he may not remember the accident that "laid him low." But the episode of the owner of the indisposed electric lighting and engine starting system is, as Monty Glass says in the satevepost, "something else again." Just why he should persist that he not only has had no accident but that he has "taken the best of care of the equipment" when the condition of the equipment itself belies him, is past reasonable understanding, if cognizance is taken of the uncontrovertible truth that the dealer is the owner's friend—that he wants to help the owner out of his difficulties if for no other reason than that it reflects to his own good credit.



ADVANCE POSITION OF BREAKER

If the owner affects ignorance of accident in the hope of "getting into" the dealer for repair work or replacements that legitimately ought to be paid for, his is a case of mistaken and misdirected efforts toward economy; it is unfair toward himself and unfair toward the dealer; it places them both in a wrong light. Rather than dispute the word of the owner, and thereby gain his ill will, the dealer must do the work and foot the bill uncomplainingly, knowing all the time that neither he nor the apparatus is at fault.



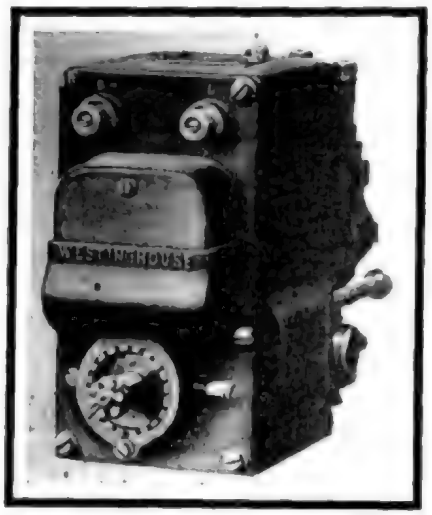
CIRCUIT BREAKING MECHANISM

If, on the other hand, diplomacy will draw from the owner a statement of the facts leading up to the trouble, both will be benefited eventually. The dealer will know exactly where to look for the trouble without needlessly taking the equipment down and thereby increasing the ultimate expense that must be borne by either one or the other and, what is even more to the point, he will have a foundation upon which to base instructions for future care of the apparatus. Which is as it should be.

But if the owner still persists in the statement that neither accident or neglect is responsible for the break-down, when manifestly such is not the case, he hits directly at himself. He increases the amount of work the dealer must do to get at the root of the evil, runs up the bill for time that the dealer is quite likely to hold against him and places himself in a position where his veracity on other matters may be ques-

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tioned. It must be admitted that there are cases where electrical equipment just naturally "quits" through no fault of the owner whatsoever, though such cases are so scarce as to be the exception rather than the rule; to put it even more strongly, they are exceptionally scarce. Generally, troubles can be traced to neglect, for as a rule, electrical equipment is so placed on the chassis that ordinary accidents such as slight collisions will not harm it and nothing short of a real disaster will place it hors de combat. Hence, very little illumination is required to make plain that the owner's best course in any event is to make a confidant of his dealer—



REAR VIEW MAGNETO GENERATOR

to tell him exactly "what's what," and his opinion of why it should be so.

When such a course is followed, the dealer is enabled, nine times out of ten, to put his finger directly on the offending part without any preliminary feeling around and without waste of time. And it gives the dealer an opportunity to set the owner's feet in the right path so that future snags can be sighted and passed by safely. It gives him an opportunity to make plain such passages in the maker's instruction book that may have been obscured and to supplement such information with his own experience in dealing with the troubles that are most likely to develop and his manner of averting them.

Simplicity Despite Apparent Complexity.

All of which assumes, of course, that the dealer is "wise" to the system with which his cars are equipped, and in the light of the present the assumption is a perfectly fair one. It can be said with a great deal more truth now than it could have been said a year ago that the average dealer is as well equipped to "doctor" his electric lighting and engine starting systems, mentally and physically, as he is to care for the rest of the car. The principal reason for the change is that all such systems are simple in principle, which fact has been reiterated many times in the nineteen preceding articles treating of the same subject which have appeared in Motor World. And the secondary reason is that that knowledge apparently at last has had time to seep in.

That a real degree of simplicity can and does exist, even where the more or less complicated functions of an ignition generator and a lighting dynamo are combined in a single instrument, is revealed by the accompanying illustrations of the newest Westinghouse equipment of the kind, which show an unusually compact combined magneto and generator in which there are to be found a number of features which are exclusive. Quite as a matter of course, the equipment also includes a starting motor, though there is little of the innovation in that part of the equipment. As either lighting alone, or lighting and ignition, or lighting, starting and ignition can be supplied in one system, and as the generating unit remains the same in either, except for the addition of circuit breaker mechanism, etc., for ignition, description of the combined ignition, lighting and starting system will suffice for all.

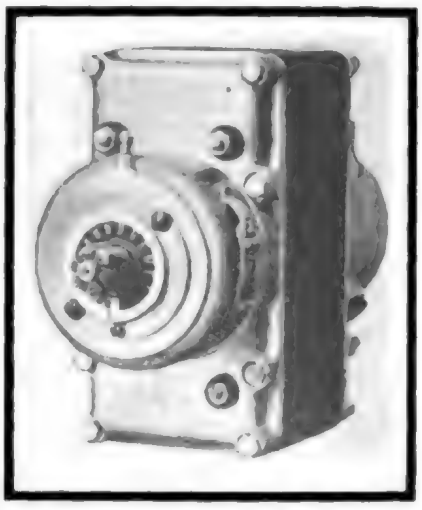
Benefits of Slow-Speed Generators.

In appearance, the generating unit is compact, as may be judged by the accompanying picture, and is completely enclosed to make it impervious alike to dirt and moisture. Furthermore, it is peculiar in that it is designed to operate at slow speed—crankshaft speed in the case of the four-cylinder instrument and 1½ times crankshaft speed for the "six"—which, of course, is necessitated by the fact that it is direct connected after the manner of the ordinary magneto. That is to say, it is driven by a straight-through shaft from the timing gear train in the orthodox manner.

The use of a machine of the type, it is pointed out, has several important advantages, not the least of which is that the height of the center of the shaft is the same as the corresponding height in the ordinary magneto. Thus the combined instrument may be substituted for the other with the minimum necessary amount of change; it is easily mounted and is light in weight; its slow speed, coupled with the method of constructing the armature, effectually precludes the possibility of centrifugal force loosening the windings.

Despite the slow speed at which the armature operates, the capacity of the generator has been arranged to be ample to carry the lighting load without drawing on the battery for power during the time the engine is in operation. When the engine is idle, power is drawn from the battery, of course, just as it is in any other system. The generator is of the straight dynamo type and therefore is devoid of permanent magnets; self-regulation is an inherent feature of construction, there being no outside relays or solenoids or other devices employed. Regulation is effected by connecting the generator to the battery through a reversed compound field winding. Current for the lights does not pass through this field, however, the result being that as additional lights are turned on the current increment increases automatically to supply them.

The operation of the generator naturally is controlled by the automatic cut-out, which, in the larger of the two sizes of



WESTINGHOUSE STARTING MOTOR

generators, connects the battery and the generator at about 325 revolutions a minute and disconnects them when the speed drops to about 225 revolutions a minute, these two speeds corresponding to about 10 and seven miles per hour, respectively, in the average four-cylinder car. For the smaller generator, the cut-out operates at 375 and 275 revolutions, for "in" and "out," respectively, the difference in speed in either case being sufficient to obviate the continuous operation of the device at critical speeds.

Characteristics of Current Supply.

Hence, with the battery connected to the generator at 325 revolutions a minute, for the larger instrument, the current rises very rapidly with the speed until a value of from 5 to 7 amperes is obtained, if the lamps are not burning. Above this value, the charging current increases very slowly in proportion to the increase in engine speed, though in no case can it rise to the point where the charging current becomes excessive. If, with the generator charging the battery, the lamps are turned on, the output of the machine automatically is increased to care for the lighting load without disturbing the charging current and without drawing on

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the battery at normal speeds. Of course, at low speeds, the battery must be expected to furnish part of the lighting load for that is one of its functions.

The automatic cut-out is of the usual electro-magnetic type and operates to close the circuit between the generator and the battery immediately the output of the former exceeds the output of the latter. When the engine speed is slowed down until the generator output is less than the battery output the reversal of the current through the cut-out coils operates to open the switch, thus preventing the battery discharging itself through the generator. The action is entirely automatic and the device is so constructed that it need never be touched from one season's end to the next.

Advantage of Twin Breaker Contacts.

The construction of the generator itself, barring the circuit breaking mechanism of the ignition portion, is orthodox in pattern. The wiring is treated with heat and moisture-resisting paint and virtually is a solid mass that cannot be harmed except in the case of disastrous accident. The armature is of the laminated drum-wound type and is especially treated to withstand temperatures up to 250 degrees Fahr.

In those types of instruments in which a source of current for ignition also is supplied, the system is a true dual one. Which is to say, the battery represents an individual source of supply and operates through the same interrupter and coil as does the generator. The most unusual portion of the mechanism is in the form and construction of the circuit breaking apparatus, which, as may be seen by the accompanying illustrations, includes two contacts instead of the one which usually serves. These two contacts are placed in series with each other, the theory being that the voltage, and consequently the sparking, at the individual points thus is greatly reduced.

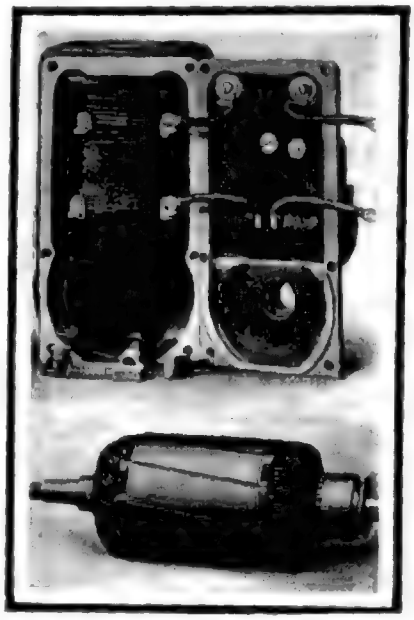
Unusual Feature in Automatic Advance.

The interrupting mechanism also is unusual in that it is arranged to maintain the period of contact practically constant regardless of speed; at the same time, the time of ignition automatically is advanced as the speed of the engine increases, the action of centrifugal force on two movable weights being relied upon to create this feature. The distributer is of the usual magneto type, but has been especially designed so that the body portion can be put in place without interfering with the contact brush and without the necessity for special tools. The body portion is formed of a highly insulating heat resisting composition that will not soften under heat. The coil for stepping up the voltage to high tension is of the usual dash type except that the core is constructed of silicon steel to increase its efficiency and permit the generation of unusually hot sparks.

The starting motor of the Westinghouse system, like very nearly every other starting motor, is of the familiar series wound type in which the torque increases with the load up to the stalling point. And like all other starting motors, its care can be expressed in the words: "Keep it clean." Individual instruction in the care of the motor is the same as for the care of the generator, except that, naturally, the motor will not require as much attention as will the generator for the reason that it is in use but a small part of the time.

Accessibility of Generator's "Insides."

Despite the apparent complication added



WESTINGHOUSE GENERATOR VITALS

by the ignition apparatus in the Westinghouse generator, it is no more difficult to get at its "insides" for cleaning and to take care of it in general than it is to get into the average generator not equipped to supply ignition sparks. As may be seen by the accompanying picture, the vitals may be exposed by removing six screws when the whole armature, brushes and all, can be removed intact. Obviously, however, such drastic treatment will not be necessary, except at long intervals. In the mean time, it is a comparatively simple matter to clean the commutator by removing the brushes and covering their ends with tiny squares of No. 00 sandpaper cut to fit and replacing them. Then if the engine is started and permitted to run for, say, a couple of minutes that is all that will be required. Needless to add, the interrupter and distributer need be touched not more than are the same parts of the ordinary magneto, which is never; they are constructed to operate indefinitely without any attention whatsoever.

To get at the "vitals" of the starting motor, which always may be taken to mean the commutator and the brushes, is even simpler than in the case of the generator. It merely requires that a metal strap be removed, the unlatching of a catch serving to loosen it; the arrangement is clearly shown in the accompanying illustration of the motor. In the picture, there also is apparent a tiny oil fixture at the top, and the size of the fixture may be taken as an indication of the amount of lubricant that should be applied. Not more than a few drops of fine oil at a time ever should be used; and the applications should not be made more frequently than once every 500 miles or so.

Fuse Block as a Trouble Finder.

As the Westinghouse system is equipped with a fuse block and fuses, it follows, as often has been made plain before, that the first place to look for trouble in the event of failures either in the lighting or the starting circuit, is in the fuses. Obviously, if the fuses are burned out, current cannot be passed, and the mere fact that a fuse is burned out may be taken to indicate a short circuit somewhere in the line, the exact location being marked by the fuse itself. Needless to add, the short circuit always must be located before a new fuse is inserted for the burned out one. Also contained within the fuse block and placed between the fuses, there is a small resistance coil, or equalizer, the duty of which is to reduce the amount of current fed to the side lamps when the head lamps are not lighted. If unprotected in this way, excess current might burn them out.

Care Needed in Choosing Lamps.

Reducing the possibility of current leakage to the minimum, the system is designed to operate on six volts, which voltage has been chosen by reason of its widespread use and the comparative ease of obtaining lamp replacements. In this respect, it behooves every owner of an electric lighting system to ascertain the style of base fitted to his lamps before purchasing "spares." As a rule, the Ediswan, or bayonet, base is employed, this type having been recommended by the Society of Automobile Engineers. It differs from the Edison base, such as commonly is used for house and store lighting in that it has no screw threads. Hence, there is an important difference between the two types; one cannot be made to fit a socket constructed to fit the other, which fact must be borne in mind if inconvenience on the road in trying to make one kind of lamp fit another kind of a socket is to be avoided.

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1,024,431. Vehicle Tire. Theodore H. Banks, San Antonio, Tex. Filed Oct. 23, 1911. Serial No. 656,221. (Springs of strip steel in a flexible casing.) 1 claim.

1,024,440. Engine. Jackson G. Crowdes, Boston, Mass. Filed Nov. 25, 1910. Serial No. 594,005. (Modified sleeve valve motor.) 1 claim.

1,024,447. Starting Device for Internal Combustion Engines. Edward A. Halbleib, Rochester, N. Y., assignor to Northeast Electric Company, Rochester, N. Y., a Corporation. Filed Sept. 6, 1910. Serial No. 580,785. (Combined air and ignition starter.) 4 claims.

1,024,579. Crank Case. Russell Huff, Detroit, Mich., assignor to Packard Motor Car Company, Detroit, Mich., a Corporation of Michigan. Filed Aug. 7, 1911. Serial No. 642,712. (Ducts moulded in base of case comprise means of conducting lubricant.) 14 claims.

1,024,618. Explosion Engine. Howard E. Coffin, Detroit, Mich. Filed June 27, 1910. Serial No. 569,063. (Rotary disk valve.) 7 claims.

1,024,634. Convertible Automobile. Albert Klell, West Park, Ohio, assignor of one-half to Henry Baraes, Cleveland, Ohio. Filed Sept. 21, 1910. Serial No. 582,968. (Knock down limousine body.) 2 claims.

1,024,636. Side-Dump Autotruck. George Washington Lally, Boston, Mass. Filed Apr. 9, 1910. Serial No. 554,505. (Motor operates the dumping mechanism.) 7 claims.

1,024,652. Motor Road Vehicle. Frederick Henry Royce, Derby, England. Filed Oct. 28, 1911. Serial No. 657,342. (Cantilever type of spring.) 1 claim.

1,024,658. Folding Storm Front for Automobiles. James E. Stevenson, Puyallup, Wash. Filed Oct. 19, 1909. Serial No. 523,532. (Windshield that can be folded to lie flat against the dash.) 1 claim.

1,024,710. Sparking Igniter. Luther H. Wattles, Providence, R. I., assignor of one-half to Matie C. Messler, Pawtucket, R. I. Filed Dec. 3, 1910. Serial No. 595,422. (Magnetic plug.) 18 claims.

1,024,711. Internal Combustion Engine. Harry Whidbourne, Plymouth, and John James Lishman, Salcombe, England. Filed Aug. 24, 1911. Serial No. 645,820. (Two-cycle motor with double diameter piston.) 3 claims.

1,024,712. Engine Starter. William H. Williams, Statesboro, Ga. Filed Jan. 30, 1912. Serial No. 674,311. (Clutch for mechanical starter.) 4 claims.

1,024,727. Lubricating System for Motors. Russell Huff, Detroit, Mich., assignor to Packard Motor Car Company, Detroit, Mich., a Corporation of Michigan. Original application filed July 2, 1909. Serial No. 505,735. Divided and this application filed Dec. 14, 1911. Serial No. 667,700. (Combined force feed and splash system.) 6 claims.

1,024,746. Demountable Wheel Rim. Harry Hine Replogle, Montreal, Quebec, Canada. Filed Apr. 22, 1910. Serial No. 556,983. (Means for attaching demountable rim.) 2 claims.

1,024,753. Resilient Tire. Jacob Thissen, Kane, Pa. Filed Sept. 6, 1911. Serial No. 647,991. (Helical springs enclosed in a flexible casing.) 1 claim.

1,024,817. Crank Shaft. Horace L. Arnold, New York, N. Y. Filed Oct. 7, 1909. Serial No. 521,506. (Built up crank shaft.) 3 claims.

1,024,834. Spark Plug. Louis J. Dirand, Torrington, Conn., assignor of one-half to Charles H. Carlin, Torrington, Conn. Filed Nov. 20, 1907. Serial No. 402,998. Renewed Aug. 30, 1911. Serial No. 646,846. (L shaped slot provides means for quickly removing core.) 7 claims.

1,024,862. Internal Combustion Engine. Ernst Moewes, Marienfelde, near Berlin, and Alfred Vischer, Cannstatt, Germany, assignors to The Firm of Daimler Motorengesellschaft, Unterturkheim, near Stuttgart, Germany. Filed Jan. 7, 1911. Serial No. 601,423. (Lubricant supply valve operated with the throttle valve.) 5 claims.

1,024,935. Portable Faultfinding Device for Electrical Ignition Apparatus. Samuel P. Hedges, Greenpoint, N. Y. Filed July 26, 1910. Serial No. 573,937. (Transparent chamber for testing plugs under compression.) 1 claim.

1,024,976. Resilient Tire for Vehicle-Wheels. Alfred A. Curry, Bridgeport, Conn. Filed June 13, 1911. Serial No. 632,832. (Springs between non-yielding rim and felloe.) 4 claims.

1,024,977. Spring-Wheel. Elvin Fast, Sheffield, Ala. Filed April 27, 1911. Serial No. 623,665. (Helical springs in telescoping spokes.) 3 claims.

1,025,038. Motor-Car Seat. Ludwig Wilkening, Hanover, Germany. Filed Feb. 15, 1910. Serial No. 543,999. (Seat supported on a framework of strip spring steel.) 1 claim.

1,025,070. Speedometer. Robert Bertin Auguste Lemaignen, Rouen, France. Filed June 11, 1910. Serial No. 566,402. (Clock mechanism records the number of wheel revolutions in a given time.) 17 claims.

1,025,105. Locking and Controlling Means for Turning Plugs. Fred Elliott Youngs, Detroit, Mich. Filed July 8, 1908. Serial No. 442,543. (Lock positioned on dash controls cock in fuel pipe.) 13 claims.

1,025,159. Chain-Guard for Vehicle-Wheels. Conness T. Raymond, Chicago, Ill., assigner of one-half to John W. Pax, Chicago, Ill. Filed Jan. 18, 1909. Serial No. 472,834. (Means for removing cross-chain members of a non-skid chain.) 2 claims.

1,025,180. Lever-Locking Device. William B. Wreford, Detroit, Mich. Filed Dec. 13, 1910. Serial No. 597,038. (Lock for steering gear controls.) 3 claims.

1,025,187. Motor-Vehicle. Russell Huff, Detroit, Mich., assignor, by mesne assignments, to Packard Motor Car Co., Detroit, Mich., a corporation of Michigan. Filed Aug. 28, 1907. Serial No. 390,494. (Formation of rear portion of the body.) 6 claims.

1,025,188. Gearing for Motor-Vehicles. William D. Hughs, Atlanta, Ga. Filed March 15, 1911. Serial No. 614,715. (Spring device for automatically shifting gears when clutch is released.) 11 claims.

1,025,215. Universal-Jointed Automobile Steering-Rod. Jacob H. Stull, Fremont, Ohio. Filed October 31, 1910. Serial No. 589,852. (Universal joint at base of column permits angle of post to be altered.) 2 claims.

1,025,216. Lever Control for Motor-Vehicles. Alfred T. Sturt, Flint, Mich., assignor to Buick Motor Co., Flint, Mich., a corporation of Michigan. Filed Sept. 1, 1911. Serial No. 647,199. (Control levers enclosed in the framework of the door.) 8 claims.

1,025,232. Spark-Plug for Internal-Combustion Engines. Vincent G. Apple, Dayton, Ohio. Filed Aug. 3, 1906. Serial No. 329,031. (Electrode fused into insulating bushing.) 1 claim.

1,025,233. Spring for Vehicles. Herbert Austin, Barnt Green, near Birmingham, England. Filed April 14, 1909. Serial No. 489,780. (Means for attaching to axle and body and for shackling.) 5 claims.

1,025,251. Engine-Cooling Device. John Desmond, Chicago, Ill., assignor to William S. Potwin, Chicago, Ill. Filed Aug. 8, 1910. Serial No. 576,035. (Aspirator attaching to exhaust pipe causes air circulation through cylinder jacket.) 1 claim.

1,025,287. Means for Loading and Unloading Trucks. Charles Mattson, Bremerton, Wash. Filed Oct. 5, 1911. Serial No. 653,033. (Traveling crane fitted to truck.) 2 claims.

1,025,315. Fluid-Spring for Vehicles. Frank Schreidt, Mansfield, Ohio. Filed February 20, 1911. Serial No. 609,842. (Pistons operating in cylinders into which liquid is free to enter, but blocked in passing out.) 7 claims.

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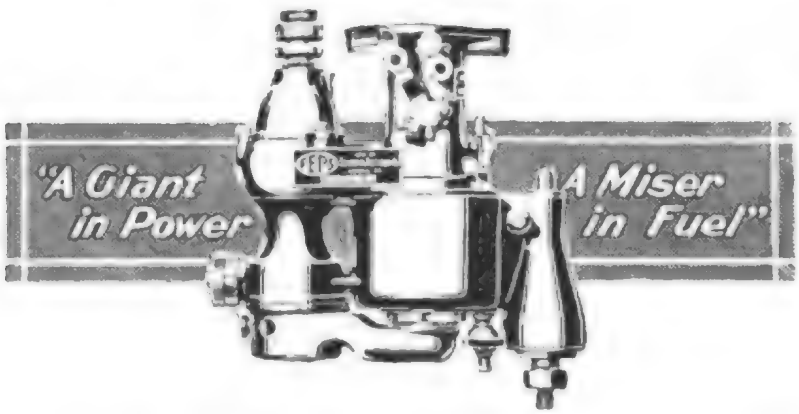
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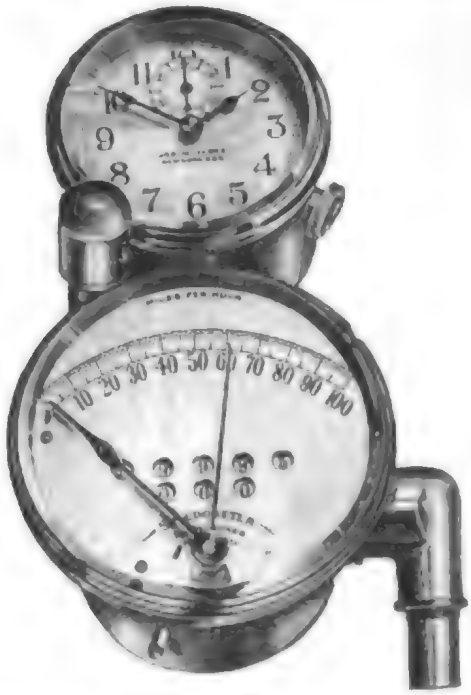
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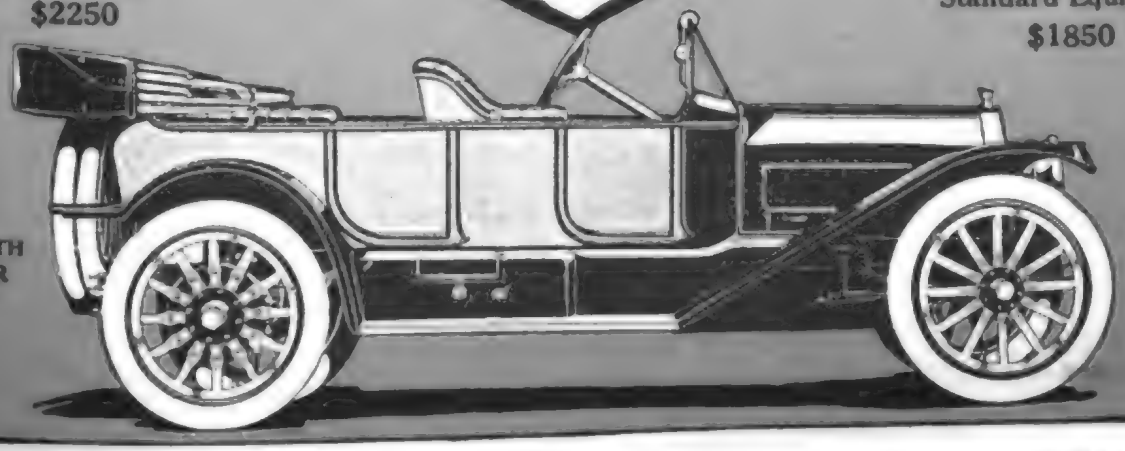
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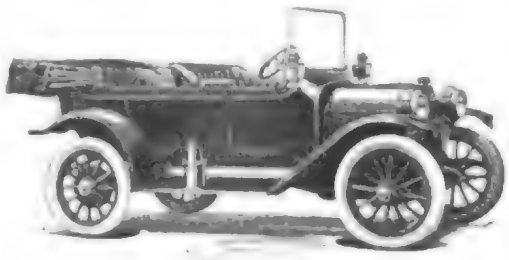
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With Speedometer Problems Which Involve Special Design to Conform With Certain Car Design.

Standard Equipment o

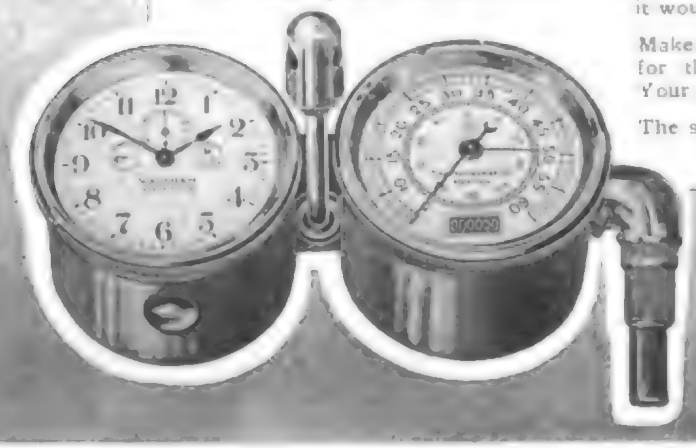
Our engineering department is made up of experts, fitted by technical education and training to help you in the work of getting the right recording instruments on the right cars. The brains, ability, and equipment are right here.

This feature of our business is specialized. It is part of our organization. We have made a study of co-operative design and so the service we render is particularly valuable to car designers.

This department is yours to command. Here we will co-operate with you in the designing of driving equipment and any out-of-ordinary form of installation to meet your own special requirements—and we will do it as quickly and perhaps better than it would be done elsewhere.

Make our designing department part of yours for the time being. Combine these forces. Your results will be positive and correct

The service involves no cost to you



THE HOFFECKER CO.
MOTOR MART
Main Office, Boston, Mass.

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WALTHAM TIMEPIECES

HOFFECKER IS TO A SPEEDOMETER
WHAT WALTHAM IS TO A TIMEPIECE

DEALERS

The Entire National Car Output is Coming Through Hoffecker-Waltham Equipped. What is the Answer?

1913 National Car Output

The quality of the National car is established and recognized, for its designers have bought parts and accessories of quality to guarantee service from tires to top. They buy as well as manufacture, integrity of product.

They selected Hoffecker speedometers and Waltham time pieces, relying on them to add still more to National prestige. Quality came first—price was secondary. We furnished the ideal combination.

When you specify the Hoffecker-Waltham combination on the cars you sell, then you serve your customers well. You assure them of another high grade standard feature—one they know about and want.

Always bear in mind that your customer or your car manufacturer can pay more for a speedometer or time piece—but no amount of money can buy more accuracy and durability than are inherent in our sensibly advertised, splendidly built products.



THE WALTHAM WATCH COMPANY
Waltham Mass.

Warner
AUTO-METER

(MAGNETIC PRINCIPLE)

¶ We have more money invested in service stations alone than most speedometer manufacturers have in their factories.

¶ We have more people employed at our branches than most speedometer manufacturers have at their factory.

¶ Manufacturers, dealers and car owners alike know the value of such service.

¶ Warner Auto-Meters and Warner service are and always have been synonymous of permanency; they are the universally acknowledged standards in the accessory field.

Warner Service Stations are permanently maintained in all large cities

Warner Auto-Meter Factory, Beloit, Wisconsin



Model O-2
Price $145

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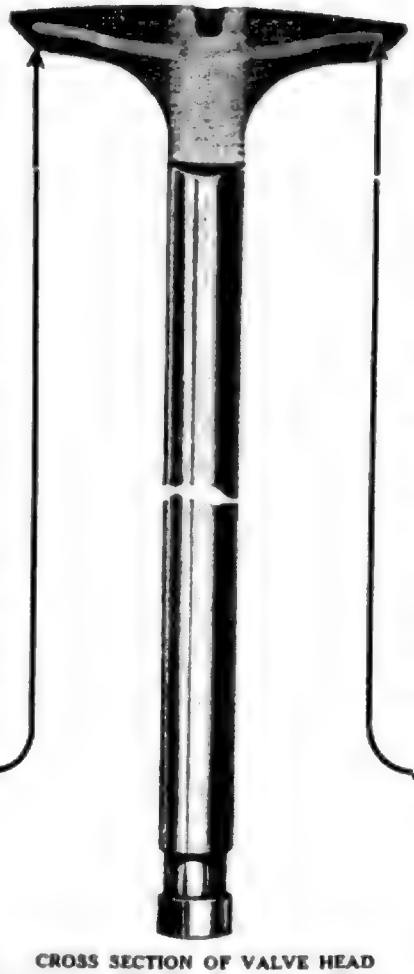
If You Use Cast Iron Valves

This reinforced head will give you greater strength and longer service than any other type of cast iron head

Cast Iron Head

It resists the tendency of the heat to warp it out of shape.

The seat of the valve does not pit easily and will run for months without regrinding.



CROSS SECTION OF VALVE HEAD
The iron is cast onto the disc and stem by a special process making disc, head and stem one solid piece.

Strong Steel Disc

The saucer shaped disc reinforces the cast iron giving the head the necessary strength to stand the severe service.

It does away with the frequent breakage common to all cast iron valves.

The unique features in the construction of this valve are the result of long experience in valve making and careful study of the conditions under which the valve operates.

The valve is given two scientific heat treatments under the direction of an expert metallurgist and automobile engineer.

Every step in its manufacture is supervised by an organization which makes over 2,000,000 gas engine valves per year.

This valve can be made in a design to suit your motor.

Send your blue prints for quotation.

THE ELECTRIC WELDING PRODUCTS CO.

CLEVELAND, OHIO

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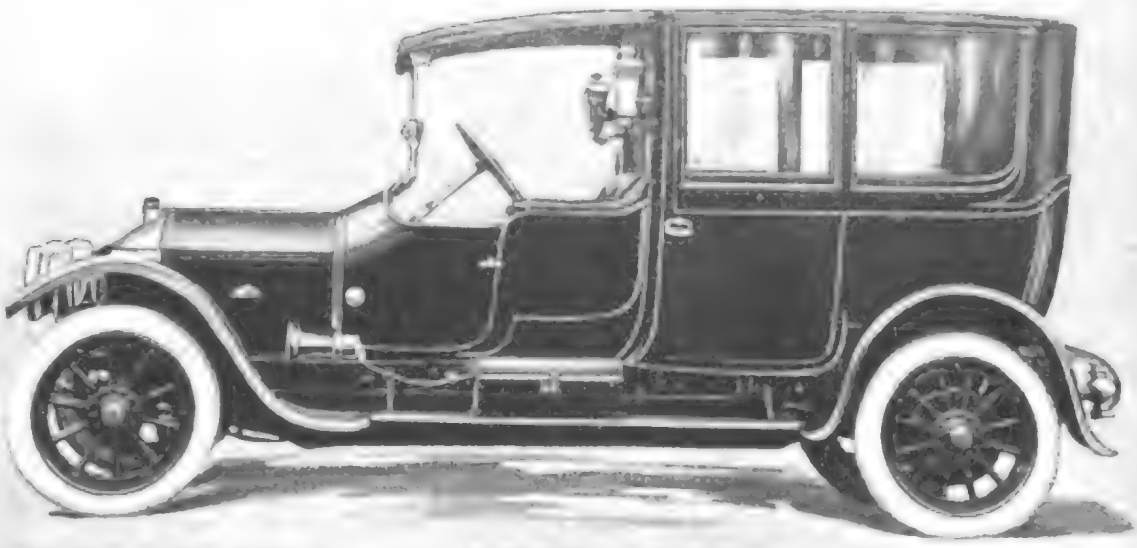
Exclusive in any Community

METALLURGIQUE

Will Sell in Your Community

DEALERS

The European Car Idea is Growing in America — is your Ear to the Ground



Dealers who read this announcement will do well to consider the advisability of forming an agency connection with us for handling the Metallurgique—a car for the classes—a distinct and exclusive product, sensational in body design, equipment and appointment. These cars are limited in quantity—unlimited in quality.

From the radiator of unique design to the end of the rear springs—from tire to top, this powerful, unbreakable car offers value in service away beyond that of any other European or any American product. There is a selling argument in every item from steering knuckle to engine.

Luxury of appointments are regal—beauty of design and finish supreme on both sides of the water. Service unlimited.

The Metallurgique is the only logical car for men of wealth and position who desire an equipment that will make all others appear commonplaec.

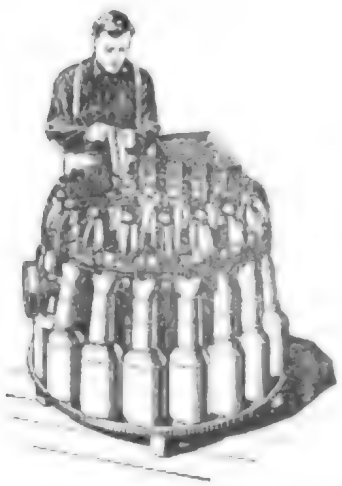
Let us help you find and please and sell to those in this class. As a preliminary, write and get the literature and terms. We can throw more light on the Metallurgique, Europe's choicest product.

THE METALLURGIQUE MOTOR CO., 1934 Broadway, New York

W. C. and H. N. ALLEN, Proprietors

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Hunting the Quarter Thousandth of an Inch
No. 1 A Tale of Sixteen Traps



¶ Every tapered roller of the Timken Bearing runs the gauntlet of the sixteen traps!

¶ Trap No. 1 catches one size only. A roller one quarter of the thousandth part of an inch(.00025") smaller than that size can't spring trap No. 1. But trap No. 2 is sure to get it! Trap No. 3 finds the next smaller size; and so on, by quarters of thousandths of an inch to trap No. 16.

¶ The traps lie 'round the disc of a Timken-made machine that sorts the rollers into eighteen lots. First lot too large; last lot too small; sixteen in between. All the sixteen are right, and each lot varies from the next by one fourth the thousandth of an inch. Each lot, too, goes into a separate canister which is sealed until used. So a workman who assembles the rollers on the cone *knows*, when he opens a canister, that every roller in it is the size of every other roller.

Timken Tapered  **Roller Bearing**

Reason for the Traps

¶ Thus you can be certain that each one of the rollers in a Timken Bearing takes its share of the load—no more, no less. There is no 'high' roller to stand extra strain and get extra wear. There is no 'low' roller to loaf and throw its share of burden on the neighbors.

¶ There are roller gauging machines in the Timken Plant to sort out every size of roller used in every size of the Timken Bearing. Sixteen sizes to each machine. And the sorting is done automatically by the sixteen traps. Frail human judgment is eliminated.

Gives an Added Value

¶ Time was when the gauging of Timken Rollers was left to human eyes and hands. Yet even in those days the unique Timken principle of tapered rollers revolving between a tapered cup and a tapered, two-ribbed cone gave a bearing that did what no other type of bearing could do.

¶ With the progress of the years such refinements in the making have added to the worth of right design an extra value in a still longer life of satisfactory service.

The Timken Roller Bearing Company

Canton, Ohio, U. S. A.

The only axle manufacturer licensed to make automobile axles equipped with Timken Roller Bearings is the Timken-Detroit Axle Company

118

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This Ad. Deals with the Subject of Shortage of Sixes for 1913

FOR, OF COURSE, THERE'S GOING TO BE a shortage of Sixes. Nothing could be more certain—nothing is giving the trade more concern at this moment. Dealers are worried and prospective buyers are beginning to be.

THIS AD. IS PUBLISHED in all the principal newspapers east of the Mississippi, Sunday, February 23rd. Seven days from now is March 1st—then comes the deluge.

FOR PAST EXPERIENCE TEACHES us that with the coming of March comes also the tremendous spring demand. The condition that is, at the same time, the most welcome and yet the most dreaded by makers whose product, as ours, enjoys a ready sale.

WE WELCOME IT BECAUSE it means big business—and we dread it because we know it also means disappointment to many good customers—bitter disappointment to some.

IT ALWAYS HAS BEEN SO—it probably will continue to be so. Tardy buyers are bound to be disappointed. Yet among the tardy buyers are many good friends who have always depended upon this organization to furnish them automobiles of more advanced design, of a better quality and at a lower price than could be had elsewhere.

TARDY BUYERS ARE NOT TO BLAME for being tardy. Mostly they are too busy with other matters, or are unfamiliar with things automobile. Anyway, they are liable to believe there will be plenty of cars to go around.

PERHAPS THERE WILL BE—BUT there never has been, and those best competent to judge know that the shortage of the kind of cars you want will be greater this year than ever before.

GET THAT! THERE MAY BE plenty of cars. But there won't be plenty of Sixes, and there will be still less of the kind of Sixes that will measure up to the standard of the man who knows—and we are assuming that you are one of these.

WE ARE NOT INTERESTED so much in the man who doesn't know. We are not making cars to meet that demand.

BUT WE ARE VITALLY INTERESTED in those who do know. They are the readiest buyers of cars that do measure up to their standards—and the best customers afterward.

THAT'S WHY WE ARE PUBLISHING THIS AD—to warn those who know and who are going to insist on having a Six, that there is not only going to be a shortage of Sixes generally, but a discouraging shortage of Sixes of that kind.

LET US REPEAT—This ad. is only for those who know what does and what does not constitute a successful Six. Those, in short, who know what they want—want what they want—and who will not accept a substitute. And we repeat, we are assuming you are one of these.

NOW LET'S GET DOWN to brass tacks.

FIRST LET US SEE WHY there is a shortage of Sixes. Reason is simple—greater demand than possible supply. Why? Because buyers came to realize the superiority of Sixes sooner than most makers.

THE IMMEDIATE RESULT of our sensational announcement—aside from the impression it made on prospective buyers—was to upset all carefully made plans of competitors. There were conferences, meetings of the "Ways and Means Committees," and anxious discussions between directors and engineers. The problem was, how to meet the new conditions—how to meet the insistent demand for Sixes.

FOR YOU MUST KNOW that while all makers foresaw the conquest of Sixes in all cars of 40 horsepower or over, most of them agreed that, except in cars of the highest price (say, $4,000 and over), buyers would be willing to accept "Fours" for yet another season. There's where they miscalculated, and the matter had suddenly assumed a very serious aspect.

THE PROBLEM THAT CONFRONTED THEM was how to produce Sixes to meet the insistent demand. And most of them went about it by the shortest and most obvious route.

NOW GET THIS—IT'S VITAL. Demand always creates supply. The Six demand was no exception. It resulted in a supply of Sixes—but not the kind of Sixes you want if you know the difference between what constitutes a successful Six and the other kind. And we are assuming you do.

MANY CARS ARE OFFERED under the name of Sixes—but most of them are only converted Fours.

"WHAT IS A CONVERTED FOUR?" you ask. And we are glad you ask, because we know the answer. A "converted Four" is a Six that has been hurriedly produced to meet an unforseen demand, by the simple process of adding two to the Four the maker already had.

THAT'S SIMPLE, ISN'T IT? It's the obvious—in fact, the obviously obvious way to do it.

BUT "IT SIMPLY CAN'T BE DID." You can produce a "Six," but not a successful Six that way. There are engineering problems in a Six that do not arise in the designing or making of a Four. Space does not permit us to enter into this important matter in detail here, much as we should like to do so. For it is important—vitally important to the buyer.

WE HAVE, HOWEVER, TREATED THIS matter exhaustively in a little booklet, which we will be glad to send you, the title of which is "Two Added to Four Do Not Make a Six."

IF YOU WANT TO KNOW about Sixes so as to be able to choose intelligently, you'll find more real information in this booklet than you'll get elsewhere. And it's authentic. Without being too highly technical, its contents emanated from the engineer who knows, perhaps, a little more about designing Sixes than any other in this industry. He's the man who designed the Maxwell "50-6."

BETWEEN THE LINES we tell you wherein and why the Maxwell "50-6" is superior. But you are just as much interested in learning that as we are in telling you. Its perusal will be worth while—you'll be able to tell the average salesman more than he knows about Sixes, and once you've digested its contents, you will be able to tell, by simply lifting the hood, which is a "converted Four" and which is a true Six—designed from the ground up as a Six.

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OR, TO PUT IT ANOTHER WAY; buyers learned the advantages of Sixes sooner than most makers thought they would. Makers knew all the time, but didn't think the average buyer was aware of it.

WE PLEAD GUILTY to having precipitated the trouble. And here's how it happened: in our advertisement announcing the sensational Maxwell "50-6" (then the Flanders "50-6") we said, "If You Are Paying More Than $1,200 for a Car, You Are Entitled to a Six."

AND WE TOLD YOU WHY. And you and all the rest of the automobile buying world understood—evidently; for a landslide followed immediately after. Buyers began to demand and to insist on Sixes in all cars from $1,200 upward. And as always happens, dealers echoed the demand of buyers.

NOW YOU'LL RECALL, WE DIDN'T say we had a Six at $1,200; but we did announce the five-passenger Maxwell "40-6" at $1,550 at the same time we announced the seven-passenger Maxwell "50-6" at $2,350. And we predicted that the man who knew would decide he would rather pay the difference and have a Six than have an obsolete "Four" at the lower price.

WELL, EVENTS PROVED that we were right. And it didn't take long, either. In fact it happened in a remarkably short space of time. Most makers were caught unawares. That's why we have termed it "an avalanche."

INCIDENTALLY, WE SUDDENLY BECAME very much disliked in the trade. We had committed the unpardonable sin of telling the buyer something that other makers protested was "none of his business." However, we will probably survive that. We're used to it.

WHAT WE ARE UP AGAINST—and the only thing that really matters to you or to us—is the fact that there aren't enough Sixes to go around. We know it. Everyone in the trade knows it. And we are telling you.

AND WHILE WE ARE TELLIN', LISTEN!—for here's something perhaps you didn't know.

MEANTIME, YOUR CHIEF CONCERN is how to get your Six, despite the shortage of Sixes generally, and especially of the type of Sixes you want—Sixes that have been designed by makers who believe in Sixes and who know how. That's your only concern.

ANSWER IS, GET IN LINE QUICKLY—see your local dealer and place your order, specifying delivery when you will want the car—and you will get it while others will be waiting and cussing as in years past because makers cannot make enough of the kind of cars that are in most demand.

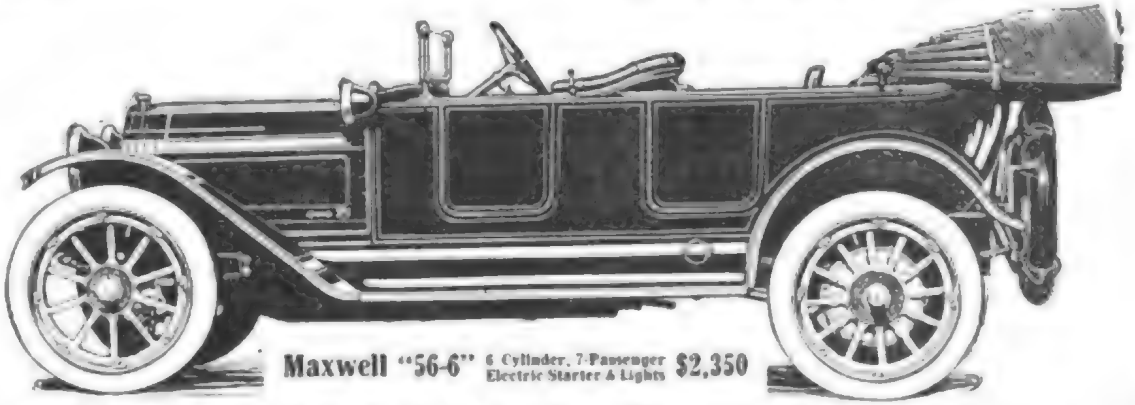
YOU'VE NOTICED, DOUBTLESS, that we have said little in this Ad. about our own particular product—Maxwell Sixes. Reason is we don't need to. When, by a process of elimination, you have excluded from your consideration the converted Fours and other Sixes that do not come up to your standard, there will be few left to select from—and foremost and most desirable among these few will be the Maxwell "50-6."

THE MAXWELL "50-6" is a car of such power, such beauty, such capacity and of such quality throughout, as you had expected to pay at least $4,000 for—and we contend it cannot be equaled even at that price.

BODY DESIGNED BY BRUCE OTT and already being copied by other makers. Motor designed by William Kelly, one of the earliest advocates of the Sixes and an engineer who is recognized by his contemporaries as one of the foremost, if not, indeed, the foremost authority on six-cylinder cars.

OUR PRICE ($2,350) is made possible only by our superior manufacturing facilities and the fact that we are the largest makers of Sixes.

IF YOU HAVEN'T SEEN and ridden in this magnificent car, you owe it to yourself to do so at once. There isn't a day to lose. Orders placed within the next ten days will be sure of delivery almost on the day specified. After that, we don't know. Each buyer will have to take his own chance.



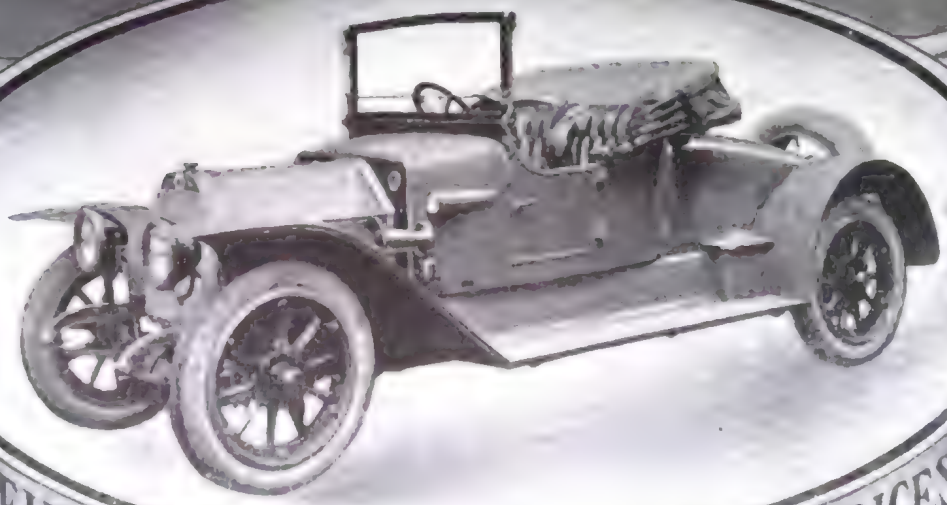
Maxwell "56-6" 6 Cylinder, 7-Passenger Electric Starter & Lights $2,350

THE MAXWELL MOTOR COMPANY, Detroit, Michigan

MAXWELL BRANCHES:

New York, N. Y.	Chicago, Ill.	Detroit, Mich.	Pittsburgh, Pa.	Atlanta, Ga.	Denver, Colo.	Portland, Ore.
Boston, Mass.	St. Louis, Mo.	Kansas City, Mo.	Omaha, Neb.	Charlotte, N. C.	San Francisco, Cal.	Memphis, Tenn.
Philadelphia, Pa.	Minneapolis, Minn.	Dallas, Texas.	Des Moines, Ia.	Indianapolis, Ind.	Los Angeles, Cal.	

WARNING:—Dealers with good intent sometimes oversell their allotment, hoping by extra pressure on the factory to get a few more cars of the popular types. In the case of Maxwell sixes for 1913 this is dangerous. We have allotted to dealers (and there are over 1,000 Maxwell dealers) every six we can hope to make, even with our tremendous facilities. Buyers will do well, therefore, to insist on knowing how many sixes the local dealer has been allotted, and how many he has sold. Also, we are informed, some dealers are claiming to represent the new Maxwell line who have not been authorized. If in doubt, write us and we'll tell you frankly. Then place your order, pay a cash deposit to bind the sale, get a definite delivery date—and you are secure. Your car will be delivered within ten days of the date specified, if not on the exact date. But get the order in at once.



EUROPE'S MASTERPIECE AT AMERICAN PRICES

Lancia

Canvas your territory and you will find therein men of fine discrimination who understand and appreciate the exclusive features of European car design and construction, but who are deterred from buying, owing to the excessive cost of these products.

Study the lines of the Lancia car shown here. Write to us for complete details concerning these and other models, then go to those whom you think may be interested and explain to them that *they can buy these masterpieces of European design at American prices.*

Write and get our interesting dealer proposition, remembering always that we do not ask you to sell a foreign car at an extraordinary price—but at a price within reason and possible for the pocket books of a great portion of your trade.

ADAMS-LANCIA COMPANY
238 West 58TH Street NEW YORK CITY

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Almost Lost in the Tide of Traffic!!

SHELDON TO THE RESCUE

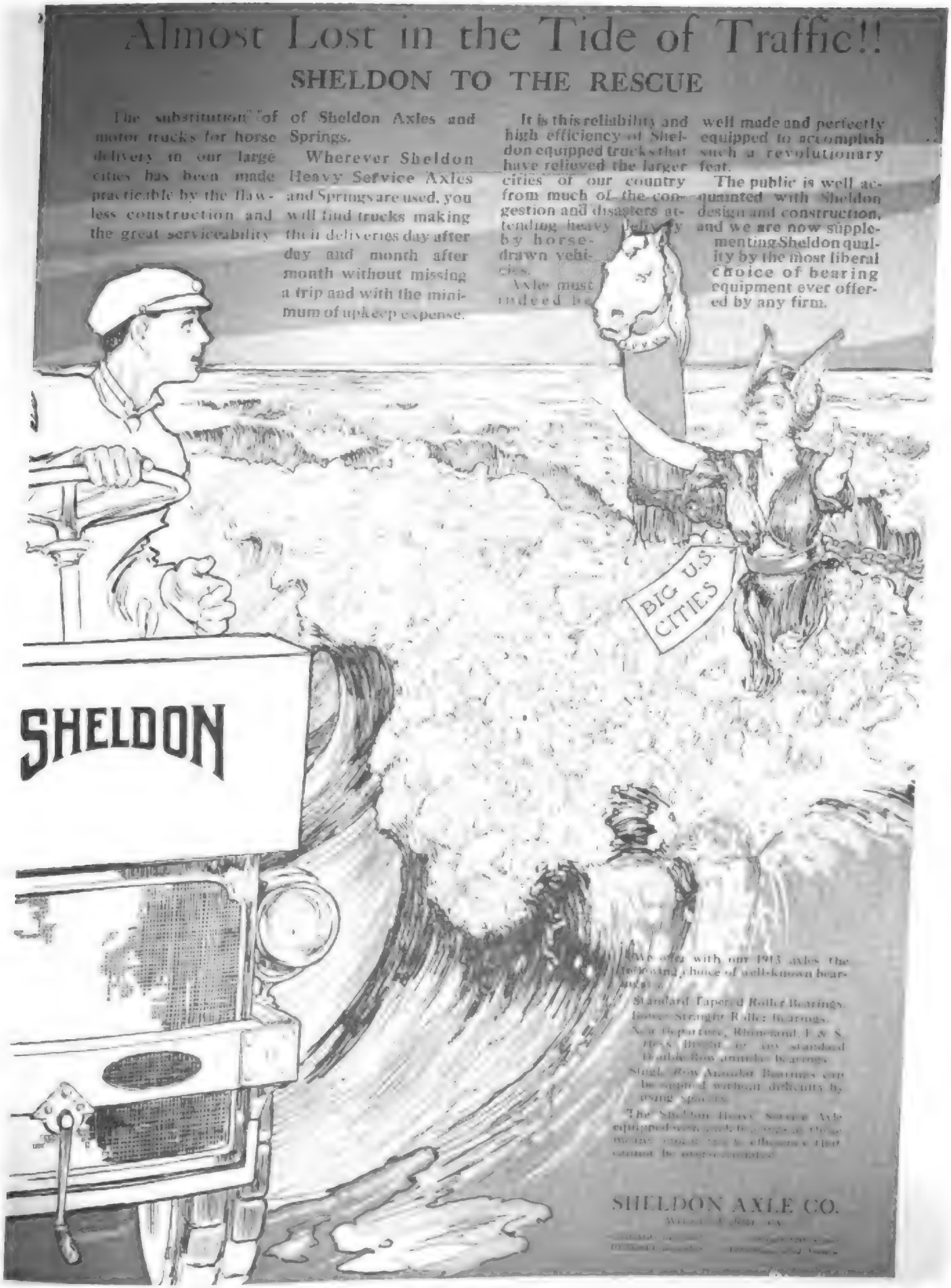
The substitution of motor trucks for horse delivery in our large cities has been made practicable by the flawless construction and the great serviceability of Sheldon Axles and Springs.

Wherever Sheldon Heavy Service Axles and Springs are used, you will find trucks making their deliveries day after day and month after month without missing a trip and with the minimum of upkeep expense.

It is this reliability and high efficiency of Sheldon equipped trucks that have relieved the larger cities of our country from much of the congestion and disasters attending heavy delivery by horse-drawn vehicles.

Axle must indeed be well made and perfectly equipped to accomplish such a revolutionary feat.

The public is well acquainted with Sheldon design and construction, and we are now supplementing Sheldon quality by the most liberal choice of bearing equipment ever offered by any firm.



We offer with our 1913 Axles the following choice of well-known bearings:

Standard Tapered Roller Bearings.
Heavy Straight Roller Bearings.
New Departure, Rhineland, F & S, Hess Bright or any standard Double Row annular bearings.
Single Row Annular Bearings can be supplied without difficulty by using spacers.

The Sheldon Heavy Service Axle equipped with [illegible] bearings [illegible]

SHELDON AXLE CO.

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WHY DO THEY SMILE?

IT'S A Knox "LITTLE-SIX"



"IF YOU HAVE NEVER DRIVEN ONE UP A HILL YOU HAVE MISSED HALF THE SPORT OF MOTORING"

CATALOGUE MAILED ON REQUEST

KNOX AUTOMOBILE CO.

SPRINGFIELD, MASS.

NEW YORK BRANCHES CHICAGO

Another Feature that Contributes to the *Absolute* Accuracy of the

CORBIN-BROWN SPEEDOMETER



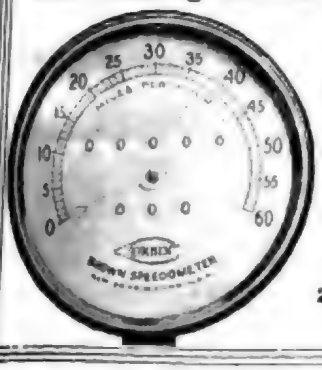
It is an unquestioned fact that the construction of the flexible shafting is responsible for much of the inaccuracy and unreliability of speedometers in general.

There is too much friction in the casing—or friction is minimized at the cost of durability.

The Corbin-Brown flexible shafting overcomes these faults.

It consists of a succession of eye-links and solid links as shown in illustration.

The solid link gives a smooth bearing thus minimizing friction and insuring smooth running.



The strength of these links makes breaking almost impossible. However, if perchance, one should break, the relacing with a new link is so simple a matter that anyone can do it.

Write for Catalogue

CORBIN SCREW DIVISION

(The American Hardware Corporation)

213 HIGH STREET . . . . . NEW BRITAIN, CONNECTICUT

Distributors: New York, Philadelphia, Chicago

THE Dependable F & S Ball Bearings

BRETZ COMPANY

SOLE IMPORTERS

250 West Fifty-Fourth, New York.





Kelly-Springfield Tire Company
20 Vesey St.
New York

Branch Offices in
New York
Chicago
Philadelphia
Boston
St. Louis
Detroit
Cincinnati
San Francisco
Los Angeles
Cleveland
Baltimore
Seattle
Atlanta
Akron, O.
Buffalo

Kelly-Springfield

Automobile Tires

Specifying Kelly-Springfield when you buy tires, is merely a demand for the highest quality of tire with a greater-than-the-average mileage. It's borne out by the figures and facts.

KELLY-SPRINGFIELD TIRE COMPANY

20 Vesey Street, New York

Branch offices in New York, Chicago, Philadelphia, Boston, St. Louis, Detroit, Cincinnati, San Francisco, Los Angeles, Cleveland, Baltimore, Seattle, Atlanta, Akron, O., Buffalo.

The Hearn Tire & Rubber Co., Cleveland, Ohio
Ideal Rubber Co., Syracuse, N. Y.
Southern Hdwe. & Woodstock Co., Ltd., New Orleans, La.
Bagell Davis Rubber Works, Augusta and Savannah, Ga.
H. B. Olmstead & Son, Syracuse, N. Y.
Hering Tire & Rubber Co., Houston, Texas
Todd Rubber Co., New Haven, Conn.
Atkinson Tire & Supply Co., Jacksonville, Fla.
C. D. Frame & Co., Charleston, S. C.
L. J. Barth, Rochester, N. Y.

IF YOU ARE INTERESTED IN MOTORCYCLES

THE BICYCLING WORLD AND MOTORCYCLE REVIEW
FOUNDED 1877

WILL INTEREST YOU

Published Every Tuesday at 1600 BROADWAY, NEW YORK

$2.00 Per Year **Specimen Copies Gratis**

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Remember these facts about

Prest-O-Lite Exchange Service

When you turn in your empty Prest-O-Lite be sure to get a genuine Prest-O-Lite in exchange. Because Prest-O-Lite Service means more than merely giving you a fresh charge of gas.

In addition to this, ***Prest-O-Lite Service*** includes putting every cylinder that passes through our hands in perfect working order.

In many cases the actual cost of replenishing the solvent, regulating and refinishing the cylinder is more than the small exchange fee.

And on top of this, the owner of a genuine Prest-O-Lite has the privilege of having his empty cylinder, plus a small exchange fee, accepted without question as full payment for what is practically a new Prest-O-Lite, at any of our exchange agencies. When you get an imitation, or a Prest-O-Lite cylinder which some imitator has filled, do you get this service?

The user of genuine Prest-O-Lite pays nothing extra for this service. If you would protect your investment, be sure no one slips on an imitation for your genuine Prest-O-Lite.

Remember that no imitator ever stayed in business long enough to build up a satisfactory exchange service and that no imitator has ever stayed in business long enough to protect the customer's investment.

Mighty few wise dealers trifle with imitations of Prest-O-Lite now.

The Prest-O-Lite Co. 287 East South St. Indianapolis, Indiana

Canadian General Office and Factory, Merritton, Ont.

Branch Offices and Service Stations in all principal cities.
Charging Plants in all parts of the country.
Extensive foreign service.

Exchange Agencies Everywhere

The Largest Automobile Supply House in America

WE WILL EXHIBIT

at the

AUTOMOBILE AND MOTOR BOAT SHOWS

We are now collecting data for our 1913 Annual Catalog, which will contain 256 or more pages and will have a circulation of not less than 100,000 copies throughout the world.

Manufacturers of ACCESSORIES, who are making Parts, Fittings and Sundries for use on Automobiles, Motor Boats, Motorcycles or Aeroplanes, are requested to send us catalogs or circulars and make us a proposition regarding cataloging and handling their material, and, in quoting us, please take into consideration the fact that we have **Fourteen Branch Stores** and quote our prices F. O. B. Each Branch.

Catalog Mailed to Anyone on Request

CHAS. E. MILLER, Home Office **97-99-101-103 Reade St., New York City**

MANUFACTURER, JOBBER, EXPORTER AND IMPORTER

Order from Nearest Branch, Address Chas. E Miller.

NEW YORK CITY—97-103 Reade Street.
NEW YORK CITY—924 Eighth Avenue.
NEW YORK CITY—2782 Broadway.
BROOKLYN, N. Y.—1421 Bedford Avenue.
BUFFALO, N. Y.—624 Main Street.
ALBANY, N. Y.—135 Central Avenue.
CLEVELAND, OHIO—1829 Euclid Avenue.
BOSTON, MASS.—202-204 Columbus Ave.
HARTFORD, CONN.—274 Trumbull Street.
DETROIT, MICH.—227-229 Jefferson Ave.
ATLANTA, GA.—259 Peachtree St.
PHILADELPHIA, PA.—318 North Broad St.
NEW ORLEANS, LA.—601-603 Baronne St.
NEWARK, N. J.—274 Halsey Street.
SPRINGFIELD, MASS.—Bridge and Dwight Sts.

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The Atwater Kent Ignition System



Time was when automobile engineers and the general motoring public thought they must equip their cars with a magneto. Today this idea is fast waning—in fact, it has been discarded by many of the foremost automobile engineers and discriminating motorists who are now demanding a more dependable source of current on their cars.

The increasing use of electric lighting and starting equipment necessitates an ignition system better than the magneto—a system producing a uniformly hot spark at low speeds as well as high—a system giving a hot starting spark with the motor at a standstill—a system that is simple in principle and mechanism as well as in operation, and reasonable in initial and maintenance cost—in brief, a system of ignition that will measure up to the highest requirements of the most modern automobile practice.

Such is the Atwater Kent Ignition System—embodying the best features of both magneto and battery, without the weaknesses of either.

Remember the Atwater Kent System can be easily and quickly installed on any standard make of motor, new or old, without the price of a magneto.

If you have an unsatisfactory magneto, or if your motor is not equipped with a half time shaft, you can use the Atwater Kent System by means of our magneto gear mounting, the cost of which is nominal.

In addition to our standard Type F System, we are marketing a new model —Silent Type K with automatic spark control and insulated primary circuit.



Whether you are interested in motor cars as manufacturer, dealer, owner, or prospective buyer, you should have a copy of our booklet "D." It covers the subject authoritatively and thoroughly and even the most experienced will find it interesting reading.

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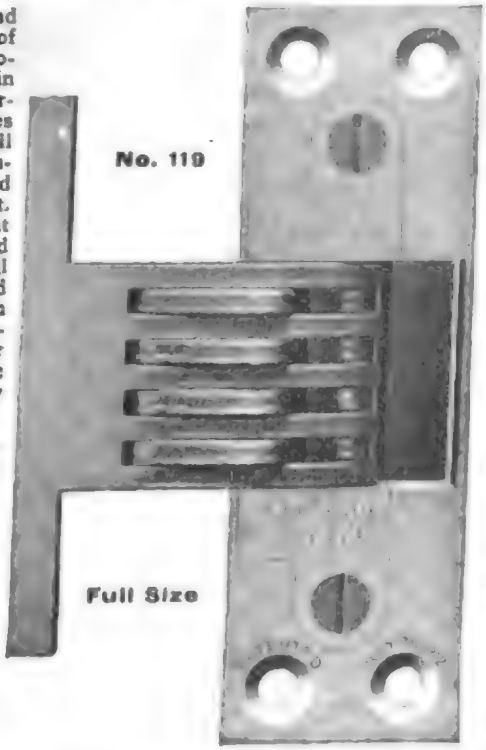
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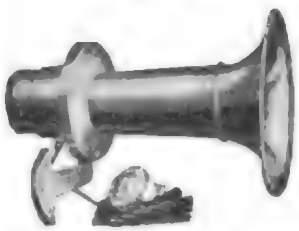
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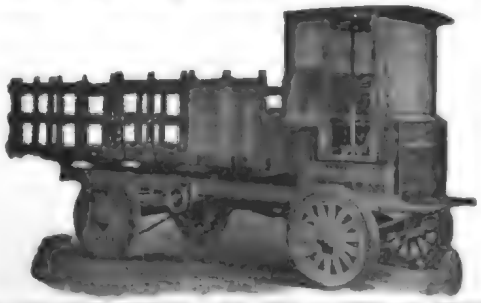
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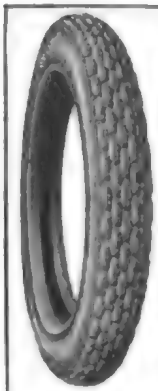
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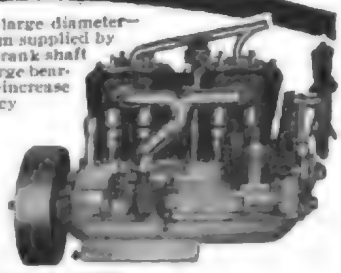
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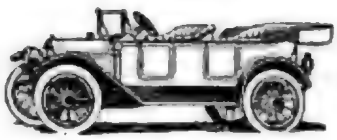
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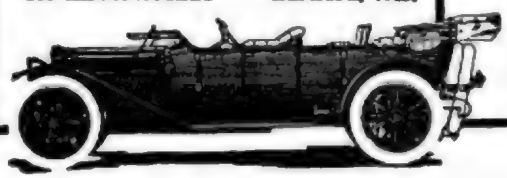
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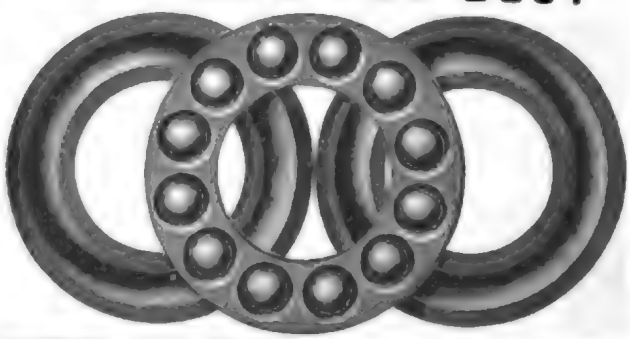
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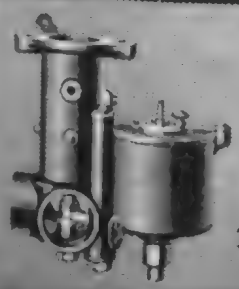
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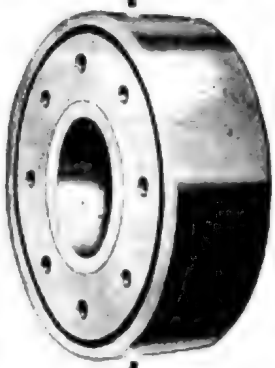
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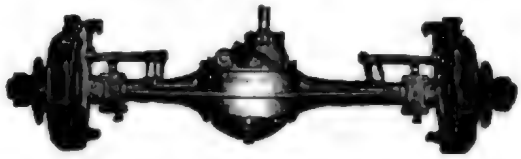
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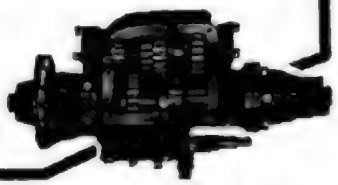
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"The Easiest Riding Car in The World"

The Marmon "32"

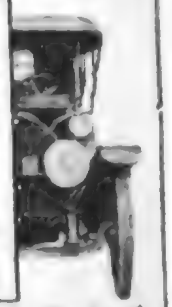
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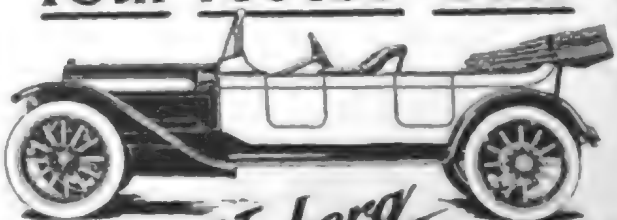
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$1,875	$2,150	$2,750

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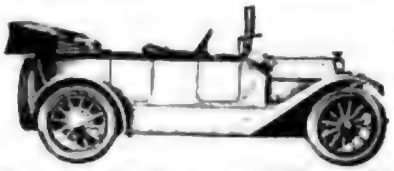
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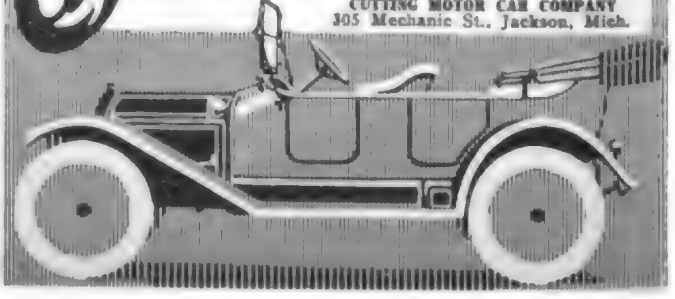
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WRITE TODAY for Cole Blue Book and dealer's proposition.

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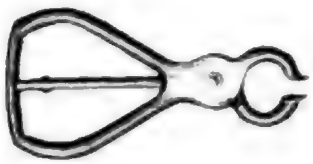
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Mr. Dealer: Look over our "For Sale, Want and Exchange" columns. You will surely find some where among those annoucements a buying opportunity—a straight line to something you want now. Remember that 8,000 other readers are doing the same thing—5,000 of them dealers. All of them intensely interested in the automobile industry. This means a live selling opportunity that costs mighty little.

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36-40	Four-door Roadster, 116-inch wheel base	$1700
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The successful Starter for Fords as well as other makes. Combined Starter and Lighter, $35. Live Dealers given exclusive territory.

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A tire filler 10 to 20 per cent. lighter than any other tire filler. A big proposition for dealers who are on the alert for more and better business. Write for details.

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This name on Automobile Tires and Rubber Accessories signifies inherent qualities of material and workmanship that insure the maximum of service at the minimum of expense. (673)
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Completely equipped, fully guaranteed. 22½ H.P., 4-cylinder water-cooled motor, Bosch magneto. Artillery wheels, best quality 30" x 3" clincher tires. Makes 5 to 50 miles per hour on the high speed. 28 to 32 miles on 1 gal. of gasoline. You can secure EXCLUSIVE SALE in your territory. Send for Book "B."

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The Acme Automatic

Makes Milled Parts in the Time of One Operation.

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A signal of volume, tone and durability. Emits a musical blast of great penetration. Consumes little current. Simple but effective. Retails for $3. Big dealer proposition. Write today.

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For Pleasure Cars and Light Delivery Cars

Send for Booklet 18

The Motz Tire and Rubber Co.
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Service Stations in All Principal Cities

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The Stutz Has a Powerful Motor—

that will pick up on any road or hill at the touch of the throttle. It has attained a record second to none for consistent performance.

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IDEAL MOTOR CAR COMPANY, Indianapolis, Ind.

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All Acknowledge the Necessity of

Weed Chains

In one of those friendly after-luncheon, get-together parties at a well known city club, eleven men drifted on to *the subject of the dangers of skidding.* With a single exception each of the eleven owned an automobile, and each had a *skidding experience* to relate, and each felt that *his particular predicament* was the most sensational and startling.

While nearly all had experimented with the various so-called anti-skid tires, and acknowledged their possible advantages when new—yet when it came right down to "Brass Tacks," there wasn't a single one in the crowd but admitted that *for sure results,* for the **absolute elimination** of every possibility of skidding, **nothing even approximated Weed Chains,** and nothing took their place. Every one of the ten owners carried at least one pair of Weed Chains in his car.

Go where you will, put the question to any assembly of automobile owners you like and the verdict will always be the same—"*We can't get along without them.*"

Weed Chains are universally acknowledged to be the only anti-skid device that can be absolutely relied upon at all times and under all road conditions.

Weed Anti-Skid Chains

Insure perfect control and safe, comfortable driving

Don't foolishly pride yourself on taking chances in order to prove your bravery, or to demonstrate your ability as a driver.

Weed Chains are an absolute necessity on both rear tires and to doubly guard yourself against accidents and to make steering comfortable and easy, put them *on the front wheels too.* They cannot injure tires because "they creep"—occupy very little space when not in use—applied in a moment without the use of a jack or other tool.

Take precaution now When you know the folly, the danger, the peril there is in driving your car over icy, slippery, snow covered roads and pavements, why not fully equip your car today with **Weed Chains** for your own protection and for the safety of other road users.

Recommended and sold by all reputable dealers

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Manufactured in Canada by
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WEED CHAIN
Wisdom Saves
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POLSON
Quality Windshields

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POLSON MANUFACTURING CO., Buffalo, N. Y.

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makes any car start easier in cold weather; adds 10 to 40% to power and mileage. Simple, easily installed, guaranteed effective on any motor. Get details and price.

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forces the water from radiator through cylinder water jacket, maintaining rapid circulation when car is in motion. Write for descriptive matter if you handle Ford cars.

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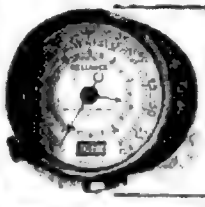
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Highest Efficiency—Good Service Guaranteed

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Final and crowning achievement of R. E. Olds, pioneer designer of Autos. A standard size 30 to 35 horsepower four-cylinder car of modern refinements, priced at only $1,095.

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¶ If every oil was made from Pennsylvania Crude that was said to be made from it, the present supply of that soaring commodity would have to be multiplied by fifty.

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"Puts Noisy Gears to Sleep"

I. O. C. GEAR OIL is the only oil manufactured especially and exclusively for the lubrication of Automobile transmission gears.

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Will begin upon the premises, No. 1192 Niagara Street, regardless of any condition of the weather, on Monday morning, March 17th, 1913, and continue for five if not six consecutive days. There are nearly

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Comprising possibly one of the greatest aggregations ever offered at peremptory sale of modern late type high speed automatic and other machine tools, machinery and mechanical equipment. It is not known that a sale of its character, size, importance and value has ever previously taken place in America. The advance catalogues—in great detail—will be ready for mailing on the 27th instant. All inquiries by mail, telephone, cable or otherwise must be made at the office of the auctioneers.

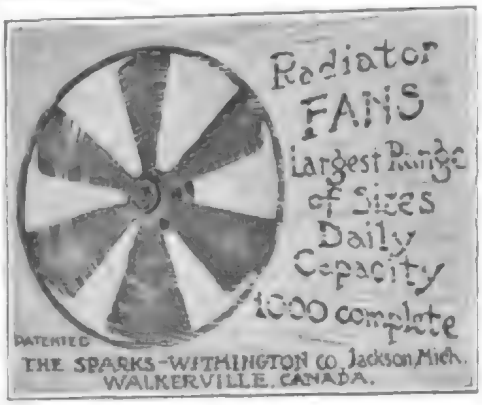
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Mosler Spit Fire Plugs ARE THE BEST
A. R. MOSLER & CO.
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The Only Non-Skid Tires Guaranteed for 5000 Miles
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Special Designs for Every Type of Motor Made
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OF EVERY DESCRIPTION
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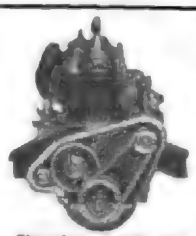


Magneto Plugs coax maximum power out of engine.
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Look at our new middle name
PENNSYLVANIA Oilproof VACUUM CUP TIRES
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SPECIALISTS IN
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Showing simple and efficient chain drive for starting motor. 4 and 6 cylinders 20 to 70 H. P.

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Six Cylinder—Unit Power Plant
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The Continental "Six" is maintaining, on the road at this minute, the good name made by our four cylinder types.

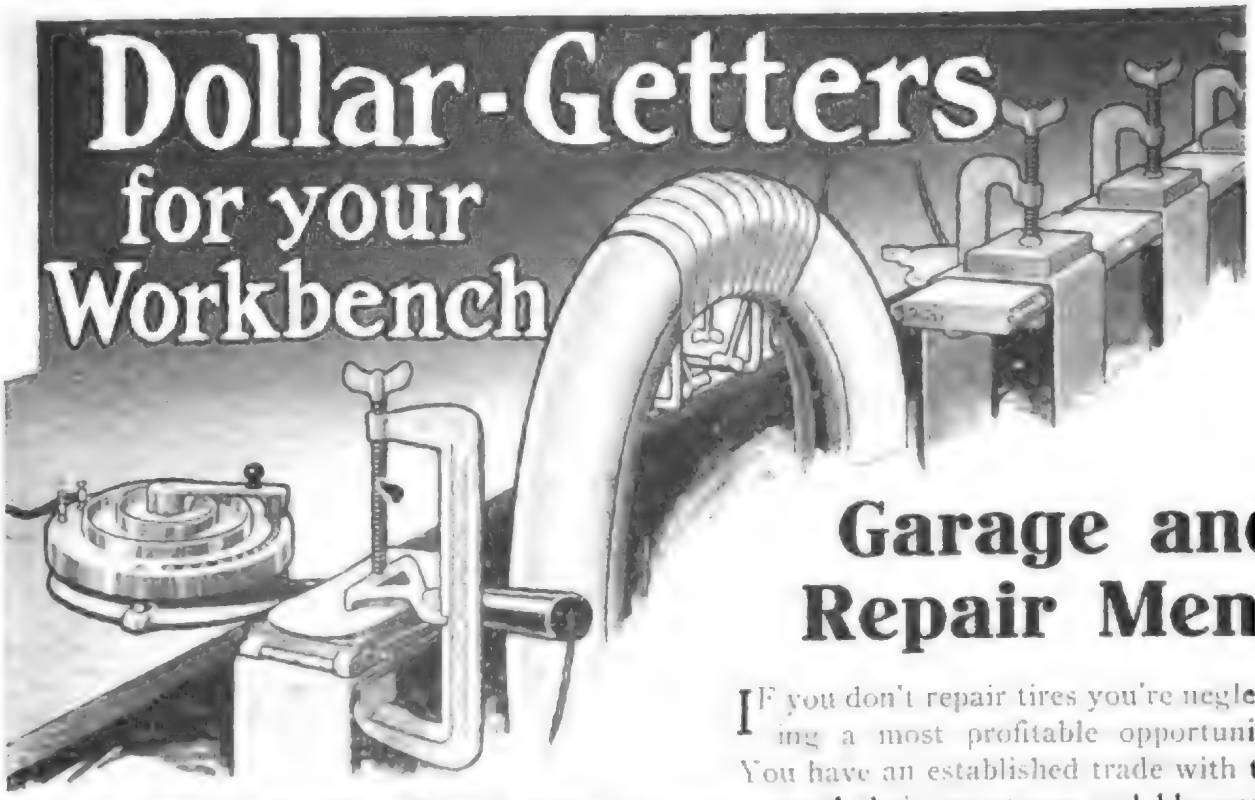
Built to accommodate any type of self-starter now made. Suitable for right or left hand drive.

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Dollar-Getters for your Workbench



Garage and Repair Men:

IF you don't repair tires you're neglecting a most profitable opportunity. You have an established trade with the people who have tire trouble. They'd rather have you mend their punctures and blow-outs than to have you send them to a tire-repairing plant.

A tire repair outfit will pay you big profits. It's a money maker for you as well as a convenience to your customers.

SHALER Vulcanizers

The workbench outfit shown above will handle every practicable kind of tire repairing—tube punctures to casing blow-outs. Each part is independent of the others; that is, you can start with one model of the Shaler line and increase as your work increases.

Heat comes from the most convenient source, electric current. Simply plug into any lighting socket. The vulcanizer heats while you prepare the repair—no smoke—no danger of fire. An automatic temperature control regulates the amount of current, so that the vulcanizer is held at the vulcanizing degree indefinitely. Anybody can make perfect repairs with the Shaler. We furnish instructions that anyone can understand and follow.

We also have a complete line of steam and electric vulcanizers for garages and motorists who do not have access to electric current.

Send the Coupon Today

You'll get a complimentary copy of our famous booklet, "Common Sense About Tire Repairs." Contains a lot of valuable pointers for the wide-awake garage man.

Boston Show, Space F-502

C. A. SHALER CO., 408 4th St., Waupun, Wis.
Send information about steam and electric vulcanizers for a public garage.
Name.....
Address.....

C. A. SHALER COMPANY

408 Fourth Street **Waupun, Wis.**

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For Sale—Wants—Exchange

15 cents per line of six words, cash with order; — In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

POSITION WANTED—Thirty-six years of age, twelve years' experience as mechanical designer, four years as chief with new and successful automobile company, at present engineer for truck company. Experienced with jig tool and automatic machine design. Practical, experienced. Would be profitable to concern requiring the development of new models or concern that requires more profitable mode of manufacture. Available soon. BOX 247, care Motor World

WHY PAY from $5.00 to $15.00 to have the Water Jacket or Radiator of Auto repaired when for $1.00 you can get a large tube of "FIRELESS SOLDER" that will positively do the trick without removing the engine or radiator from the frame. Send $1.00, money order or bill, and a regular $1.50 tube with testimonials will be promptly sent, charges prepaid. WAUSEO CHEMICAL COMPANY, Wauseon, Ohio.

MORA REPAIR PARTS—We have purchased the repair business of the Mora Cars, including all stock on hand, drawings, patterns, jigs, office records and the right to receive the mail of the company. Owners of Mora Cars will save considerable time by placing their orders for parts directly with us. We have in stock repair parts for all models. PHILADELPHIA MACHINE WORKS, 67 Laurel St., Philadelphia, Pa.

KEROSENE FOR AUTOMOBILES—Our new Model B uses successfully half and half mixture lowest grades kerosene and gasoline. Satisfaction guaranteed or money refunded. Greatly increased power, very slow speed on high. Starts easy at zero. Special agents' prices. Dept. N. THE AIR-FRICTION CARBURETOR CO., Dayton, Ohio.

ONE-TON Delivery Truck, in first-class running order; pneumatic tires, two extra shoes, chains, shields, insurance, etc. Having no use for same must be sold at once; no reasonable offer refused. Will give thorough demonstration. LINWOOD HAINES LIMITED, Front and Federal Sts., Camden, N. J.

DETECTIVES WANTED—Young men wanted to operate in own locality, secret service work, experience unnecessary. Enclose stamp for particulars. UNIVERSAL DETECTIVE AGENCY, 304 Colcord Bldg., Oklahoma City, Okla.

WANTED—An expert automobile mechanic, must be thoroughly posted in all lines of the work; prefer a man to take charge of the shop; steady employment and good wages to the right man. MICHIGAN MOTOR CAR SALES CO., Cadillac, Mich.

FOR SALE—Brush car, in good running order, complete, with top, extra tire and full equipment of tools; at a bargain. Address P. JONAS, 780 Delaware Ave., Milwaukee, Wis.

FOR SALE—Stoddard-Dayton taxicab body in good condition. A bargain at $125.00. C. A. BURDETT, Hornell, N. Y.

PLANT FOR SALE CHEAP—Suitable for auto bodies (especially limousine) and accessories. Power, lights, water, dry kilns, sprinklers, sidetracks, abundant storage. A. J. PHILLIPS CO., Fenton, Mich.

LIMOUSINE—$1,200 limousine body, shop worn, for $450. THE MILLER CO., 1026 Connecticut Ave., Washington, D. C.

CYLINDERS reground. Pistons fitted. Prompt shipments. HAUBER AUTOMOBILE WORKS, St. Marys, Pa.

WANTED—To trade seven city lots in Eureka Spgs., Ark., and a 1¼ Kt. diamond for automobile, racing type roadster preferred. Address 308-9 Wysor Bldg., Muncie, Ind.

COMPLETE 5-passenger body, including mohair top, for Stevens-Duryea Model AA car; all in good condition; a bargain for any one who can use it. E. L. ANDERSON, Winton Place, Cincinnati, Ohio.

WANTED—Position as garage superintendent or foreman by technically trained man. Eight years' practical experience. Thoroughly understands carburetion, ignition and self-starting systems. Familiar with modern garage practice. BOX 246, care Motor World.

TO EXCHANGE—Mitchell Model G and lot in thriving town of Ashdown, Ark., for Buick roadster, 1911 or 1912 model, or other make as good. Address LOCK BOX 583, Pittsfield, Ill.

$400 BUYS, COST $1,000

Atterbury truck, 1912, half ton, panel top, hard tires, chain drive; sold because owner bought larger capacity. DUKE, 57 East 108th St., New York.

WELDING—Cylinder crank case and crank shaft welded, cylinders rebored, $7.00 to $11.00 a cylinder, including piston and rings. STERLING ENG. CO., 331-333 S. Clinton St., Chicago, Ill.

WANT Franklin light 5-passenger 1910 or 1911, cheap, for cash; no dealers. 1018 Turner St., Allentown, Pa.

SITUATION WANTED—Professional chauffeur. Handles any gas car and does own repairing. Winton six preferred. Strictly sober. No cigarettes. References furnished. W. H. Greenwood, White Creek, Wis.

SIMPLEX 90, with touring and racing equipment in A1 condition. Cost $7,500. For sale, $2,000. J. A. FORSYTHE, JR., 350 E. Forsythe St., Jacksonville, Fla.

FOR SALE—Garage, equipment and business at Hobart, Okla., county seat of 5,000, two railroads, prosperous and growing agricultural section surrounding. Weather and roads such that everybody uses the auto the year round. No tie up for snow and ice. Come or write. D. A. SCOTT, Hobart, Okla.

FORD Model T Reference Book" gives cause and cure of all the ails of Model T simply and concise. Gives the latest kinks. Full of pointers. Written especially for it. Elaborate cross index enables you to discover any trouble at once. Write for descriptive circular or sent postpaid, $1.00. FORD REFERENCE BOOK CO., 57 West 125th St., New York.

TOPS AND SEAT COVERS.

High-grade material and experienced workmanship in either case. Our Tops are built to look right tomorrow and a year from tomorrow. Our Seat Covers can be cleaned to look like new, with gasoline or soap and water. We're glad to estimate special work or quote prices on stock goods. Prompt service assured. CENTRAL AUTO TOP CO., 120 W. Mich. St., Indianapolis, Ind.

CADILLAC 1911,

$675—5-passenger; top, windshield, slip covers, Prest-O, speedometer, extra shoes and tubes; entirely new; any demonstration. DUKE, 57 East 108th St., New York.

FOR SALE—Cheap, one American Traveler, color battleship gray; just like new; run a little over 4,305 miles. MICHIGAN AUTO CO., 410 7th St., Calumet, Mich.



An ad. like this will cost you 75c. for each insertion.

These columns offer you an opportunity to appeal to an audience of 8,000 readers whose merchandising taste is being cultivated

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15 cents per line of six words, cash with order. — In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

PEERLESS AUTO TOP DRESSING.
A waterproof dressing for leaking mohair and duck tops and curtains. Makes old and faded tops look like new. Ask your garage and supply dealer for it.
The Columbus Varnish Co., Columbus, O.

LOT in Velasco, Texas, for automobile or motor boat; paid $1,000 20 years ago. TOM CHILDRESS, R. F. D. No. 2, Arlington, Texas.

PEERLESS EXTRA FINE BLACK JAPAN.
Covers solid one coat for enameling lamps, radiators and fenders. No undercoat required. Heat does not affect it. Ask your garage and supply dealer.
The Columbus Varnish Co., Columbus, O.

ALUMINUM vulcanizers for both casings and tubes. $3.50 prepaid to any address. Money back if not satisfactory. TRUSCOTT SUPPLY CO., St. Joseph, Mich.

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AUTOMOBILE CYLINDERS reground, new pistons and rings fitted. Garage air compressors. CAST IRON BRAZING CO., Manchester, N. H.

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An oil preparation that softens the leather and pantasote. Makes old tops look like new. Ask your garage and supply dealer for it.
The Columbus Varnish Co., Columbus, O.

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Dyes the cloth linings of tops and curtains a black, uniform color, covering up water stains and grease spots. Does not wash off. Ask your garage and supply dealer.
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Softens the leather and will not crack, wash or rub off. Makes old leather look like new. Dries in twenty minutes. Ask your garage or supply dealer.
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d that wears out your tires.

So we said to our Engi-
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'You must build us a tire
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They did—and they also
ded the No-Pinch Safety
ip for inner tube protection



Then we called in our Chemists and said:

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And the answer is the Diamond VITALIZED RUBBER in

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25,000 Diamond Dealers always at your Service

Diamond Safety (Squegee) Tread for Automobiles, Motorcycles, Bicycles

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It's a self-seller to the man who wants a light but flexible car, capable of every achievement of the larger machines.

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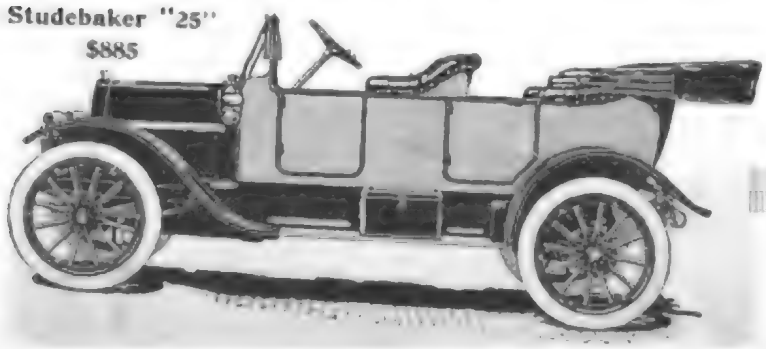
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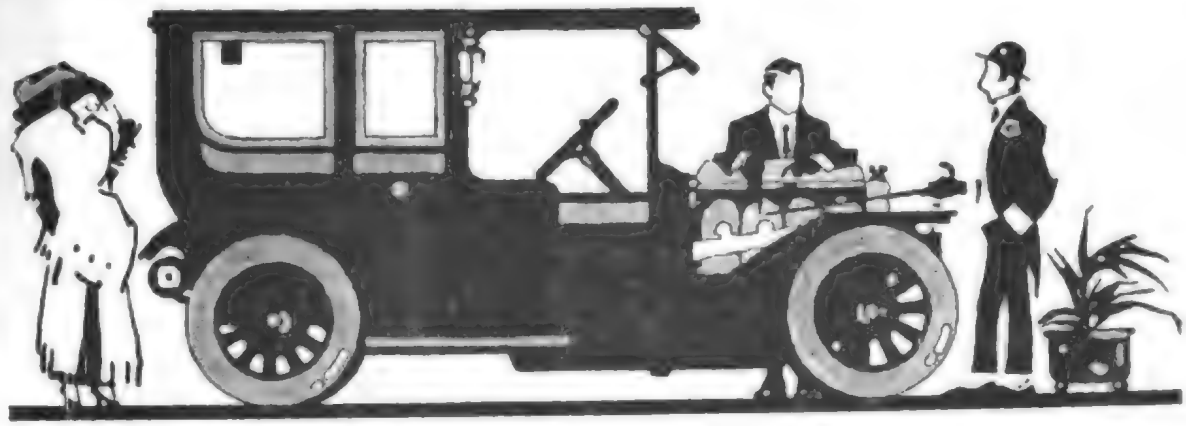
MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXXIV
No. 11

New York, March 6, 1913

Ten cents a copy
Two dollars a year





THE attractiveness of a car to the prospective purchaser depends upon the finish more than upon any other factor.

And upon the **permanence** of the finish—the continued beauty of the car—depends much of the owner's satisfaction.

Because they realize the importance of these two facts, manufacturers of quality cars—no matter what their price—are specifying Berry Brothers' special Automobile Varnishes and Japans. These are the result of 55 years of knowing how—55 years of experience in developing just the right varnish for any given purpose.

It will pay any manufacturer or bodymaker who is interested in securing the maximum of attractiveness at reasonable cost to get in touch with us.

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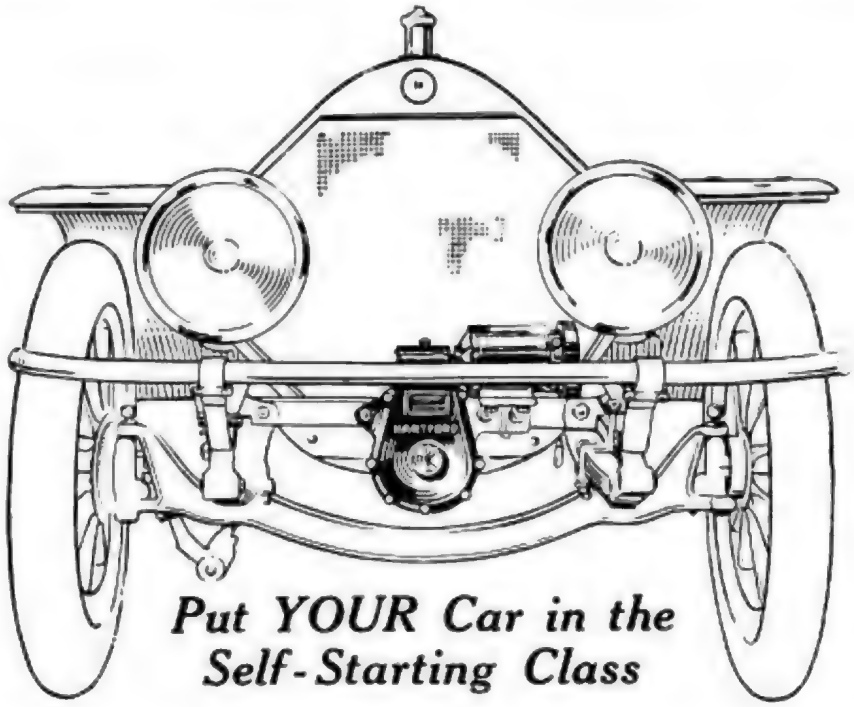
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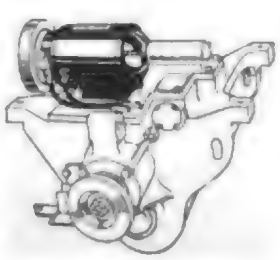
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Fits any car, regardless of make, year or model. It's the most compact and lightest system ever devised; likewise the most efficient and powerful. Only 24 pounds to the weight of the motor that whirls a 90 H.P. engine at 118 revolutions per minute. Low current consumption and the smallest battery equipment of any starter.

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Hartford Starter built into transmission of a new car.

Hartford Suspension Co.

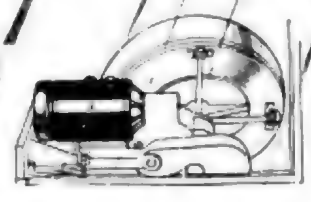
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Manufacturers of

Hartford Self-Starters, Shock Absorbers, Jacks and Bumpers

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Hartford Starter built on flywheel of a new car.

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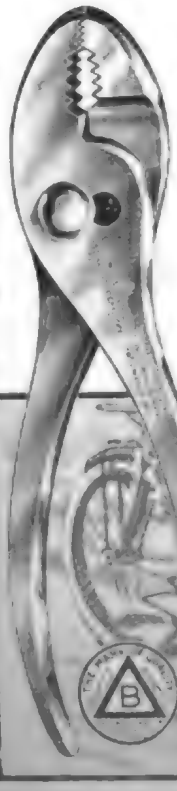


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"The tools that are guaranteed"



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Billings & Spencer Company
Hartford, Conn.

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MONOGRAM OIL

has been continually successful under that one brand name since the very start of the automobile industry. This alone stamps its quality and popular approval.

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If you are a manufacturer—recommend MONOGRAM OIL and the owners of your cars will be pleased and satisfied.

NEW YORK LUBRICATING OIL CO.

Consolidated with

Columbia Lubricants Co. of N. Y.

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Self-Starter
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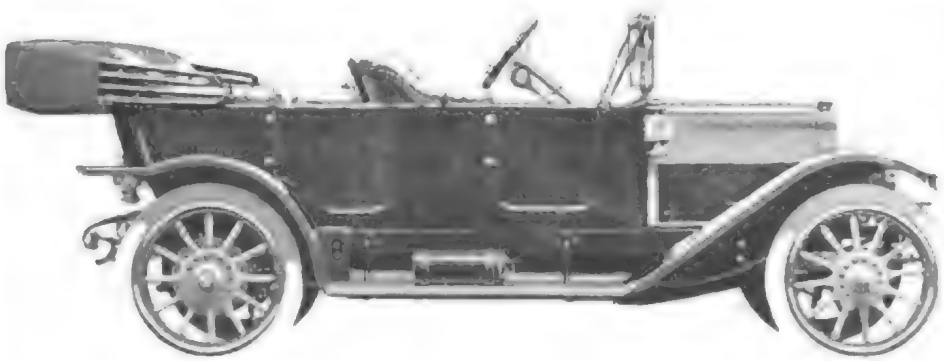
Remy Magneto
Warner Speedometer
Mohair Top and Boot
Clear Vision, Rain Vision
Windshield
Prest-O-Lite Tank

THE 1913 sales of Overland cars are already double those of any other manufacturer producing a similar car. And still we are unable to supply the demand. We have beaten our record for the corresponding months last year by over 300 per cent.

If we can beat all others in sales, surely we can in values. Investigate.

Catalog on request. Please address Dept. 50

The Willys-Overland Co., Toledo, Ohio



MOTOR WORLD

Vol. XXXIV New York, U. S. A., Thursday, March 6, 1913 No. 11

N. A. A. M. TO RETAIN SHOWS IN NEW YORK AND CHICAGO

That Is, the Pleasure Car Sections—Separate Truck Displays May Be Abandoned — Amalgamated Body To Be Incorporated.

Not only the national show in Chicago, the continuance of which already had been assured, but the New York show, will be repeated in 1914—that is, the pleasure car shows. It is exertmely probable, however, that the truck exhibits which form Part II of both the Chicago and the New York functions will be eliminated.

These subjects were discussed at the meeting of the executive committee of the National Association of Automobile Manufacturers at their regular meeting in New York yesterday, point being given to them by the movement undertaken by Albert L. Pope, of the Pope Mfg. Co., looking toward the discontinuance of the two big shows.

Pope himself was present at the meeting and brought with him a formidable array of communications endorsing his views, but the considerations and arguments of the executive committee finally convinced him that if the N. A. A. M., or some other strong trade organization, did not promote the national shows, independent promoters, with only their personal interests to serve, would step into the breach and bring about an undesirable state of affairs. When the force of these arguments bore him down, Pope admitted their weight, and when the vote for the continuance of both the New York and Chicago shows was taken, he made it unanimous.

There is no denying, however, that a strong sentiment exists that a two weeks' show in New York and another in Chicago is entirely "too much of a good thing," and serves sadly to disrupt or disorganize factory operations. In an effort to shorten the season, the N. A. A. M. executive committee placed itself on record as favoring the discontinuance of separate truck exhibits, but before definitely committing itself to their elimination, the opinion of the general membership will be sought.

The amalgamation of the N. A. A. M. with the Automobile Board of Trade was also brought much nearer at yesterday's meeting. The joint committees representing the two bodies were authorized to proceed with the incorporation of the Automobile Chamber of Commerce, as the consolidated organization will be styled, and they will gather later in the month to perform that service. The Chamber will be incorporated under the laws of New York and will retain the present offices of both the N. A. A. M. and Board of Trade, which adjoin each other. Belief that another location would prove desirable was expressed, but it was finally decided to retain the present quarters and remodel them.

Those present at the meeting were: W. E. Metzger, Charles Clifton, L. H. Kittridge, G. W. Bennett, Albert L. Pope, W. C. Leland, Alfred Reeves, S. T. Davis, Jr., W. T. White, R. D. Chapin, H. H. Rice, Alvin Macauley, who acted for S. D. Waldon, and S. A. Miles, general manager.

Lyons-Atlas To Make Cars, Too.

Almost without warning, the Lyons-Atlas Co., of Indianapolis, which several months since acquired the Atlas Engine Works and one of the four Knight American licenses, has decided to build cars as well as engines.

Equally surprising is the announcement that Harry A. Knox, former president and general manager of the Atlas Motor Car Co., of Springeld, Mass., which was thrown into bankruptcy last month, has removed to Indianapolis, where he will assume charge of the manufacture of the Lyons-Knight cars, which will be made in both four and six-cylinder types.

They will be similar to the ones produced by Knox's Springfield company and will be distinguished by worm drive, left hand steer, center control, dash tank and complete electric equipment.

COURT DECLINES TO ORDER $140,000 TIRES DESTROYED

Tells Consolidated Tire It Got Into Wrong Court—Grant Patent Officially "Dead," But Litigation Far From Ended.

Although the Consolidated Rubber Tire Co., which owned the famous Grant patent, No. 554,765, covering the imbedded-wire solid tire, was successful some time ago in its infringement suit against the Diamond Rubber Co. of New York, the court this week refused to grant the Consolidated's request that $140,000 worth of tires made in Akron and Kokomo factories be seized and destroyed on the grounds that they were made prior to the expiration of the patent, which "died" February 18 last. The Consolidated also asked that the Diamond Rubber Co. of Ohio, the Diamond Rubber Co. of West Virginia and the new and greater B. F. Goodrich Co. of New York be brought in as defendants in the suit which now is in the accounting stage, but this, too, was denied.

Judge Coxe, who heard the motions on these points in the United States District Court for the Southern District of New York, declared that the Consolidated company, in its requests for the seizure of tires in other circuits was in the wrong court and that what relief it asked could well be secured in suits of other form and in other circuits, which suits the Consolidated's attorneys state will be brought.

The contention was that the tires were made before the patent died and that their sale after the death of the patent would result in an injury to the Consolidated company; there also enters into the situation the fact that in 1903 the Kokomo Rubber Co., of Kokomo, Ind., succeeded in overturning the Grant patent, and although the United States Supreme Court has since upheld the patent on an appeal from another court, the Kokomo company has

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claimed and has more or less enjoyed immunity from prosecution. The Goodyear company, of Akron, Ohio, was in a like situation.

In commenting upon the requested destruction of the $140,000 worth of tires, the court said:

"The complaint also asks that the marshal of this court be directed to take possession of said stock and destroy the same and that he also be directed to seize and destroy all tires made by the Kokomo company of Indiana prior to February 18, 1913, pursuant to an arrangement with the defendant or the Ohio company.

"The grant patent expired on February 18, 1913, and the invention is now open and free to all the world. The complainant does not point out the modus operandi to be pursued by the marshal of this court in seizing and destroying property situated in Ohio and Indiana, and I venture to think it will have difficulty in doing so.

"Whatever damages the complainant has sustained by reason of the defendant's infringement in this jurisdiction can be recovered upon the accounting. It cannot, however, recover here for the acts of parties in other jurisdictions where the making of the Grant tires was authorized by reason of the decisions of the courts of the Sixth and Seventh circuits that the patent was invalid.

"The petition shows that the complainant has brought action against the Kokomo company which was dismissed. A suit is now pending against the Ohio Diamond company which by an order of the court of the Northern District of Ohio was directed to disclose its transactions in infringing tires. A suit for damages may be brought against any of the parties which the motion seeks to bring in as defendants.

"I cannot resist the conclusion that all the relief to which the complainant is entitled may be obtained either in the present action or in such other actions as it may bring to recover damages against the parties who it insists have infringed the Grant patent.

"The doctrine of Kessler v. Eldred, 206 U. S. 285, cannot be ignored, and so long as it exists it will be lawful to do in one jurisdiction what is unlawful in another. This seriously affects the rights of patentees, but it is the law. The motion is denied."

Rapp to Become Toledo Spark Plug.

The Rapp Mfg. Co., of Toledo, Ohio, maker of Viso and Ohio spark plugs, has taken the necessary legal steps to change its name to the Toledo Spark Plug Mfg. Co. It also has acquired new quarters in the Manufacturers' Building, which will about quadruple its floor space.

BANKRUPTCY BLIGHT FALLS ON GEORGIA'S TIRE PLANT

Fraud and Stock Jobbing Alleged—Treasurer Missing, Apparently With Proceeds of Stock Sales —$200 of Assets Found.

That tire factory in Atlanta, Ga., which was to be the first full blown factory of the sort south of the Ohio River, seems wholly unlikely to throw out blossoms. A legal blight has attacked its roots in the form of a bankruutcy petition and a receiver, of the name F. Roland Alston, has taken charge of the effects of the Inter-State Tire & Rubber Co., as the project had been christened. It was incorporated late last fall, with an authorized capital of $500,000, of which, however, only about $125,000 had been subscribed and not all of which had been paid in. A co-related enterprise, the Inter-State Automobile Association, is also in the hands of Receiver Alston.

The sponsors and officers of both ventures were the same, R. H. Falbaum figuring as president, his wife as vice-president and L. R. Strauss as secretary and treasurer.

According to the bankruptcy petition, Falbaum was a liquor salesman before he engaged in the automobile supply business, first in Birmingham, Ala., where he failed. Removing to Atlanta, the petitioners allege that Falbaum, with his wife and Strauss, "entered into the present conspiracy to promote a fake corporation for the purposes of selling its stock for the benefit of its promoters."

Falbaum and Strauss, it is claimed, set forth that they had secured a factory site in Atlanta and that a building was being equipped with the necessary machinery, but meanwhile, it is charged, they were engaged in selling stock throughout all of the Southern States by "means of various fraudulent advertisements and allegations," the stock salesmen being paid a commission of 20 per cent. It also is alleged that when it was impossible to obtain full cash payment for the stock, small deposits were collected and notes, to suit the convenience of the subscriber, were taken for the balances due.

The attorney for the petitioning creditors states that the receiver found less than $200 in actual assets when he took control. He also declares that the Federal inspectors are on the trail of the company and its officers for violation of the postal regulations, and stamps the Inter-State enterprise as the "deepest saturated in fraud and corruption of any 'blue sky' scheme ever promoted in the South."

Falbaum, the Inter-State president, still is in Atlanta, but Strauss is supposed to have gone to Cuba, taking with him, it is alleged, the greater part of the funds which had been collected from the sale of the company's stock.

Maxwell Creditors Entered Wrong Court.

The Indiana creditors of the Maxwell-Briscoe Motor Co., who somewhat complicated the reorganization of the United States Motor Co., of which the Maxwell-Briscoe company was a part, by filing a petition in bankruptcy against the Maxwell-Briscoe plant in New Castle, Ind., failed to carry their point. The case was heard in the Federal court in Indianapolis last week and was dismissed for want of jurisdiction, the court holding that the action should have been instituted in New York.

When the bankruptcy petition first was filed, the Maxwell-Briscoe Co.—the new name selected by the United States Motor reorganizers—already had taken possession of the New Castle property, but its representative was displaced and the receiver reassumed charge immediately the petition was filed.

Hoover Buys Flanders's Ball Equipment.

J. T. Hoover, who formerly managed the steel ball department of the Flanders Mfg. Co., of Pontiac, Mich., has purchased the machinery and the finished balls and material in progress which were contained in the Flanders plant in Chelsea, Mich. He paid $80,000 for it, $40,000 of which was for the finished and unfinished material. It is stated that he almost immediately re-sold about $30,000 worth of the stock and that the machinery will be removed to Ann Arbor, Mich., where Hoover has organized the Hoover Steel Ball Co. Since the Flanders company went into the hands of a receiver on December 6 last, the appraisers have been at work, but their labors have not yet been completed. It is understood, however, that several parties are dickering for the Pontiac plant.

Goodyear May Build Plant in Brazil.

Although it was stated that the Goodyear Tire & Rubber Co. of South America, which was incorporated late last year, under the laws of Maine, with an authorized capital of $3,000,000, purposed acquiring or developing rubber plantations in Brazil, it now appears that the establishment of a factory in Rio de Janeiro was one of the objects in view.

Representatives of the company have been in Brazil for some time, and it is said that their efforts have met with so much encouragement that the establishment of a rubber factory in Rio de Janeiro "is one of the probabilities of the near future."

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ONE "INTERNATIONAL" IS "INTERNATIONAL" NO MORE

Tire Concern, Offshoot of "League," Becomes Northland and Bidwell Quits Presidency—Former Relationship Off.

For reasons best known to itself, the International Tire & Rubber Co., of Buffalo, N. Y., which was an offshoot of the so-called International Automobile League of that city, has found it desirable to change its name to the Northland Rubber Co.

Incident to the change of name, A. C. Bidwell, head and front of the "league," has retired from the presidency of the Tire & Rubber company, although he still retains at least one share in it.

The new president of the Northland Rubber Co. is Bert L. Jones, who is general manager of the Gorge Route, the scenic trolley line at Niagara Falls. The vice-president is George C. Riley, a Buffalo lawyer, who on occasion has represented the International Automobile League. The secretary and treasurer is W. J. Hayes, a former State bank examiner who at one time was cashier of the Niagara Bank of Buffalo. It is understood that each of the officers hold but one share of Northland stock. Before the name of the corporation was changed, Jones was secretary and Hayes treasurer and general manager.

The Northland Rubber Co. is capitalized at $2,000,000, of which it is stated $1,000,000 has been paid in. When it was being formed under its original name, the "members" of the so-called International league who graciously are permitted to pay $10 per year for the privilege of buying supplies at cut rates, were as graciously allowed to subscribe for stock in the Tire & Rubber company, and it is declared that between 8,000 and 9,000 took advantage of the opportunity. These stockholders will be afforded the privilege of purchasing Northland tires "at a trifle more than cost," and, of course, will participate in any dividends which may be earned.

President Jones was very frank when seen by a Motor World man on Tuesday last and answered all questions without hesitation. He stated that the name of the company was changed because it conflicted with the "league's" title, and also because it simplified matters. He asserted positively, however, that there is no connection between the Northland company and the so-called "league" except to the extent that Northland tires will be sold to the "league," but not at special prices, as it is the purpose of the Northland company to make a bid for the patronage of the trade at large.

The Northland factory has been completed, and it is expected it will begin operations next week. Bidwell, the original promoter and president of the corporation and of the "league," is now in California.

Owners' "Trade Price" Man Disappears.

C. S. Holmes, of Pittsburgh, Pa., who in November last set up in Columbus, Ohio, as the representative of an association which purposed selling supplies to automobile owners at "trade prices," is among the missing. He left behind him a number of unpaid bills and two dishonored drafts which had been endorsed by a clerk whom he employed, and who also mourned the loss of two weeks' salary. James W. Carroll, E. C. Morton and Harry Patton, of Columbus, who vouched for Holmes when he came from Pittsburgh, made good the losses, however, and have taken over the remains of Holmes's business. They probably will reorganize it under the style Ohio Automobile Supply Co.

Portage Claims Note Was Protested.

Alleging that a 30 days note for $4,376.33, given to the Portage Rubber Co., of Akron, Ohio, by the Stein Tire & Rubber Co., which recently withdrew from the trade in New York City, went to protest at maturity, September 22, 1912, the Portage company this week filed suit in the Supreme Court for New York county; the protest fee of $1.30 is added to the face of the note. Because of endorsements, Arthur S. Stein, Ernest J. Willis and the E. J. Willis Co. are named as co-defendants.

Ford Plant to be Immensely Enlarged.

Despite its already enormous production, what the Ford Motor Co. thinks of the future of the automobile business is indicated by the fact that it has accepted plans for the enlargement of its plant in Detroit, which already contains 26 acres of floor space. The contemplated enlargement will consist of three new buildings, each three stories high and 1,700 feet in length.

Syracuse Dealer Freed from Restraint.

Frank P. Anderson, an automobile dealer in Syracuse, N. Y., who was placed on the county limits following the taking of a judgment against him by Mary H. Walsh, has satisfied the claim and is freed from restraint; the judgment was for $1,600 claimed to have been advanced as the price of a car which was not delivered.

Lansden Takes Over Boston Agency.

The Lansden Co., of Newark, N. J., maker of Lansden electric vehicles, has taken over its agency interests in Boston and converted them into a factory branch. The former agent, H. E. Taylor, will be in charge.

OHIO STATE LEGISLATORS ENDEAVOR TO END STRIKE

Senate Committee Investigating Trouble at Akron—Move Causes Workmen to Modify Demands—Manufacturers Remain Firm.

Despite continued desertions from their ranks, the strike of the Akron rubber workers still is in effect. The manufacturers remain firm and, in an effort to investigate conditions leading up to the trouble, and possibly to pave the way to peace, the Ohio legislature has appointed a committee of three senators who have been holding daily sessions in Akron. They have subpoenaed nearly all the prominent Akron tire manufacturers, and a number of the workmen, and their work is still in progress. It appears to have exerted some influence, as on Monday last, the strikers' executive committee drafted a new proposal which is to be submitted to the senate committee and which may lead to arbitration.

In their revised proposal, the strikers have reduced the wage scale at first exploited, the new terms proposing a 25 per cent. increase for all the lower paid workmen, 15 per cent. for tire builders and other highly paid employes and an 8-hour day and the abolishment of piecework.

Pending the settlement of their demands, the strikers have suggested to the senatorial investigators that a board of arbitration, composed of strikers and manufacturers, be appointed in an endeavor to settle the differences. The Ohio State Board of Arbitration previously had not only failed to attain that end but had aroused the resentment of the strikers by reporting to the governor that "the strike is not one of underpaid workers against a greedy, overreaching, cruel industry, as has been portrayed by the I. W. W. and others, but the trouble is due to a state of unrest among rubber workers, occasioned by the report of large and swollen profits realized by the manufacturers."

Fisk Elects Two New Directors.

In accordance with the reorganization plans of the Fisk Rubber Co. when it transferred its charter from Delaware to Massachusetts and increased its capital to $15,000,000, its board of directors has been increased by the addition of R. B. McGraw and E. A. Luddington. The other directors are H. T. Dunn, president, J. C. Cole, vice-president, and H. G. Fisk, treasurer, who constituted the original board. McGraw, one of the new directors, has been chosen to fill the office of secretary of the company.

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CAR EXPORTS IN 1912 GAIN IN EVERY COUNTRY BUT ONE

Revolution-Ridden Mexico Only Division to Fall Below 1911 Figures—Grand Total $30,700,000, a 46 Per Cent. Gain.

While many of the twelve geographic divisions into which the Federal statisticians divide foreign countries showed losses in various months in making up the total of $23,703,989 worth of cars, which, as was told in Motor World of February 13, was exported in the calendar year of 1912, the twelve divisions with but one exception surpassed their 1911 purchases of American automobiles; even the United Kingdom, which lately has decreased its takings, forged ahead by a comfortable figure, and the one loss is easily accounted for when it is stated that the loser is Mexico, which has other things to think of aside from importing motor cars.

The month of December, 1912, as a whole exceeded the same month of 1911 in export figures, although the United Kingdom and British Oceania reduced their purchases in volume and value and France cut its imports by 5, or 14 per cent., in number while increasing by $5,080, or 20 per cent., in value; the greatest gain in number of cars was in connection with South American purchases, which advanced to the extent of 135 cars, or 65 per cent., and the greatest gain per cent. in number was made by Italy, whose increase of 16 cars equals 320 per cent. Canada made the greatest monetary advance, increasing her purchases by $189,314, or 45 per cent.

The total shipments of cars in 1912, as previously stated in Motor World, gained by 7,913, or 50 per cent., in number and $7,779,028, or 48 per cent., in value, and of this gain the greatest portion, in number, was made by Canada, which exceeded its 1911 purchases by 2,433 cars, or 48 per cent., and also led in gain in value with an advance of $3,300,763, or 59 per cent.

In number and percentage gained Canada is followed by South America with 1,085, or 98 per cent.; British Oceania with 909, or 36 per cent.; Asia and Other Oceania with 837, or 103 per cent., and Other Europe with 754, or 95 per cent. Other gains are: United Kingdom, 609, or 15 per cent.; Other Countries, 514, or 184 per cent.; Germany, 335, or 230 per cent.; France, 276, or 65 per cent.; Italy, 112, or 64 per cent.; West Indies and Bermuda, 70, or 23 per cent.

The principal gains in value with the accompanying percentages were: Canada, $3,300,763, 59 per cent.; South America, $1,182,721, 87 per cent.; British Oceania, $874,204, 39 per cent.; Asia and Other Oceania, $844,793, 106 per cent.; Other Europe, $577,019, 80 per cent.; Other Countries, $457,363, 155 per cent.; Germany, $242,299, 192 per cent.; United Kingdom, $138,405, 4 per cent.; France, $81,406, 18 per cent.; Italy, $57,064, 29 per cent., and West Indies and Bermuda, $48,609, 14 per cent. Mexico, the sole loser, fell by 23, or 8 per cent., in number and $31,018, or 6 per cent., in value. The 1912 parts shipments exceeded those of 1911 by $1,350,000, or 41 per cent.

Shipments to the non-contiguous American possessions, Hawaii, Porto Rico, the Philippines and Alaska gained 541, of 54 per cent., in number of cars taken and $573,594, or 30 per cent., in value of cars and parts; gains were recorded in all instances except in the value of cars sent to Porto Rico, where the figure fell by $20,995, or 3 per cent., but the number gained 81, or 24 per cent. The grand total of exports of cars and parts increased in 1912 by $9,703,228, or 46 per cent.

As was previously stated in Motor World 9,029 engines, valued at $1,137,285, were exported in 1912, while for the last half of 1911, which is as far back as these figures are available, the statistics are 1,693 engines, valued at $201,409. December, 1912, gained over that month of 1911 by 407, or 91 per cent., in number, and $45,917, or 84 per cent., in value. The respective figures were, 1911, 447, $54,836, and 1912, 854, $100,753. The values of tires exported in 1911 and 1912 were respectively $2,458,177 and $3,222,133, a gain of $762,956, or 31 per cent. The car figures in detail are shown by the subjoined table.

	December				Twelve Months Ending December					
	1911		1912		1910		1911		1912	
	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.
France	35	$24,043	30	$29,123	235	$704,634	420	$449,757	698	$531,163
Germany	9	5,905	12	18,516	105	303,468	115	124,615	450	366,914
Italy	5	5,202	21	16,335	119	360,785	176	199,986	288	257,050
United Kingdom	858	638,742	269	215,753	1,500	2,495,268	4,031	3,380,266	4,640	3,518,671
Other Europe	90	67,718	110	116,532	460	721,077	795	718,360	1,549	1,295,379
Canada	432	415,246	557	604,560	3,514	3,721,250	4,988	5,552,931	7,421	8,859,694
Mexico	35	57,725	41	86,937	351	645,237	297	490,041	274	459,023
West Indies and Bermuda	37	39,847	54	60,660	244	361,201	300	343,281	370	391,890
South America	207	225,263	342	374,183	422	474,980	1,116	1,356,445	2,201	2,539,166
British Oceania	435	346,046	273	239,961	874	698,736	2,476	2,217,762	3,385	3,091,966
Asia and other Oceania	71	76,493	181	176,011	349	430,460	813	795,576	1,650	1,640,369
Other Countries	33	31,200	123	122,241	270	293,199	280	295,341	794	752,704
Total cars	2,247	$1,933,430	2,013	$2,060,812	8,443	$11,210,295	15,807	$15,924,361	23,720	$23,703,989
Parts (except engines and tires)	.....	302,935	.....	367,364	.....	1,980,001	.....	3,254,123	.....	4,604,129
Total cars and parts	2,247	$2,236,365	2,013	$2,428,176	8,443	$13,190,296	15,807	$19,178,484	23,720	$28,308,118
To American Possessions—										
Hawaii—										
Cars	52	95,051	75	130,208	401	773,737	376	730,089	636	1,024,238
Parts (except engines and tires)	.....	4,926	.....	14,591	.....	57,340	.....	83,298	.....	86,331
Porto Rico—										
Cars	43	68,583	40	44,486	204	394,706	328	583,076	409	362,081
Parts (except engines and tires)	.....	12,888	.....	4,843	.....	96,897	.....	95,590	.....	114,316
Philippines—										
Cars	30	40,671	38	45,277	242	324,821	282	357,460	475	616,761
Parts (except engines and tires)	.....	4,500	.....	1,877	.....	53,666	.....	48,264	.....	53,070
Alaska—										
Cars	1	850	.....	.....	3	4,350	8	6,910	15	19,664
Parts (except engines and tires)	.....	.....	.....	28	.....	2,321	.....	2,214	.....	4,034
Total	126	$222,469	153	$241,310	850	$1,707,838	994	$1,906,901	1,535	$2,480,495
Grand total	2,373	$2,458,834	2,166	$2,699,486	9,293	$14,893,134	16,801	$21,085,385	25,255	$30,788,613

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1912 IMPORTATION OF CARS TENTH LESS THAN IN 1911

Number Shrinks 10 Per Cent. and Total Value Is $1,999,587—France, Only Gainer, Increases Value by 45 Per Cent.

The importation of foreign-built cars into the United States, which does not equal the annual output of a small-sized American factory, decreased during 1912 to the extent of 104 cars and a valuation of $98,893, which is a loss of 10 per cent. in number and 5 per cent. in value, as compared with the calendar year 1911; 1911 also fell below 1910 in number by 52 cars, or 5 per cent., but the value for these two twelvemonths showed an increase of $17,926 for 1911, which is .8 of 1 per cent.

Of all the cars imported in 1912, 56 per cent. were from France, this country sending 469 out of 868 and being the only foreign country or geographic division to show a gain for the year; during the twelve months its shipments to America gained by 128, or 37 per cent., and the increase in value was $352,941, or 45 per cent. All other countries and divisions showed losses ranging from 17 to 60 per cent. in number and from 13 to 56 per cent. in value. The losses in number of cars, per cent., value and per cent., respectively, were: Germany, 97 cars, 60 per cent., $197,379, 56 per cent.; Other Countries, 77 cars, 46 per cent., $169,405, 46 per cent.; United Kingdom, 36 cars, 21 per cent., $55,730, 13 per cent.; Italy, 22 cars, 17 per cent., $29,321, 14 per cent. The parts loss was $61,948, or 18 per cent.

In December, 1912, all countries showed losses except the United Kingdom, the value of whose shipments increased by $700, or 1 per cent., and Other Countries, which enlarged its shipments by 71 per cent. in number and 108 per cent. in value. The statistics for December, 1912, follow, the first being the number of cars for December, 1911, next their value, third the number in December, 1912, and fourth their value:

France, 47, $108,687, 43, $100,589; Germany, 13, $28,086, 7, $19,523; Italy, 13, $21,648, 10, $18,909; United Kingdom, 23, $50,823, 15, $51,523; Other Countries, 7, $17,823, 12, $37,108; total cars, 103, $227,067, 87, $227,652; parts (except tires), $50,325, $12,694; total value of cars and parts, $227,392, $204,346.

The details for the twelvemonth are shown by the subjoined table.

French Exports Exceed Forty Millions.

France, which always has led the rest of the world in the value of automobile exports, piled up during 1912 the prodigious total of $42,396,760, as against $32,343,860 for 1911—an increase of $10,052,900. These figures are all the more impressive for the reason that the gain made in 1911 over 1910 was practically nothing—$258,813.

Great Britain was France's best customer, buying $11,192,910 worth of cars, while Belgium took $10,276,000 worth. Algeria ranks third, though a long way behind, with an importation of French cars of a total value of $3,989,665, and Germany fourth, with $3,280,340. The United States comes only seventh on the list, having spent $943,100 for French cars—must less than Argentina and Brazil, which rank fifth and sixth with $2,601,880 and $2,208,350, respectively.

Germany's Export Gain $6,438,000.

During the year 1912 the automobile export business of Germany made a giant's stride—from $11,475,884 to $17,914,736, a gain of $6,438,852. Curiously enough, Russia bought more German cars than any other country, spending $3,798,006; Austria spent $2,330,258, Brazil $2,306,224, and Great Britain $2,242,674. The United States is far down the list, being nineteenth, the cars bought having a total valuation of only $211,582. The German exports are classified as passenger vehicles, valued at $15,472,618; commercial vehicles, valued at $1,849,022, motorcycles, valued at $593,096.

Remains of Owen Enterprise Disposed of.

The entire stock and equipment of the Owen Motor Car Co., formerly of Detroit, but which was absorbed by the Reo Motor Truck Co., of Lansing, which transaction later led to bitter litigation, has been sold to the M. & M. Co., of Cleveland, Ohio, which makes a specialty of such purchases. The price paid is not public property, but it is stated that the machinery and material acquired is of an approximate value of $300,000.

	1910		1911		1912	
	Number.	Values.	Number.	Values.	Number.	Values.
France	556	$1,066,356	341	$770,643	469	$1,123,584
Germany	129	314,577	160	350,239	63	152,860
Italy	169	312,478	131	203,733	109	174,412
United Kingdom	94	212,969	173	403,506	137	347,776
Other Countries	76	174,175	167	370,360	90	200,955
Total cars	1,024	$2,080,555	972	$2,098,481	868	$1,999,587
Parts (except tires)	....	656,653	...	347,767	...	275,819
Total cars and parts	1,024	$2,737,208	972	$2,446,243	868	$2,275,406

CHALMERS OFFERS MILLION AND HALF PREFERRED STOCK

Cash To Be Used to Supplement Working Capital—Statement Reveals Amazing Growth—Average Profits $1,391,740.

In order to increase its working capital, the Chalmers Motor Co., of Detroit, is offering for public subscription, through Spencer Trask & Co., the New York bankers, $1,500,000 of its $2,000,000 7 per cent. cumulative preferred stock. The common stock of the company amounts to $5,000,000, of which $4,000,000 has been issued.

The offer of the preferred shares serves to disclose the remarkable growth of the Chalmers company. Organized in 1908, with an original investment of $300,000, its present net tangible assets amount to $6,712,216, all of which, excepting the proceeds from the $1,500,000 preferred stock issue, have been acquired out of the surplus earnings. The figures are made even more impressive by the fact that patents, goodwill, etc., are carried at the nominal sum of $1. The net quick assets total $4,743,550, the company's surplus being $1,212,217.

For the four years which ended July 30, 1912, the net profits, after deducting depreciation and interest on borrowed capital, averaged the handsome sum of $1,391,740. For the seven months which ended July 31, 1913, the net profits totalled $827,119 as against $538,457 for the same period of the previous year.

The company is entirely free of mortgages and bonded debt and the floating of the present stock issue will enable it to make a substantial saving in interest on borrowed money.

The stock offered for sale is preferred both as to assets and dividends and is redeemable at the option of the company on any dividend date at 115 and dividend per share. The $500,000 treasury stock remaining in the treasury will not be issued except for cash and unless net earnings applicable to dividends for the 12 months preceding date of such issue shall have been equal to at least three times the amount of the full yearly dividend on the maximum amount of the outstanding preferred stock.

The Chalmers company also binds itself to maintain a net surplus of not less than $250,000 and quick assets having a value at least equal to 275 per cent. of the total par value of the outstanding preferred stock.

Beginning March 1, 1914, and annually thereafter, the company must set aside, out of its net profits and in addition to its dividend requirements, an additional sum of

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$175,000, which will be used for the purpose of retiring the preferred issue. It is estimated that this special reserve fund, as it is styled, will permit the retirement of the $1,500,000 preferred issue within nine years.

The Chalmers balance sheet, after giving effect to the new capital, is as follows:

Assets.		
Cost of plant:		
Including cost of buildings, machinery, tools, equipment, real estate, etc....	$1,836,022.07	
Less Reserve for Depreciation	301,414.43	$1,534,607.64
Good will:		
Patents, trade name, advertising, models, good will, etc.		1.00
Investments:		
Metal Products Co. (axle plant	192,400.00	
Fairview Foundry Co. (brass, bronze and iron foundry)	166,557.09	
Sales branch, etc.	18,085.39	377,042.48
Cash:		
On hand and in banks		196,585.42
Receivables:		
Bills and accounts receivable	574,695.38	
Less reserve against collections	11,188.01	$63,507.37
Merchandise inventory:		
Current inventory for 1913-14 delivery (at cost)	4,345,409.92	
Service department, stock, etc. (at cost)	628,295.63	
	$4,873,705.55	
Less reserve	289,644.69	4,584,060.86
Prepayments:		
Interest, insurance and taxes paid in advance		57,014.95
Total		$7,312,819.72
Liabilities.		
Stock outstanding:		
Preferred	$1,500,000.00	
Common	4,000,000.00	$5,500,000.00
Payables:		
Current materials account (not due)	389,532.54	
Payroll—accrued	43,439.16	
Taxes—accrued	16,137.60	
Royalties—accrued	273.16	449,382.48
Deposits:		
Dealers' deposits on sales contracts		151,220.19
Surplus		1,212,217.05
Total		$7,312,819.72

Stockholder Disturbs St. Louis Company.

Internal warfare in the Halsey Automobile Co., of St. Louis, Mo., has led to the filing of a petition for a receivership by J. D. Perry Lewis, one of the stockholders and vice-president and treasurer of the company. In his complaint, Lewis also names Halsey's wife and several relatives and two directors as defendants.

The charge is that Halsey, or some other officer of the company, has rendered false tax returns to the city, and that with other automobile agents he is engaged in a combination in restrain of trade, in violation of the anti-trust laws in that they have combined to maintain prices on both new and old cars. Lewis further alleges that in five years Halsey has increased his salary from $4,200 to $20,500.

The Halsey Automobile Co. handles the Packard car, but Lewis claims that Halsey has also organized, and is the owner of the Cadillac Automobile Co. of St. Louis, and because of the fact the Halsey company is in danger of losing the Packard agency.

PROMINENT MEN IN TRADE WHO ASSUME NEW DUTIES

Resignations and Promotions That Serve To Place Many Workers In New Places—Few Leave the Industry.

Fred T. Johnson has been appointed manager of the Ford branch in Omaha. Previously he was with the Marion Motor Car Co., of Indianapolis.

C. G. Wilson has been appointed sales manager of the Midland Motor Car Co., of East Moline, Ill. He has had ripe experience in the automobile industry.

E. R. Benson, sales manager for the Studebaker Corporation, has mounted another round on the Studebaker ladder. He has been appointed one of its vice-presidents.

Frederick E. Wilson has been appointed sales manager of the Tone Car Corporation of Indianapolis, Ind. He at one time occupied a similar position with the Henderson Motor Car Co. of that city.

Ernest C. Cox has been appointed manager of the Findeisen & Kropf Mfg. Co.'s Eastern branch, which recently was established at 1902 Broadway, New York City. Previously he was identified with the Texas Oil Co.

O. R. Wolf has been appointed district manager of the Central States for the Henderson Motor Car Co., of Indianapolis. He will make his headquarters in Chicago with the Henderson distributors, Tennant Motor, Ltd.

James Suydam, manager of the Goodyear Tire & Rubber Co.'s branch in St. Paul, has been transferred to the Milwaukee branch, of which he hereafter will be in charge. He succeeds to the vacancy caused by the death of W. W. Wallis.

O. L. Barger has been appointed sales manager of the Hazard Motor Mfg. Co., in Syracuse, N. Y. He has been identified with the engine and transmission trade for the last five years, and until February 1st was connected with the Beaver Mfg. Co. of Milwaukee.

Russ Baldwin, formerly identified with the Jiffy Curtain interests, has been appointed manager of the Stewart-Warner Speedometer Corporation's Detroit branch. Berne Nodall has assumed the duties and title of chief engineer of the Stewart-Warner company.

W. T. Norton, who has been acting as assistant engineer for the Selden Motor Vehicle Co., of Rochester, N. Y., has been promoted to the post of general superintendent. As such, he will have complete charge of the production of both Selden cars and trucks.

Edward Q. Cordner has been appointed manager of the Garford company in Chicago. Cordner previously occupied a similar position with the Garford agency in New York, but originally came from Chicago, where he first was identified with the Studebaker branch.

H. C. Barber, manager of the Krit Motor Car Co.'s New York office, has been transferred to the management of the company's branch in Indianapolis. Before becoming identified with the Krit establishment Barber had had extensive experience with the Herreshoff, Firestone-Columbus and Regal companies.

Earl W. Winans, for the past two years chief engineer for the R-C-H Corporation, of Detroit, has resigned that position to become chief engineer of the Maxwell Motor Co.'s Dayton (Ohio) plant. Before joining the R-C-H staff Winans had extensive experience in the engineering departments of the Columbia and Regal factories.

Harry S. Houpt, one of the best known tradesmen in the East, has resigned the sales management of the American Locomotive Co.'s automobile department, which grew wonderfully under his direction. It has been known that for some time he was not wholly happy, but as his contract did not expire until July 1st it was not expected that he would sooner terminate his relationship with the Alco people. He has not yet shaped his future plans.

Berg and Marshall Settle Differences.

Suit brought by the Berg Auto Trunk & Specialty Co., of New York City, in the New York City Court against Raymond W. Marshall on three different claims resulted this week in a judgment by consent for the Berg company to the amount of $565; $728.65 was asked, the claim being made up of $70.40 for goods sold to Marshall by the Berg company, $9.50 on a check given to a mechanic but which was not honored by the bank and which was turned over to the Berg company, and another check, for $647.50, which Marshall is alleged to have given a repairman and subsequently to have stopped payment upon.

Williams Becomes Castle Lamp's Head.

To fill the vacancy caused by the retirement of Fred Castle, E. A. Williams, Jr., was elected president of the Castle Lamp Co., of Kalamazoo, Mich., at its annual meeting last week. The other officers chosen were: Walter Stewart, vice-president and treasurer, and Royal R. Scott, secretary and chairman of the board. The three officers and Rathbun Fuller and C. B. Mertz constitute the directorate.

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INTERNATIONAL MOTORS EARNINGS IN 1912 $590,149

Annual Statement Shows Orders Nearly Doubled in Quantity and Value —Unfilled Orders of $712,243 at Year's End.

At the end of its first year, December 31, 1912, the International Motor Co., of New York, which controls the manufacture of the Saurer, Mack and Hewitt trucks, figured the net earnings for the twelvemonth, after deducting all expenses and depreciation, at $590,149. Its report, which has just been made public, is as follows:

Interest	$91,101
Surplus	$499,048
Preferred dividend (three dividends	185,260
Balance	$313,788
Special and extraordinary charges	117,151
Surplus	$196,637

The general alance sheet as of December 31, 1912, follows:

Assets.

Real estate, plant, investments, patents, etc.	$7,727,576
Cash	292,458
Notes and accounts receivable	1,470,807
Inventory	2,653,036
Deferred assets	204,022
Total	$12,349,099

Liabilities.

Common stock	$5,628,125
Preferred stock	3,600,000
Bonds	52,000
Mortgages	17,500
Notes payable	2,197,550
Accounts payable	501,511
Accrued accounts	56,547
Advance payments	38,163
Surplus	257,701
Total	$12,349,099

Supplementing the report, President Coleman stated to the stockholders that the International orders show an increase of 95 per cent. in quantity and 96.6 in value, there being on hand at the end of the year unfulfilled orders to the amount of $712,243 in sales value. During January, he added, the company shows sales close to $250,000, an increase of about 100 per cent. He also remarked the passing of the company's 7 per cent. dividend on its preferred shares, and added that it is not the intention to declare the scrip dividends for several months, "as it is not considered good policy to do so at present."

Defeated Once, "35%" Finally Wins.

Although the Personality Liquidating Co., as assignee of the trustee in bankruptcy of the American Pedal Co., defeated the 35% Automobile Supply Co. in December in a suit in the New York City Court over one of the "35%'s" famed advertising contracts, the victory was short-lived, for, having secured an order for a new trial, the "35 percenters" this week triumphed in the litigation, as it has in many others of a similar nature, "beat the case" and filed judgment for $98.23 costs. The Pedal company's claim was that it agreed to exchange $2,800 worth of goods for advertising in a monthly circular gotten out by the 35% company, but it alleged that part of the goods which it supplied were not to be included as payment on the contract; the "35%," however, claimed otherwise and refused to pay $965 which the Pedal company demanded, and this brought on the suit.

Detroiter Secures Site in Tennessee.

The Automobile Manufacturing & Engineering Co., of Detroit, of which R. H. Evans is secretary and treasurer and moving spirit, has acquired a factory site, comprising 108 acres, in Nashville, Tenn., where it expects actively to commence the production of the Evans truck. Evans writes that he has been assured $50,000 working capital and the active participation of prominent Nashville men as directors, and accordingly is proceeding with plans for the construction of a factory, 60 x 200 feet.

Metropolitan Engineers Re-Elect Anglada.

At the monthly meeting of the Metropolitan Section of the Society of Automobile Engineers, held in the society headquarters at 1,784 Broadway, New York City, Joseph A. Anglada was re-elected to serve as chairman for the ensuing year. Herbert Chase and N. B. Pope were elected treasurer and secretary, respectively.

Diebold Forms Another Parts Company.

Charles C. Diebold has retired from the Diebold-Peters Co., of Cleveland, Ohio, which made automobile parts, and, with others, has organized the Diebold Products Co., in the same city. The new company will operate a plant on St. Clair avenue, near 55th street, and will also specialize in automobile parts.

Goodspeed-Detroit Buys Factory Site.

The Goodspeed-Detroit Mfg. Co., which recently was organized to manufacture automobile parts, has purchased a factory site, 100 x 160 feet, in Detroit, on Harper avenue, between St. Antoine and Hastings streets. It is the company's intention to erect immediately a two-story factory.

The Stevens-Duryea Co. has established a branch in Cleveland, Ohio, at Euclid avenue and East 46th street. It is in charge of C. D. Cook, who previously was connected with the Stevens-Duryea factory in Chicopee Falls, Mass.

ELECTRIC RIVALS AGREE ON MERCURY ARC PATENTS

Interchange of Licenses Between Hewitt and General Electric Companies Clears Atmosphere—How Trouble Commenced.

After patent litigation which has extended over several years, during which time numerous interferences had tangled matters into an unusually tight knot, the Westinghouse Electric & Mfg. Co. and the Cooper Hewitt Electric Co. on the one side and the General Electric Co., of Schenectady, N. Y., on the other side, amicably agreed this week, when the troubles of all three companies over a long list of patents owned by the Cooper Hewitt company and a smaller number owned by the General company apparently were settled for all time. By the terms of the agreement, licenses have been exchanged which permit each company to freely operate under the patents of the others.

The litigation just brought to an end was inaugurated soon after April 19, 1910, under which date two patents, Nos. 955,459 and 959,460, covering a mercury arc vapor lamp, were issued to Cooper Hewitt, who forthwith formed the Cooper Hewitt Electric Co. for its exploitation. Subsequently, Hewitt discovered the applicability of the apparatus, which represented an absolutely new discovery in the art, to the rectification of alternating current and its value for such purposes in displacing heavy and cumbersome rotary converters and other apparatus. His own company, however, was concerned chiefly with the illuminating possibilities of the device. Hence, the Cooper Hewitt Electric Co. constituted the Westinghouse Electric & Mfg. Co. sole licensee under these and other patents subsequently issued, to manufacture mercury vapor arc rectifiers for battery charging, etc.

In the meantime, however, the General Electric Co., working along similar lines, had made similar discoveries and attempted to place its own apparatus on the market, the net result being that suits immediately were instituted by the Hewitt company charging infringement of the Cooper Hewitt patents. In the litigation which followed, the Cooper Hewitt company obtained the decision, but in the interim, the General Electric Co. entered counter suits charging infringements of some of its own patents on improvements in the Cooper Hewitt apparatus. Counter suit followed counter suit so fast that in a short time the litigation became difficult to follow, the last echo being a suit instituted by the Hewitt company some six months ago under patent No.

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1,030,262, charging infringement by the General company.

Under the terms of the agreement just reached, the General Electric Co. is licensed under the numerous Hewitt patents, of which Nos. 955,459 and 959,460 are considered to be basic, to manufacture both mercury arc rectifiers and illuminating lamps, while the Hewitt company and the Westinghouse companies, in turn, are licensed by the General company under its own patents to make use of the patented improvements previously charged to be infringed.

Claims Deposit Check Was Protested.

Charging breach of contract in failing to purchase a car for $2,750 and for false representations in the negotiations attending the deal, the Congdon & Carpenter Co., of Boston, Mass., has filed suit in that city against Mr. and Mrs. Raymond S. Joo, Charles E. James and others, all of Brookline, in the same state; the allegation is that the defendants represented that they were stockholders in the Eliot Motor Car Co., which intended to manufacture cars, and James, it is stated, claimed he was president of the Syracuse Portrait Co. A $50 check which was given went to protest and the balance, $2,700, failed to materialize within 30 days, as the complaint alleges was to have been the case.

Reilloc Tyre Makes Demand for Royalties.

Claiming that the Consolidated Rubber Tire Co. manufactured in 1908 under patent No. 826,405, covering a process for building "elastic tires," which process is the property of the Reilloc Tyre Co., Ltd., of England, and that the Consolidated failed to pay royalties as agreed, the Reilloc company, through Henry S. Bunner as assignee, has brought suit in the Supreme Court for New York county for $5,000. The claim is that royalties were to be 5 per cent., with a minimum of $5,000 a year, and that the Consolidated was to have an option on a renewal of the contract; the two $2,500 payments which it is claimed were to have been made July 1 and December 31, 1908, are the sums for which suit is brought.

Maydwell Gets the Mayer Carburetter.

The Maydwell Co., which maintains stores in Los Angeles, San Francisco and Seattle, has been appointed Pacific Coast distributors for the Mayer carburetter. The arrangement calls for the establishment of service stations in connection with all Maydwell stores.

The Empire Tire & Rubber Co., Trenton, N. J., has established a branch in Wichita, Kan., at 127 North Market street. It is in charge of G. H. Fralick.

BUSY SESSION SCHELDULED FOR VISITING ENGINEERS

Program Outlined Provides Unusual Round of Sight-Seeing for British Delegation to S. A. E. Meeting—The Itinerary.

According to the program that has been drawn up, the party of British automobile engineers representing the Institute of Automobile Engineers and the Society of Motor Manufacturers and Traders that will sail across the sea in May to be with the Society of Automobile Engineers at its annual Summer meeting in Detroit, is going to have what in unparliamentary language may be styled a very large time indeed. For, in addition to attending the three-day floating meeting of the S. A. E., which will take the party from Detroit to the locks of the Sault Ste. Marie and back, the British engineers will take advantage of their stop on American shores to visit, among other places, the great steel works in Pittsburgh, the automobile plants in Detroit, and in Indianapolis, where they will stop over long enough to "take in" the forthcoming Sweepstakes race on the Speedway, and allied automobile industries in Cleveland, Buffalo, Providence, New Haven, Bridgeport, and Hartford.

The date of departure from London has been set for May 17th and it has been arranged that the party shall sail on the "Minnewaska," arriving in New York nine days later. Both the 20th and the 27th will be spent in New York—at the Hotel McAlpin—and on the 28th, which is Wednesday, the party will entrain for Pittsburgh, where a stop over will be made Thursday to permit of a visit to one of the famous steel plants.

From Pittsburgh, the route leads to Indianapolis, where the party will arrive in time to witness the Decoration Day contests on the Speedway. On Saturday, May 31st, visits will be made to the factories where American, Cole, Henderson, Marion, National Stutz, and Waverley cars are made.

Leaving Indianapolis Saturday night, the party will invade Detroit, and for the following four days will spend its time in making as much of the rounds of the Cadillac, Chalmers, Ford, Hudson and Packard plants as is possible. The Timken Axle Co., also will open wide its portals for the inspection of visitors, and on the evening of the 3rd of June the S. A. E. will banquet its foreign visitors. On the afternoon of the 4th, the whole party will board the steamer "Detroit III," which has been especially chartered for the occasion, and therefore will not carry any passengers except the members of the three organizations and their invited guests.

On the return trip, Detroit will be reached on Saturday evening, June 7th, when the British party and those of the American party that so incline will immediately embark on another steamer for Cleveland—under the guidance of Secretary Clarkson of the S. A. E. In Cleveland, a two days' stop over Sunday and Monday will be made to permit visits of inspection at the Peerless, Winton and Stearns plants. Thence, the party will leave by night boat, arriving in Buffalo the following morning, where the whole day will be spent in sightseeing, no inconsiderable portion of which will consist of a visit to and an inspection of the Pierce-Arrow properties. Incidentally, Niagara Falls will be "taken in" as a side excursion.

In Buffalo, the party will be split, though it will not officially be at an end. Those whose businesses call them will return to New York and eventually to England by their own routes and the remainder will repair to Providence, where the Brown & Sharpe tool-making plants will be open for inspection. This extension, by the way, is by special invitation of ex-President Alden, who will act as personal guide. From Hartford, which offers a number of tool-making and other industries, and the following day New Haven will be reached, where the doings of the carriage makers will be inspected. In Bridgeport, which will be reached the next day, the works of the Locomobile company will be inspected and thence the party will repair to New York by steamer.

Sue in Big Court for Small Amount.

Commercial Cars, Ltd., of Luton, Eng., maker of Commer trucks, has entered suit in the United States District Court for the Southern District of New York against Chester Griswold on a note which, it is claimed, was given by Griswold August 30, 1912, and which was to have been paid three months later; the amount is $5,883.10. Griswold and the Commer interests in New York City have been more or less closely identified for several years.

Rudd Absorbs Rival Top Manufacturer.

W. H. Rudd, proprietor of the Rudd Auto Top Co., of Detroit, has purchased the business of the National Top & Curtain Co., formerly located at 865 Woodward avenue, in that city, and has consolidated it with the Rudd establishment at 46 Bagg street. The transaction carries with it local retail rights for the manufacture and sale of Jiffy patent curtains in the city of Detroit, which now will be produced in the Rudd factory.

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WHY NOT ACCEPT THE CHALLENGE?

It is well that the New York trade has been thoroughly aroused by the legislative situation in Albany; it will be better if the trade outside of the big city similarly arouses itself, and it will be still better if owners, as well as tradesmen, are awakened to the full meaning of what awaits them if the McClelland bill is enacted into law.

When the New York City trade foregathered last week to discuss the subject, the McClelland measure had not yet been introduced. The minor measures then pending were so repugnant that even a mere show of opposition should have been sufficient to defeat them. But the McClelland bill is a wholly different proposal. It is in the nature of wholesale amendment of the existing law and, having the backing of both the governor and the secretary of state, it at once over-shadows all else.

For a governor who so loudly and so frequently proclaimed his sense of justice, and for a secretary of state who professed to be so fair that he called the automobile interests into conference, the McClelland bill is a magnificent example of the emptiness of political declarations. It is a hodgepodge as pernicious as it is far-reaching. It lacks the first elements of justice. The only redeeming feature in it is the proposed reduction of the chauffeur's fee, which, as a matter of fact, has no place in any law, for there is even less equity in requiring any man to pay a fee for the privilege of engaging in legitimate employment than there is in exacting a fee for the right to use the public highways.

The manner in which the McClelland bill imposes additional fees and restrictions on users of motor vehicles betrays lack of both senses of justice and proportion. It was never better illuminated than by the manner in which the governor of the state would pile on the fees and restrictions on even commercial vehicles. Certainly they are not luxuries and as certainly they are not swift-movers. The increased tax on commercial vehicles, or any tax at all, bears further witness to the hollowness of legislators' professions and vividly illustrates the too general notion that owners of motor vehicles are fit only to be "plucked."

The fashion in which the McClelland bill, if enacted, will complicate the non-resident and reciprocal situation, and the manner in which it sets up the secretary of state as a czar, with power to revoke human rights at will and without a hearing, are unworthy of such a man as Governor Sulzer, or anyone else, claiming to be fair-minded.

The proposed McClelland bill may not pass, but whether or no, it points anew to the only effective weapon within the reach of motorists, the one means which Motor World has urged almost from the day the first automobile law was introduced—the ballot. If they understand nothing else, politicians and so-called statesmen alike understand the language of votes, and the automobile interests of the State of New York are of such magnitude that they undoubtedly could handsomely defeat not a few law-makers and thus teach all of them a lesson.

It may be regrettable that the right to free and fair use of the common highways should be made a political issue at the polls, but the McClelland bill and the other bills in Albany, and in the legislatures of other states, are in the nature of an oft-repeated challenge which automobile owners and tradesmen no longer should refuse to accept.

HORSEPOWER TAXATION HERE AND ABROAD.

In a possibly laudable attempt to emphasize the "liberality" of the existing American method of taxing horsepower, the New York Times cites the taxes imposed in Great Britain and other countries as examples of "something to kick about." But if the Times is aware that as a rule the bore of British and French engines is abnormally small and the stroke abnormally long it gives no evidence of such knowledge.

Small bores are used for the specific purpose of obtaining the minimum taxable "horsepower," but that the "horsepower" is not always what is indicated by the tax is revealed by the practice of at least one manufacturer who rates his engines "6-30 horsepower," the "6" representing the taxable "horsepower" according to the British formula, and the "30" representing the actual horsepower developed. Which goes to prove the illogic of taxation based on bore alone.

The bore of the moderate-powered British four cylinder engine probably will average three inches; the bore of the average American "four" in the same class probably is 4¼ inches. In England, the "three inch" car would be rated at 14 horsepower and would be taxed $21, while the 4¼-inch American engine would pay for 29 horsepower and be taxed $41. In New York State, for instance, the English motor would be taxed $5 and the American $10, the formula in vogue being the same in both countries.

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DEALERS UP IN ARMS OVER PROPOSED NEW YORK LAWS

Condemn Oppressive Legislation Now Pending and Set to Work to Cause Its Defeat—Obnoxious Measures Outlined.

Unless at least some—the more the better—of the obnoxious bills introduced at Albany are quashed before they become the particular pride of their sponsors by enactment into law, it is altogether likely that the price of "gas" and the development of kerosene carburetters will cease to interest the individual motorist longer, for few will be able to own cars and those that are able will not care to operate them under the stringent restrictions it is proposed to adopt. At least, such is the opinion, in concrete language, of the members of the Automobile Dealers' Association of New York City, in conclave met last week to discuss such matters and to endeavor to formulate a plan to prevent the passage of the 25-odd measures now pending and which scarcely can be viewed in any other light than that of class legislation.

Charles Thaddeus Terry, who is counsel for the association, and who always has been active in the fight against unjust legislation, addressed the meeting in his usual forceful manner, and in pointing out the iniquity of the proposed laws, called attention to the seeming belief of the legislators that all motorists are criminals and must be treated accordingly.

The legislative committee of the association, consisting of Arthur M. Day, of the A. Elliot Ranney Co.; R. H. Johnston, of the White Co., and Wm. C. Poertner, of the Poertner Motor Car Co., has commenced to enlist the efforts of both users and manufacturers to kill the bills before it is too late. A hearing on the bills has been set for March 13 in Albany, when a special train will be chartered to carry the dealers' representatives. In the mean time, letters will be addressed to manufacturers and private owners pointing out the injustice of the measures and urging a united fight against them. Latterly, the Motor Truck Club has allied itself with the Dealers' Association in the fight and in a long letter to its members making plain the evils of the measures urges action, the most preferable form being intercession with their own Assemblyman or Senator.

Dyers to Aid in Gasolene Campaign.

That the automobile trade is not the only one hard hit by the rise in the price of gasolene developed this week, when representatives of the Dyers' & Cleaners' Association of New York City conferred with officers of the New York Garage Association with the object of effecting a union of the two forces in the fight for an amelioration of conditions as regards the price of this petroleum product.

The conference resulted in the issuance of a call for a meeting this evening, 6th inst., in Maennerchor Hall, 205 East 56th street, New York City, when representatives of the two trades will discuss the situation. How the garage trade has been affected is well known and the straits of the dyers and cleaners are as bad, for while gasolene has mounted steadily in price these tradesmen have not been able to boost the price of their work and losses are said to result in many instances. One dyer states that he uses 1,500 gallons of gasolene a week.

White Changes to Another Court.

When the Appellate Term of the Supreme Court for New York county ruled last month that a verdict of $4,422.70 which The White Co., of Cleveland, Ohio, secured in the New York City Court against the White Motor Car Co., its former Brooklyn dealer, must be cut to $2,000 or the case retired, the White Co. apparently was displeased with the ruling, for the same case has been filed in the Supreme Court for New York county, the complainant, however, being Theodore F. Conrad, an assignee of the White Co.

The case was tried in City Court and the reduction was ordered by the Appellate Term of the Supreme Court on the grounds that the City Court acted beyond its jurisdiction in hearing cases where more than $2,000 was involved; the claim is based on a note given by the Brooklyn dealer and endorsed by Saitta. In the refiled case the White Motor Car Co. enters a counterclaim of $22,363.50 for profits on cars which it claims the White Co. unlawfully sold in the Brooklyn territory and also for $270 which it claims was due it on a collection of $4,730 made by the White Co.

Retrial of Caffe's Suit is Ordered.

Michael P. Caffe, who is suing the now bankrupt Newark Automobile Mfg. Co., of Newark, N. J., for commissions on a stock selling deal, will have doubly earned the $5,775 which he asks if ever he succeeds in getting it, for, the case having once gone against him and the company having gone into bankruptcy since he was granted a new trial, it was only this week finally decided that the trial may go on. The second trial was under way when the filing of a petition in bankruptcy, Aug. 31, 1912, served as a stay of proceedings. Caffe is the assignee of L. R. Bonta and Charles Hallock, who claim they contracted to sell stock of the Newark company and that before the term of their agreement expired the company sold $49,500 worth of its own accord and thereby deprived the commission men of rightful earnings to the extent of $5,775.



March 3-8, Pittsburgh, Pa.—Pittsburgh Automobile Dealers' Association's show in Duquesne Garden.

March 3-8, Bridgeport, Conn.—Bridgeport Automobile Dealers' Association's annual show.

March 3-8, Sioux City, Ia.—Sioux City Automobile Dealers' Association's annual show.

March 3-15, Des Moines, Ia.—Des Moines Automobile Dealers' Association's fourth annual show in the Coliseum. First week pleasure cars; second week trucks.

March 5-8, Tiffin, Ohio—Tiffin Automobile Dealers' Association's third annual automobile show.

March 8-15, Boston, Mass.—Boston Automobile Dealers' Association's annual show in Mechanics' Hall. Pleasure cars only.

March 10-15, Dallas, Tex.—Annual show of the Dallas Automobile Dealers' Association in the Fair Grounds Coliseum

March 12-15, Peoria, Ill.—Peoria Automobile Dealers' Association's annual show in the Coliseum.

March 17-22, Norfolk, Va.—Norfolk Automobile Trade Association's second annual show in the State Armory.

March 19-22, Springfield, Ill.—Springfield Commercial Association's show in the Armory.

March 19-25, Boston, Mass.—Boston Commercial Vehicle Association's annual show in Mechanics' Hall.

March 24-29, Indianapolis, Ind.—Indianapolis Automobile Trade Association's show.

March 24-29, Watertown, N. Y.—Annual show of the Watertown Automobile Dealers' Association in the State Armory.

March 29-April 5, St. John, N. B.—New Brunswick Automobile Trade Association's show in Queen's Rink.

April 1-6, San Francisco, Cal.—San Francisco Automobile Dealers' Association's motor truck show.

May 5-8, Washington, D. C.—Motor truck reliability contest under the auspices of the Washington Post.

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MCCLELLAND BILL, BACKED BY STATE OFFICIALS, MENACES NEW YORK'S AUTOMOBILE INTERESTS

Would Double Registration Fees and Compel Owners To Be Licensed and to Wear Chauffeurs' Badges—Also Seeks to Require Them to Vouch for Drivers—Trade Tags Restricted and Reciprocity Complicated by Non-Resident Definition—Oppressive Fines.

Of the several bills pending in the New York legislature which will be attacked by the automobile interests at the public hearing in Albany on Thursday next, 13th inst., undoubtedly the one which must be taken most seriously was introduced in the Senate late last week by Senator McClelland.

It was reported to have been introduced in the assembly by Majority Leader Levy, but, on Tuesday last, Levy positively denied to a Motor World representative that he had done anything of the sort. On the contrary, he stated that he had refused to stand sponsor for the measure. It is understood, however, that Assemblyman McGrath has no scruples on the subject and will carry the burden on his shoulders in the lower house, into which he will introduce the bill some time during the present week.

Proposed Measure Is All-Superceding.

The McClelland measure is the most threatening of the several bills, as it embodies the ideas of both Governor Sulzer and Secretary of State May, and, if passed, it undoubtedly will supercede all of the minor measures which are on the legislative calendar. It is in the nature of a sweeping amendment of the present law, which it fairly cuts to ribbons and in a manner so drastic as to be astounding.

The act not only proposes a heavy increase in registration fees on both cars and trucks, but requires that owners, like chauffeurs, shall be licensed, and immensely enlarges the powers of the secretary of state. It not only authorizes him to suspend or revoke licenses at his pleasure and without hearing, but even permits him to refuse to register a vehicle if the application therefor shall not have been received prior to December 15th, the McClelland measure making the registration year begin January 1st instead of February 1st, as at present.

Fees Which the Bill Would Fix.

If enacted, the new registration fees will be as follows: For motor vehicles of 25 horsepower or less, $10 instead of $5; between 25 and 35 horsepower, $20 instead of $10; between 35 and 50 horsepower, $35 instead of $15; more than 50 horsepower, $50 instead of $25. The registration fee of commercial vehicles will be $5 for each ton, or fractional part thereof, up to and including six tons, and if above six tons $10 for each ton or fractional part thereof, of the carrying capacity of such motor vehicle as determined by the secretary of state. Cars or trucks registered after July 1st will pay one-half of the annual fees. Motorcycles, which at present are exempt, will be taxed $3 per year.

If it becomes a law, the McClelland bill will put an end to the use of trade cars for pleasure purposes by tradesmen. It provides that dealers' numbers "shall not be used for any other purpose than testing or demonstrating the vehicles to a prospective purchaser, or removing such vehicles from place to place for purposes of sale."

Doors Open to All Foreign Tourists.

Interstate touring privileges will be broadened, the amendment eliminating that section requiring that privileges shall be extended only to residents of states granting similar reciprocity to New Yorkers. The definition of non-resident, however, is made much more stringent, as follows: "'Non-resident' within the meaning of this article shall apply to residents of States or countries who have no regular place of abode or business in this State for a period of not more than thirty days in the calendar year."

This requirement would seem to deny non-resident privileges to the very many men who reside in New Jersey but who maintain offices or other commercial establishments in New York City and who cross the border daily.

Chauffeurs and Owners In Same Class.

According to the McClelland idea, owners will be licensed and "tagged" exactly as are professional chauffeurs. The license fee, however, will be reduced from $5 to $2 and the renewal fee from $2 to 50 cents. The owner, like the chauffeur, must display a badge and while any member of his family over 18 years of age may drive the family car, he also must not only obtain a license and badge but the owner of the car must stipulate that such member of the family is "constituted his duly authorized agent." The remarkable provisions of this remarkable amendment are as follows:

"License of owners and members of owner's family.—Every owner of a motor vehicle registered under the provisions of this article who desires to operate such vehicle upon the public highways of this State, and every member of the owner's immediate family who desires to so operate, shall make application, by mail or otherwise, to the secretary of state, for a license to operate such vehicle. Before such license shall be granted, the applicant shall pass such examination as to his qualifications as the secretary of state shall require, and if the secretary of state determines that the applicant is a proper person under the provisions of this article, such license shall forthwith be granted to such person without expense.

"Owners' licensed registration book.—Upon the receipt of such an application, the secretary of state shall thereupon file the same in his office and register the applicant in a book or index which shall be kept in the same manner as the book or index for the registration of motor vehicles or the licensing of chauffeurs, and when the license shall have been issued, the number or mark assigned to such applicant shall be noted in said book or index.

"Unauthorized possession or use of license or badge.—No chauffeur or owner or member of such owner's immediate family having been licensed as herein provided shall voluntarily permit any other person to possess or use his license or badge, nor shall any person while operating or driving a motor vehicle use or possess any license

(Continued on page 30.)

New Jersey Wants Conference of States.

In an effort to bring order out of the chaos created by the flood of automobile bills which are pending in the New Jersey legislature, as well as in the legislatures of so many other states, the New Jersey authorities will endeavor to bring about a conference of interested State officials with a view of shaping legislation along similar lines.

The movement took form in the adoption of a joint resolution by the house and senate "authorizing the Governor to appoint three commissioners to act with commissioners to be appointed by other States to see if they can agree upon laws regulating the use of motor vehicles and the registration of same."

This resolution was signed by Governor Wilson on Thursday last in the last few hours of his occupancy of the chief executive's chair in New Jersey prior to his advance into the White House at Washington.

It is not the first time that such a movement has been undertaken, and the outcome of the present effort is likely to be as fruitless as the previous endeavors to the same end.

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WIDE-AWAKE MERCHANDISING In the MOTOR TRADE

EXAMINING BUSINESS METHODS

Investigation by Proprietor in His Own Establishment Often Proves Profitable—Lines of Search and Objects in View.

Once in a while it is a good thing for the automobile dealer to draw away from the pressing activities of business and ask himself some searching questions in regard to his business.

Mentally he should go over everything that can be classed as "Inside Service." Is the line of cars you are selling right? That is, is it right for your locality? Is it the line on which you can build a big future? Is your help efficient? Do your employes carry out the spirit of courtesy and willingness you know to be essential to success? Are you giving prompt service to customers? Is some one always near the door to receive callers? Does neatness and cleanliness prevail in your salesroom? Are the windows clean? Do you change display frequently? Are you getting all you can out of your window display space? Does your place of business look attractive from the outside? Is it the sort of place a transient would select as being up-to-date? How can you improve it?

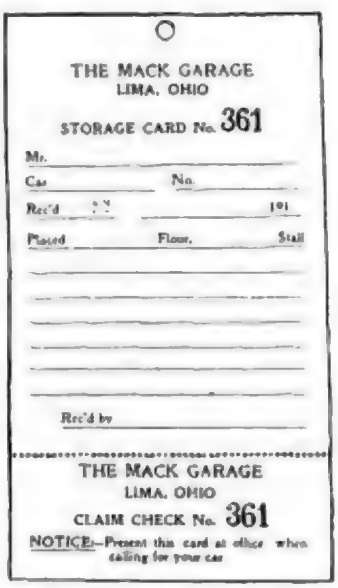
Scrutinizing "Outside Service."

Then under the heading, "Outside Service," consider all those things that reflect you to the public. Is your demonstrator right up to the mark? What plan of work are your salesmen following? Are they applying systematic effort on prospects? What are you backing up salesmen with? Have you a carefully planned advertising campaign? Are you cultivating a larger field of prospects than you should cultivate, or is your list altogether too small? If you were a customer, what would you have your garage do differently? And so on.

Just as self-examination can be made a definite and positive help to character building, so an occasional rigid examination of business methods, policies and conditions cannot but prove profitable.

STORING TRANSIENT CARS BY AN EFFICIENT CARD SYSTEM.

Hyslop Brothers, who operate a high-grade garage in Toronto, Ont., are not the only garagemen who have devised a "check" system whereby a car which is left in storage may be instantly located when the owner calls for it, for S. R. Buchanan, manager of the Mack Garage, 124-26 Market street, Lima, Ohio, writes that his establishment has used a storage check for some time with excellent results. Buchanan states that the little card, of which an illustration appears herewith, never fails to permit the picking out of a car the next day or the next week after it was left by the owner.


THE MACK GARAGE
LIMA, OHIO
STORAGE CARD No. 361
Mr.
Car No.
Rec'd 19
Placed Floor Stall
Rec'd by
THE MACK GARAGE
LIMA, OHIO
CLAIM CHECK No. 361
NOTICE—Present this card at office when calling for your car

MACK CHECK AND STUB

The card is in three parts, two of which are shown; the third is a paper duplicate of the upper half of that illustrated. When a car is received the upper half and the paper slip are filled out with the owner's name, name or number of car, date and time received, floor and stall number and man receiving; the paper sheet is filed in the office, the upper half of the tag is attached to the car, and the stub below the perforations is given to the owner. All three bear the same serial number, and when the owner presents his stub a look in the office file reveals the location of the vehicle and a comparison of the office slip and the slip on the car permits no error.

DON LEE'S SERVICE SYSTEM THAT KEEPS THE SKIES CLEAR.

Don Lee, who sells a thousand Cadillac cars a year in California and has headquarters at Los Angeles, has built up a reputation for service that draws him business from every corner of his territory.

One feature of this service is a corps of men who do nothing but call on Cadillac owners. Every Cadillac owner is sure of being in touch with Don Lee either directly or through a representative at least once a month. It makes no difference when you bought your Cadillac; if you are a Cadillac owner, you are called on once a month by a pleasant voiced, intelligent, gentlemanly man who wants to hear your troubles.

"Quiet Kickers" Source of Worry.

Where there are so many customers some are sure to be disgruntled; but it is not the ones who come to the garage and kick that worry the dealer, but those who get sore over some unavoidable incident perhaps, and stay away, giving the dealer no chance to square the situation. This plan of systematic calling once in thirty days keeps the skies clear at all times, because it keeps the firm in close touch with every user. The result of the plan is an army of boosters who root for the Cadillac and will not be persuaded to buy from anybody but Don Lee or his representatives.

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AWAKE-NDISING WORLD

SUPPLYING THE OWNER'S NEEDS

Wide Field for Dealer in Filling Small Wants of Man Who Runs a Car—Acquaintanceship with Owners Basis of Sales.

"Sell as many things as possible to the automobile owner; don't sell him unnecessary things; but of the things he must have, sell him as many as possible." This is the message of the Merchandising Spirit to the automobile dealer. The dealer who heeds it finds an era of profits that makes him wonder why he did not get busy sooner.

The really great accomplishments of business are always built upon the simplest ideas. Henry Ford has built the largest automobile business in the world upon a simple idea. The idea was to build a car for the masses instead of for the classes. That was where Ford differed fundamentally from almost every other manufacturer. He got his idea and stuck to it. And this year Ford probably will build 150,000 cars.

Cutting Overhead with Accessories.

The automobile dealer who desires to become a merchant will see in the Spirit's "message" a concrete suggestion that leads to a world of opportunities. It is a simple, practical suggestion—so simple, and so seemingly ordinary, that 99 dealers out of a hundred who read it will probably continue just as they have been doing, trying to spread overhead expense against automobile sales only, instead of thinning down the overhead by means of selling to every automobile customer every blessed thing he is likely to need.

Enter the Venture Whole-heartedly.

The hundredth man will do as the hundredth man usually does: think it over till he gets a full view of the money-making possibilities in the suggestion and then decide to test it out as quickly as possible. And the hundredth man will not try to settle such a big and important move by a stingy lay-out in a few bottles of cement and a few tire patches which are just what every one else has; he will go into the business of selling the automobile owner as many of the things he needs by having a stock that is really representative of the varied requirements of the motorist. Nor will he rest his energies on the fact that he has purchased and installed a stock of tires, supplies and accessories; he will use the newspapers and the mails to let every automobile owner in the vicinity know that he is prepared to take care of them on every count. As a result of this procedure he will have the chance to take care of them on many counts, and thus will draw to his garage or store many car owners who will later become car customers of his.

What May Be Gained by Knowing Men.

Business follows acquaintance if the acquaintance is of the business-building, confidence-creating sort, and the dealer who is continually bringing new customers to his store or garage and building confidence by giving service and full value for the money has a touch that is just as marvellous in profit-bringing as the lamp of Aladdin or the golden touch of King Midas.

"DEAD" FIRES THAT SUGGEST FORGETFUL SALESMEN.

Forget the fire and out it goes, though cheerful and full of heat it was but a short while ago. It means clean out the dead ashes and start from the beginning again to build up. Such a lot of work might have been saved ourselves if the fire only had been taken care of and kept going!

It is a parable of salesmanship. Develop the prospect to a red heat and then go away and forget him for several weeks and, lo! when you come back, he is stone cold—burned out—has forgotten everything you ever told him about your car.

Too many failures of otherwise good automobile salesmen can be traced to the fact that they forgot to pile on the fuel at regular intervals; they went away and forgot it, until one day they saw the prospect drive past in a new car of a competing make.

A definite system of reports with a tickler follow-up, set automatically, as soon as the report is in, backed up by a slip or memo of some kind placed on the salesman's desk the day before the call is due, will prove a satisfactory and efficient cure.

ILLUSTRATING THE TYPE OF MAN WHO LOVES HIS WORK.

An automobile salesman was in a small Ohio town. After seeing his prospect he had just an hour before the car would be due to take him back to Dayton, so he went up to the hotel and got into conversation with the proprietor. Of course, he talked automobiles and told about his line of cars. Before the electric car was due he had the names of several prospects in the vicinity, and among them was the name of the hotel man, who let out that he had been considering the purchase of an automobile for some time. The sequel to the story is that a week later he drove back with a machine which the hotel keeper is now driving.

Genuine Salesman Not a Machine.

A real salesman loves his work. He finds it more interesting than anything else in the world; he does nothing mechanically, but has his eyes and his ears continually on the alert to get information that will lead him to interested people. And such a man gets the help and support of those with whom he comes in contact. They know he is "on the job" and keen for business, and he stands out from the rest like a powerful headlight amidst a group of dash lamps.

Study the most successful men you know, men who are really big, and you will find that, without exception, they are men who love their work for its own sake.

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ONE TYPE OF CARBURETTER FOR MANY TYPES OF MOTORS

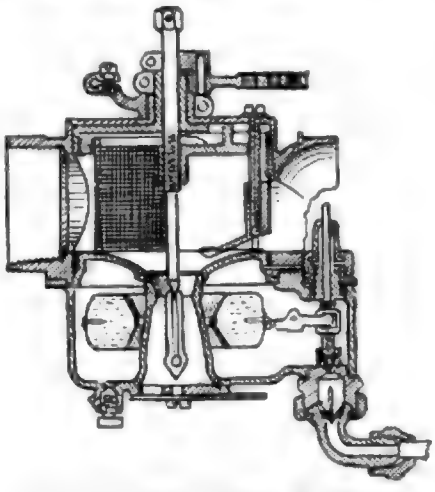
Gassifying Device That Is Designed to Make Any Engine Do Its Best—Has Wide Range of Adjustment.

Designing a carburetter for one particular type of motor with a view to obtaining maximum efficiency from that motor is by no means a simple task; but when it comes to producing a carburetter that will be equally efficient for all engines, regardless of their individual peculiarities, difficulties multiply. It is a task of no small magnitude, yet the Detroit Carburetter Co., of Detroit, manufacturers of the E. C. B. carburetter, shown in the accompanying illustration, claim that this is precisely what they have accomplished and that the instrument will cause any motor to work up to its maximum efficiency.

As may be seen quite clearly, the carburetter is of the central jet type, the vertical gasolene nozzle being placed in the center of a venturi tube passing through an annular float chamber. Above the venturi tube is a mixing chamber of large proportions, from which the mixture passes to the induction pipe through the usual throttle, its passage leading through a screen of wire gauze placed over the outlet. The hole in the gasolene nozzle is of large diameter, but its opening is adjustably restricted by a needle-valve, the stem of which extends downward from the top of the mixing chamber, where it passes through a threaded hole. The projecting end of the stem passes through and is clamped to the throttle lever, which swings horizontally; thus when the throttle is opened, the needle is screwed up and the nozzle aperture area increased in proportion to the throttle opening, while the closing of the throttle closes the needle valve. The throttle itself is of the apertured cylinder type and works within the mixing chamber walls. By loosening the needle-valve clamp the valve can be adjusted for any maximum area of opening and the adjustment retained by tightening the pinching screw.

There are two air intakes, both adjustable as to area and neither fitted with automatic valves; in fact, the only automatic valve in the carburetter is the float valve, which is of the usual needle type, with a novel adjusting device, however. One of the air intakes is at the bottom of the venturi tube and is provided with a shutter or plate for regulating the aperture area. The other opens directly into the mixing chamber and is arranged with a deflector which forces the air to pass horizontally over the top of the venturi tube; the area varies with the throttle opening, there being simultaneous movement of throttle and air valve. As this air inlet is opposite the outlet, the incoming air picks up and mixes with the gas rising from the venturi tube and passes straight along to the outlet without bends or turns. A screw regulates the height of the air baffles, thus governing the amount of air admitted.

One feature of the gasolene system will be appreciated by those who have taken out floats and bent the levers by guess to adjust the level of the liquid. The stem of the automatic needle valve is threaded and passes through a nut which engages with the end of the usual float lever. The stem is continued upward and passes through a guide, the stem being flattened and the hole in the guide being of corresponding shape,



E. C. B. CARBURETTER IN SECTION

so that the stem cannot turn in the hole. The guide is arranged to turn when a locking nut is loosened. Turning the guide, of course, turns the valve stem, which works through the thread in its nut and so is raised or lowered, correspondingly raising or lowering the level of gasolene in the bowl. Adjustment can be made when the motor is running if desired. The adjusting guide is fitted with lugs and notches and cannot be moved unless the lock is loosened; also, it is easy to keep track of the distance through which the stem has been turned by counting the notches.

The operation of the carburetter is clear enough, in a general way, from the illustration. Air is drawn in through the two inlets; the air from the lower inlet passes the spray nozzle whirling rapidly, the venturi tube being provided with a spiral for producing this effect. The amount of gasolene taken up is dependent upon the adjustment of the valve and the throttle opening. The secondary air current, carrying no gasolene, joins the first at the top of the venturi tube, and the violent agitation resulting from the abrupt changing of directions produces a thorough mixing of the gas and air. The secondary air current, as well as the gasolene nozzle opening, is controlled concurrently with the throttle, so that the proportions of the mixture are always correct providing the proper initial adjustments have been made.

Due to the wide range of proportional adjustment possible in the E. C. B. carburetter, it is claimed that it can be adapted to any motor, either two-cycle or four-cycle, though in a three-cylinder, two-cycle, three-port motor it is necessary to use a special distributing device if but a single carburetter is employed. The total absence of springs and automatic air controlling devices makes adjustments permanent, once effected, and it is claimed that it is impossible to improve the action of the device by the use of any of the many carburation improvers on the market, for the simple reason that the carburetter will make the engine do its best without extra attachments.

Overworking the Magneto's Safety Gap.

Although all high tension magnetos are fitted with a safety gap for the passage of the spark when the magneto is disconnected from the spark plugs or the gap in the plug has become too large for the passage of the current, it is not well to overwork the gap, as each time the current passes through it the points are burned slightly, similarly to the points of the plug. In testing the plugs for short circuit, therefore, it is much better practice to touch a screwdriver to the terminal and hold the point in proximity to the motor jacket than to remove the wire from the terminal and incur the risk of rendering the safety gap incapable of passing the spark to the detriment of the armature insulation.

Mirror for Day and Night Use.

An exceptionally handy device to carry in the tool box is a small mirror. The reflector is not only useful for directing the line of vision into places which otherwise would be invisible, but it also can be made to serve instead of a trouble lamp when something goes wrong at night. For such usage it simply is necessary to reflect a beam from a nearby street light to the point where illumination is desired.

Adjusting Valve Tappets and Stems.

Before attempting to adjust the distance between the valvet tappets and the valve stem so as to insure perfect functioning of the valve mechanism and the elimination of noise, it is well to polish the valve and its seat in the orthodox manner. This ensures the removal of all particles or carbon and perfect seating of the valve so that the final adjustment is perfect.

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GIVING DEALER BENEFIT OF POSSIBLE BARGAINS

Reilly Tells Sales Manager What He Thinks of Manufacturers Who Prefer Used-Car Men to Own Dealers When Unloading at Reduced Rates—Declares Regular Dealers Should Have Choice of "Good Things."

In compliance with the shouting of a youngster who frantically waved a red flag, made from one of those garments which have been dispensed with since the entry of the hobble skirt, the Sales Manager, grip in hand, halted at the intersection of two streets as he saw the cause of the youthful flagman's demonstration—a pair of bobs with a merry load speeding down the cross street; the Sales Manager felt the thrill of boyhood days as he saw from the distance of a block that the hindermost passenger on the speeding contrivance was a full-grown man who clutched a black cigar between his teeth and evidently had forgotten that such antics are not regarded as decorous for a business man in his thirties.



WHEN REILLY CAME DOWN THE BOBS WERE HALF WAY ACROSS THE STREET

Reilly Returns to Boyhood Days.

The Sales Manager's face began to nurse a smile as the bobs drew nearer and he recognized the "man behind"; he was about to yell at him, but just then the bobs hit a hump at the crosswalk, the tail of the board flipped upward, the man flipped upward, too, his hat started to continue upward, the man relaxed his grip on the board to grasp his hat, and was successful in gripping the hat, but when the man came down the bobs were half way across the street and the absence of one passenger never was missed at all. Which is not to say that Reilly ceased to slide, for for the space of twenty feet he proceeded to demonstrate that in an emergency a pair of well-tailored trousers are fully as efficient as a pair of bobs.

"Didn't you like the company you were in?" asked the Sales Manager, as Reilly gathered himself, and the questioner put a stoppage to his mirth long enough to get breath for the question.

Youngsters Too Fast for the "Old Man."

"Too fast for the old man, I guess," replied Reilly, as he grinned like a ten-year-old boy caught walking home with his fiancee, and continued to brush off the snow and dirt which he had accumulated.

"Do you spend all your lunch hours in recreation?" bantered the Sales Manager.

"First offense," confessed the dealer, "and," he added, "the last. I thought I would walk up to the house to lunch and back to-day and the kids offered me a ride part way to the store."

"Well, you rode—part way," said the Sales Manager, "and since there aren't any more kids to play with, suppose you join me in the walk the rest of the way." Wherefore the two wended their way together toward "Automobile Row." They argued and scrapped as usual about anything and everything on which it was possible to differ in opinion, and were just about to become involved more deeply in a discussion in which an agreement was an improbability when there loomed up before them a dealer's salesroom front over which was plastered big bargain-day signs announcing "Cars at cost—Going out of business."

"What's the matter with Montrose?" asked the Sales Manager as they passed the over-displayed layout of signs.

"Going out of business," replied Reilly.

"I suppose I can't read, can I?" retorted the Sales Manager. "The sign didn't say he was going out of business, did it? What the kids did to you must have made you sore—mentally, I mean."

Dealer Aggrieved at Factory's Act.

"He gave up his dealership," explained the ex-coaster. "He got sore—mentally, I mean."

"At what?" queried the man with the grip.

"At the factory," answered Reilly, and as the little dealer saw a cloud of wrath begin to darken the Sales Manager's features at this unexplaining explanation the former hastened to add. "He claimed the factory handed him a misdeal on a little transaction, so he told them they could take their agency and select a destination if they didn't care to go where he told them to go."

"Is he right or wrong? What happened, anyway?" was the inquisitive response.

"I think he's right in his contention, but he was a little hasty when he threw up his agency," stated Reilly. "It all occurred because his factory over-produced and had to unload quite a few cars several months ago; Montrose, or Monty, rather, as he is known along the 'row,' didn't know anything about it until a few weeks ago, and when he discovered the true state of affairs he went up in the air.

"It seems that when the factory found it had made more cars than the dealers had contracted for and that there was likely to be a surplus, somebody down there made

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arrangements and unloaded the whole lot onto several used car dealers in half a dozen cities at greatly reduced prices. The used car dealers got a good thing out of it, and the factory got rid of its surplus, but a lot of dealers have raised a fine row about it. Monty, for instance, found out that several new Hannon cars were running around town and he was darned sure he hadn't sold them, so he started an investigation. One of the men who has one of them told Monty he got the car from a used car dealer out of town, told him who the dealer was, and what he paid for the car.

Finds Himself Undersold by Factory.

"The price was considerably less than Monty could afford to sell for, even if he cut his prices, and the car actually was new and unused when the man bought it. Monty took the matter up with the factory and asked how it happened that so many new cars were being sold by the used car dealer; the factory seemed perfectly willing to explain and apparently thought nothing improper had been done when the lot of cars was sold to the used car men. But Monty was pretty quick to show them something was improper. He said the cars were being sold to his prospects, and he demanded to be told why he hadn't been given a chance to buy in some of the cars at a cut rate.

"The sales department told him they had not thought he would want any. He asked them why they hadn't found out, instead of merely thinking he didn't want any. Then they told him he had contracted for a certain number of cars and they didn't think he could sell any more in his territory. Monty asked them if they didn't think he could sell as many in his own territory as a used car man could who was 50 or 100 miles away. He didn't succeed in getting much satisfaction, and after the matter had dragged along for two or three weeks he went down to the Hannon factory, broke his contract and told them they could sue if they wanted to."

"Fine chance of their suing!" commented the Sales Manager.

Futile Effort to Make Reparation.

"Quite right!" agreed Reilly, "but his trip to the factory caused some of the higher-ups to learn about the rumpus; it seems they hadn't known of it before. They say that somebody lost his job, or nearly lost his job, or something like that, and they tried to get Monty to stick, but he said he was glad he had a good excuse to quit and came down the same day and had that big 'bargain sale' sign painted."



"HE CLAIMED THE FACTORY HANDED HIM A MISDEAL," EXPLAINED REILLY

"What's he going to do?" asked the factory man.

"I don't know," answered Reilly, "but he'll do something; he's a ripping good man at a lot of things. But I think he got a rather raw deal. If I——"

Another Instance of Misplaced Bargain.

"That kind of work ought to be stopped in this trade, and every other trade," asserted the Sales Manager. "It's too darned common. We ran up against an instance of it ourselves a few years ago."

"You did?" said Reilly in surprise.

"You'd be surprised, too, when I tell you who did it," stated the salesman. "It was Mason & Co., the windshield concern. You'd naturally think they were on the level, but one day we got an offer from a certain dealer in job lots of any old thing for a lot of windshields at a price that made us think something was wrong. We looked it up and found the Masons had been doing the same thing the Hannon factory did."

Giving "Good Things" Where Not Due.

"That makes a regular dealer sore," said Reilly, with a closed-fist gesture. "Here a firm has a line of regular dealers who stick through all kinds of weather and push a firm's goods, and then the minute any kind of a bargain like that shows up the firm hands the gift to some jobber or cut-rate dealer who wouldn't touch the firm's goods if he had to pay regular prices.

"I never could see why, if a firm has any bargains like that, they don't give their own regular dealers first chance at them. Monty says that one of his dealer friends was let in right on such a deal once and he cleaned up a good bunch of money; Monty says he could have made several hundred dollars and taken his regular contract of cars, as well, if he could have bought a few cars at the price the used car man paid for them. As it is, he's selling out at prices that would make a used car dealer look sick."

Weak Excuse for an Unfair Practice.

"Sometimes the argument that is advanced as an excuse for such a deal," supplemented the Sales Manager, "is that it isn't good policy to sell a dealer anything at less than his regular prices for fear he will get into the habit of expecting cut rates or will hold off on his orders in the expectation that there is going to be a bargain sale which will enable him to make a bigger profit on regular retail orders that he already has in hand. Of course, I myself don't think that is exactly fair, but it may be all right in some trades; certainly, however, it is all wrong in the automobile trade, where a small dealer doesn't sell, perhaps, more than five or ten cars a year."

Square Methods and Their Result.

"You people have been pretty square that way," was Reilly's compliment. "I like the way you handle some of the used car bargains you have, too, such as letting the dealers know you have such-and-such a car on hand at a good price. Lots of times a dealer has a prospect for just such a car, and it helps wonderfully all around."

By this time the two men had entered Reilly's office and the Sales Manager was telling Reilly's salesman a glowing tale of his employer's afternoon performance on the coasting hill, when Reilly, who had been sitting uneasily at his desk for as much as a half minute, solemnly walked out to the repair shop and in a moment returned, bearing a cushion from a repairman's working couch, mute evidence of the fact that the Sales Manager was not exaggerating.

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BOSTON'S "BABYLON" SHOW PROMISES TO PROVE WORTHY OF ITS PREDECESTORS

To Open Saturday Evening With a Decorative Setting Both Striking and Original and With a Full House of Cars, Accessories and Other Things, Including Dictionaries—At Least Six Cars Not Seen at Either of the National Shows Among Those To Be Displayed.

The Boston show opens its doors on Saturday night, 8th inst. And it closes them again finally on the 25th. But between those dates there will be a blank of three days—16th, 17th and 18th—to permit the pleasure cars, shown by the Boston Automobile Dealers' Association, to be moved out, and the commercial vehicles, shown by the Boston Commercial Vehicle Association, to be moved in. Mechanics' Building, of course, is where the stage is set, and if previous Boston shows can be taken as a criterion there will be much in the way of automobiles and accessories and—er—other things within the four walls to interest the visitor.

All of which may or may not bring to mind the "other things" that served to relieve the monotony of previous years—the "honest-to-goodness-sure-enough-ivory" novelties promiscuously vended, the pink lemonade and grape juice and the dictionaries. Diligent search has failed to unearth any real reason for the presence of the dictionaries, but as their vendor has appeared regularly at the Boston exhibition, he must find it beneficial. It is understood that at one show at least two of the dictionaries were sold and that the purchasers immediately turned to the word "culture" and were so astounded at what they found that they quit Boston within the hour. They may return properly fortified this year.

However, the Boston show is first and foremost an automobile show. It always has been uncommonly well and attractively dressed and one from which several several lessons might be learned by others less successful in disguising gaunt rafters and unsightly walls into eye-pleasing backgrounds at moderate expense. For ever since the Bostonians first inaugurated the idea of uniform decorations they have been going themselves one better, so to speak, each succeeding year. And this year, with such decorative themes as the "Hanging Gardens of Babylon," "Nebuchadnezzar's Tribute to His Median Bride," "The Garden of a Century Ago" and other equally inspiring subjects the decorative scheme and scene that will be disclosed Saturday night should be just a little better than those of yesteryears.

Under all this glory there will be shown a long list of accessories, some of which are new and rarely seen outside the Boston show and some which are not so new because they already have been revealed either at the New York show or at the Chicago function, and a list of cars to which the same concrete description applies. Which is to say that nearly all the old familiar names will be there and, in addition, there will be six others which appear for the first time this year on any show signpost other than those erected in purely local exhibitions. Two of them are electrics—Bailey and Grinnell; three are gasolene—Ford, Nyberg and Moyer—and one is a steamer—Stanley. The complete list of car exhibitors is as follows:

Pleasure Cars.

Anderson Electric Car Co., of Boston, Boston, Mass.—Detroit electric.

American Locomotive Co., Providence, R. I.—Alco.

Andrews-Dykeman Co., Boston.—Moon.

Armstrong & Curtis Co., Boston—Marathon.

Bailey & Co., S. R., Boston—Bailey electric.

Borland-Grannis Co., Chicago, Ill.—Borland electric.

Bowman Co., J. W., Boston—Stevens-Duryea, S. G. V., and Waverley electric.

Buick Motor Co., Boston, Mass.—Buick.

Bergdoll Motor Co. of Boston—Bergdoll.

Binney, J. A., Boston—Henderson.

Briggs-Detroiter Co., Detroit, Mich.—Detroiter.

Cadillac Automobile Co. of Boston—Cadillac.

Connell & McKone Co., Boston—Overland.

Curtis-Hawkins Co., Boston—Speedwell.

Case Threshing Machine Co., J. I., Racine, Wis.—Case.

Cutting Motor Car Co., Boston—Cutting.

Dodge Motor Vehicle Co., Cambridge, Mass.—Buffalo electric.

Dutton Motor Co., F. A., Boston—Abbott-Detroit.

Donovan Motor Car Co., Boston—Studebaker.

Davis Carriage Co., Geo. W., Richmond, Ind.—Davis.

Fiat Motor Sales Co., Boston—Fiat.

Ford Motor Co., Boston—Ford.

Franklin Motor Car Co., Boston—Franklin.

Fuller, Alvin T., Boston—Packard.

Habich Co., G. E. & H. J., Boston—Cole.

Harrington-Thompson Motor Cars, Inc., Boston—Krit.

Hoyt Carburetter & Auto Co., Boston—Havers.

Henley-Kimball Co., Boston—Hudson.

Hollander Motor Co., Boston—Metz.

Imperial Automobile Co., Jackson, Mich.—Imperial.

Inter-State Automobile Co., Boston—Inter-State.

Jackson Motor Car Co., Boston—Jackson.

Jeffery Co., Thomas B., Boston—Rambler.

Koehler Sporting Goods Co., H. J., Boston—Hupmobile.

Lawrence & Stanley Co., Boston—Mitchell.

Lenox Motor Car Co., Boston—Lenox.

Lewis, C. B., Cambridge, Mass.—Nyberg.

Linscott Motor Co., Boston—Reo.

Locomobile Co. of America, Boston—Locomobile.

Lozier Motor Co. of New England, Boston—Lozier.

MacAlman, J. H., Boston—Stearns, Columbia.

Maguire Co., J. W., Boston—Pierce-Arrow.

Michigan Motor Car Co., Kalamazoo, Mich.—Michigan.

Middleboro Auto Exchange, Middleboro, Mass.—McFarlan.

Morse & Co., Alfred Cutler, Boston—Renault, Metallurgique.

Moyer, H. A., Syracuse, N. Y.—Moyer.

Motor Car Mfg. Co., Indianapolis, Ind.—Pathfinder.

Neale, A. F., Boston—Baker electric.

Oakland Motor Co., Boston—Oakland.

Oldsmobile Co. of Massachusetts, Boston—Oldsmobile.

Peerless Motor Car Co. of New England, Boston—Peerless.

Paige-Detroit Motor Car Co., Detroit, Mich.—Paige.

Pope Mfg. Co., Hartford, Conn.—Pope-Hartford.

Premier Motor Car Co. of New England, Boston—Premier.

R. C. H. Corp., Boston—R. C. H.

R & L Co., Boston—Garford.

Republic Motor Co. of Massachusetts, Boston—Little and Chevrolet.

Roberts-Sherburne, Inc., Boston—American.

Russell Co., W. L., Boston—Regal, Haynes.

Smith, Fred S., Boston—Mercer.

Stanley Motor Carriage Co., Newton, Mass.—Stanley.

Stevens, W. H., Boston—National.

Stutz Motor Car Co., Boston—Stutz.

Tyler Bros. Corp., Boston—Firestone-Columbus and Columbus electric.

Underhill Co., Boston—Knox, Grinnell electric.

United Motor Boston Co., Boston—Maxwell, Stoddard-Dayton.

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Velie Motor Vehicle Co., Boston—Velie.
White Co., Boston—White.
Whitten-Gilmore Co., Boston—Chalmers and Woods electric.
Wing Motor Car Co., Boston—Marmon.
Winton Motor Car Co., Boston—Winton.
Westcott Motors Co., Boston—Westcott.

Accessories.

Of exhibits of accessories, the following did not appear at either the New York or Chicago shows:

Adams, John Quincy, Boston—Dictionaries.
Aetna Life Insurance Co., Boston—Insurance.
American Storage Battery Co., Cambridge, Mass.—Storage batteries.
Auto Parts Co., Providence, R. I.—Parts.
Bartlett, Edwin E., Boston—Tools.
Boston Tire & Rubber Co., Boston—Comet tires, liners, etc.
Boyd, Shirley F., Boston—R. I. V. ball bearings.
Burn Boston Battery & Mfg. Works, Boston—Sealed liquid batteries.
Cataract Rubber Co., Boston.—Tires.
Chandler & Farquhar Co., Boston, Mass.—Machine tools.
Clark Foundry Co., Rumford, Me.—Machine tools.
Columbia Tire & Top Co., Boston—Tire and tops.
Coward Auto Supply Co., Boston—Star speedometers, J-M shock absorbers and other supplies.
C. R. G. Mfg. Co., Saugus, Mass.—C. R. G. carburetters.
Crowell Chemical Co., Beverly, Mass.—Oxford polishes.
Dunn Ray Co., Boston—Specialties.
Eagle Oil & Supply Co., Boston—Eagle lubricants.
Edison Storage Battery Co., West Orange, N. J.—Edison storage batteries.
Eisner-Lenk Co., Boston—Eisemann magnetos.
Elliott Motor Engine Co., Waltham, Mass.—Motors.
Ernsdale Worcested Co., Clinton, Mass.—Fabrics.
Forbes, Walter J., Boston—K-W ignition devices.
Ford Co., Percy, Boston—Supplies.
Grady & Co., J. W., Boston—Motorcycles and supplies.
Globe Wrench Co., Ipswich, Mass.—Wrenches.
Hillman Auto Supply Mfg. Co., Boston—Brass and plated specialties.
Holtzer-Cabot Electric Co., Brookline, Mass.—H-C lighting systems and Newcomb carburetters.
Holt & Behee Co., Boston—Lamps and electrical specialties.
Hood Rubber Co., Watertown, Mass.—Tires.
Hopewell Bros., Newton, Mass.—Tool bags, tire covers, etc.
Invader Oil Co., Boston—Invader lubricants.
Jones Speedometer, New Rochelle, N. Y.—Jones speedometers and recorders.
K-D Motor Co., Brookline, Mass.—K-D crescent valve motors.
Kelleher, J. J., Dorchester, Mass.—Typhoon signals.
Keystone Lubricating Co., Boston—Lubricants.
Kelham, J. F., Beverley, Mass.—Supplies.
Linscott Supply Co., Boston—Accessories.
Lunt Moss Co., Boston—Pumping and lighting plants.
Meyers Bros., New York City—Specialties.
Michelin Tire Co. of Massachusetts, Boston—Michelin tires.
Moore-Smith Co., Boston—Wearing apparel.
Motor Parts Co., Philadelphia, Pa.—Auto Cle wrenches.
Norton Co., Worcester, Mass.—Machine tools.
New England Motorcycle Co., Boston—Motorcycles.
Orona Mfg. Co., Boston—Specialties.
Philadelphia Grease Mfg. Co., Boston—Lubricants.
Raymond Engineering Co., Boston—R-V motors.
Reinhart, Geo. W., Boston—
Reliance Speedometer Co., Boston—Reliance speedometers.
Robinson & Sons Co., Wm. C., Boston—Lubricants.
Rose, P. R., Boston—Specialties.
Russell & Co., T. F., Boston—Leavett timers, Minerva horns, Victor lamps, etc.
Salman, John A., Boston—Monograms.
Sawyer Oil Co., John B., Boston—Lubricants.
Shannon, T. R., Hartford, Conn.—Polishes.
Standard Auto Supply Co., Boston—Rhineland, R. B. F., and Fafnir bearings, Shaler vulcanizers, etc.
Standard Tire & Rubber Co., Boston—Imperial and Standard tires.
Steel Specialties Co., Boston—Specialties.
Underhay Oil Co., Boston—Lubricants.
Walker Lithograph & Pub. Co., Boston—Maps.
Walpole Tire & Rubber Co., Boston—Walpole tires.
Ward & Sons, Edgar T., Boston—Tubing and tools.
Winship, W. W., Boston—Trunks and bags.

Garden Setting for Tennessee Show.

Thirty-eight different makes of automobiles of both pleasure and commercial types, displayed in a Southern garden setting improvised of trailing smilax and rambler roses disposed on lattice bowers, comprised the third annual show of the Memphis Automobile Trade Association, which closed its doors in the Memphis Auditorium on Saturday evening last, March 1st. The cars were displayed by some 31 automobile dealers, who held space throughout the week—the doors opened on Monday morning, April 24th. Accessories of all types were shown by the 15 dealers in appurtenances.

The cars displayed were: American, Alco, Buick, Case, Chalmers, Chandler, Detroit electric, Maxwell, Ford, Garford, Hudson, Hupmobile, I-H-C truck, Kelley truck, Little, Lozier, Marmon, Moon, Moline, Michigan, Overland, Palmer-Singer, Premier, Pilot, Pullman, Rambler, R. C. H., Standard electric, Stearns, Speedwell, Studebaker, Urban, Waverley electric, White, Wilcox.

Denver Discloses Three New Vehicles.

When on Saturday night next, March 8th, the curtain is rung down on the exhibit which has been housed in the Denver Auditorium since Tuesday evening, the Colorado city will have seen its "dozenth" annual automobile show. It is being held under the auspices of the Denver Automobile Dealers' Association. Thirty different makes of automobiles for both pleasure and commercial purposes are shown by the two dozen dealers who hold space; of the trucks, three are new in the sense that they have not before been on exhibit during the present show season. They are the Continental, made by the Continental Motor Truck Co.; Capitol, displayed by the Capitol Truck Mfg. Co. and the Zimmerman tractor, which is exhibited by the Auto Tractor Co., the latter of which is novel in that it combines both a pleasure car and a farm tractor. The Fritchle electric, which is the product of the Fritchle Auto & Battery Co., of Denver, is the only newcomer in the pleasure car field. Accessories are shown by some 16 dealers in motor car appurtenances. The cars exhibited are: Lozier, Reo, Ohio electric, Abbott-Detroit, Paige-Detroit, Michigan, Oldsmobile, Waverley electric, Pathfinder, Hupmobile, Inter-State, Wichita truck, R. C. H., Overland, Apperson, Kissel, Fritchle electric, Stutz, White, Marion, Cartercar, Zimmerman tractor, Continental truck, Mercury truck, Dorris, Stanley, Baker electric, Little, Selden, Locomobile, Case, Capitol truck, Blair truck.

Street Parade Precedes Elmira's Show.

Red fire, a brass band, and the usual "fixings" that accompany a street parade marked the opening on Monday evening, February 24th, of the third annual show of the Elmira (N. Y.) Automobile Club, which held forth in the State Armory until Saturday evening last, March 1st. The displays of the motor car dealers who held space embraced some 15 different makes of vehicles, as follows: Paige, Pathfinder, Ford, Cadillac, Haynes, Overland, Palmer-Singer, Chalmers, Studebaker, Hupmobile, Atterbury truck, Pierce-Arrow, Cole, Buick, Detroiter. In addition, there were 13 exhibits of accessories.

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AMERICAN UNDERSLUNG ADDS FIRST SIX-CYLINDER MODEL

Employs Long-Stroke Block Motor of Unusual Compactness and Devoid of External Pipes—Traveller Features Retained.

After having permitted others to feel out the market for the six-cylinder car, and having itself successfully performed the feeling operation for underslung construction, the American Motors Co., of Indianapolis, Ind., at length and after careful preparation has launched a model combining these two features in the newest addition to a line that long has been one of the leading exponents of the principle of underslung frame construction. As might have been expected, the new car has a number of features in common with its predecessors, though it differs from them radically in a number of others, not the least significant of which is the employment of an unusually compact T-head, block-cast motor, in which even the water pipes have been eliminated by incorporating them within the casting. The car is designed to sell for $4,500, the price including complete equipment quite as a matter of course. It is styled Type 666, the figures serving to indicate that it employs a six-cylinder, 60-horsepower motor and the body accommodates six passengers.



AMERICAN UNDERSLUNG "SIX," VICE-PRESIDENT MENASCO AT THE WHEEL.

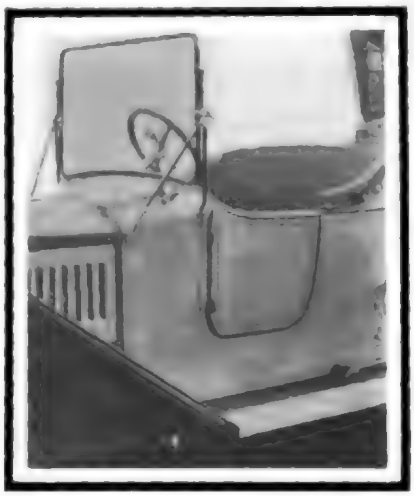
Barring the compact appearance of the motor, which, by the way, measures 4½ x 6 inches and delivers 65 horsepower at 1,000 revolutions, its most conspicuous feature is the absence of water piping and the miscellaneous other odds and ends usually considered essential to proper and efficient operation. Instead of being conveyed to the cylinders through outside pipes, the circulating water is led directly into the cylinder casting from the radiator, the passages being cored integral. Full advantage is taken of this method of construction thoroughly and adequately to cool the valves and stems, which feature, it is pointed out, effectually obviates the possibility of unequal distortion and consequent sticking or breakage. Permitting more effective distribution of the cooling water through the radiator, two inlets are provided, with a branched T-shaped header. Draft through the tubes is induced by a cast aluminum fan with ample provision for taking up the slack in the driving belt.

Conforming to modern practice, both intake and exhaust passages, as well as water passages, are cored integral with the casting. Thus, it becomes a comparatively simple matter to eliminate the usual intake manifold and to substitute for it a comparatively short pipe leading directly from the carburetter to the side of the casting, the disagreeable tendency of some of the slightly heavier grades of fuel to "load up," or condense en route to the cylinders by reason of long passages, being obviated. Incidentally, the construction permits of the carburetter being placed fairly high where it is instantly accessible for adjustment. Oil pipes also are contained within the casting and the effect of "cleanness" which prevails is heightened by the use of closely fitting valve mechanism covers and webs cast between the supporting arms and the side frame members to prevent the ingress of road dirt.



AMERICAN TANK SUPPORT

Leaving the intake side of the motor perfectly clear except for the presence of an electric horn, which forms part of the regular equipment, the high tension magneto which provides ignition energy is mounted on the left side, together with the water pump and the electric lighting and engine starting equipment. Thus, in addition to facilitating carburetter adjustments, the location of the magneto on the opposite side effectually reduces the fire hazard due to the ordinary juxtaposition of these two essentials. The lighting and starting equipment is mounted on a substantial base and is driven through the intermediary of solid shafts to the timing gear train, which has been proportionately strengthened to perform its added work. Consequently, the usual forms of flywheel gearing and "silent" chains are conspicuous by their absence.



INTEGRAL WINDSHIELD AND LAMPS

In the matter of a clutch, American engineers have found little room for improvement in the cone type that has been used for so many years in the Traveller models, and hence that type has been adopted in its entirety except that a few minor refinements have been made. Thus, for instance, the combined helical and spiral spring which holds the clutch in engagement is retained quite as it has been used in the past. It is equipped with a ball thrust bearing to take the end load and ball bearings on the clutch bushing and the yoke successfully eliminate friction at these points. Similarly, the change speed mechanism is substantially the same as that used in the Traveller models, with a few minor improvements. Gears are large of face, of high grade alloy steel and are cut to close limits to eliminate the usual growl that emanates from "down below" when running on low speed. Four speeds forward and reverse are provided, both lay and drive shafts being mounted in large diameter im-

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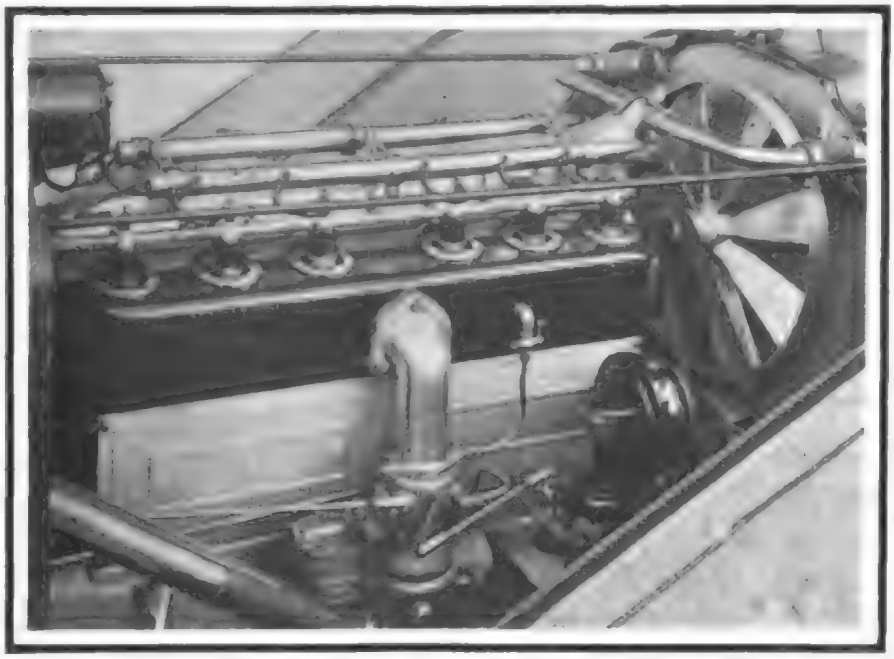
ported ball bearings. Shifting rods are supported in exceptionally long bearings and are fitted with positive locks, making gear shifting easy and certain.

From the gear box, power is transmitted to the rear wheels in the orthodox manner through the intermediary of a propeller shaft enclosed in a drawn steel torsion tube made fast at the after end to the axle housing, which is of the built-up type in which the axle tubes are rigidly fastened to a cast steel differential housing. The top half of the housing is removable without the necessity for disturbing any other part of the axle, and the entire differential mechanism can be lifted out through the opening. The axle itself is of the full-floating type in which the weight of the car is supported on large annular ball bearings. In the case of the drive pinion and the ring gear, the bearings are mounted in adjustable cages.

Naturally, the front wheels also are mounted on large diameter annual ball bearings, though it is one of the distinctive features of the car that a double thrust bearing is provided. Both sets of brakes, service and emergency, are equalized and are mounted inside rear wheel drums which measure 16 inches in diameter; each brake band is two inches in width, thus providing sufficient braking surface to bring the car up "all standing" if necessary. The steering gear is of the irreversible worm and sector type and is mounted in special bearings to ensure easy operation.

In the design of the frame and the method of suspension, the construction differs in no whit from that already made familiar by previous Americans. The frame is carried beneath the axles, the immediate effect of which—it scarcely is necessary to point out—is materially to lower the center of gravity and thus to increase stability. Both front and rear are supported on unusually long and flexible semi-elliptic springs. One slight departure from previous practice is to be found in the method of hanging the gasolene tank at the rear, the construction, which is exceptionally solid and provides more than ordinarily complete protection for the tank being best made plain by the accompanying picture.

The chassis is fitted with a roomy six-passenger touring body in which the effort at the elimination of projecting parts is reflected by the absence of door hinges and latches and the clever manner in which the side lamps have been almost hidden in miniature tunnels. Incidentally, the windshield is no more an accessory than is any other part; it is built in place without the use of the usual filler board and the struts are so placed as to offer the least possible obstruction to the driver's vision.



INTAKE SIDE AMERICAN "SIX," SHOWING ABSENCE OF PIPING

The standard equipment of the car, all of which is included in the price, embraces a specially designed disappearing mohair top with the usual slip cover and side curtains, electric lighting and engine starting system, 100-mile electrically lighted speedometer-clock combination, adjustable windshield, electric horn, shock absorbers, demountable rims with two spares, robe and foot rests, and the usual complement of tools, tire repair kit, pump, jack and spare parts.

Read Makes Ready an $850 Model.

Having finally perfected its organization by the election of R. J. Read as president, Roy Herald as secretary and J. E. Beatty as treasurer, the Read Motor Car Co., of 541 Woodward avenue, Detroit, Mich., which for some time has been in process of formation, at length is ready to market its first product, an orthodox five-passenger touring car styled the Read "30," which lists with complete equipment at $850. The car mounts a four-cylinder unit power plant in which the cylinders are pair-cast and measure 3¼ x 4½ inches; ignition is effected by means of a high tension Briggs magneto and mixture is furnished by a Holly carburetter. The other essential elements of the car include a three-speed selectively operated gearst with the control lever in the center of the footboard, leather-faced cone clutch and semi-floating rear axle. Rear springs are full-elliptic, with the lower halves hung beneath the axle and the front members are semi-elliptic. The wheelbase is 115 inches on 32 x 3½ Goodyear tires carried on demountable rims. Equipment includes top, windshield, speedometer, gas head lamps and tank, and the usual horn and tool complement.

Kelly Truck's Branches Reorganized.

Since Charles B. Shanks assumed charge of the Kelly-Springfield Motor Truck Co.'s sales department, its system of branches and service stations, among other things, has been considerably reorganized, a number of new men having entered the service. As reorganized, the branches and their managers are as follows: New York City, N. Y., A. S. Holly; Cambridge A, Boston, Mass., P. S. Aultman; Philadelphia, Pa., James Joyce; Kansas City, Mo., Charles B. Packham; Chicago, Ill., L. R. Garrison; Seattle, Wash., Henry E. Schmidt; San Francisco, Cal., Frank G. Miner; Los Angeles, Cal., J. L. Stone (assistant branch manager in charge); Dallas, Tex., A. R. Hayden; Cleveland, Ohio, D. C. Hathaway; Birmingham, Ala.

A. C. A. Decides to Retain Laboratory.

It has been decided by the Board of Governors of the Automobile Club of America that the club's fine testing laboratory, the discontinuance of which was practically decided upon because of the expense involved in its maintenance, is to be retained. The work will even be carried further than the laboratory itself permits, for it is planned to make road tests of cars and accessories—carburetters, tires, ignition apparatus, cooling systems and so on. In making road tests the A. C. A. is following the example of foreign organizations, which have done work of this character for dealers and manufacturers.

The Firestone Tire & Rubber Co. has opened a branch in Milwaukee, Wis., at 456 Milwaukee street. It will be managed by I. E. McGinnis.

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WEEKLY SERVICE SYSTEM THAT HOLDS TRADE

How a Southern Dealer Takes Care of His Customers With the Aid of a Card and a Punch—Simple Method of Keeping Track of Adjustments, Repairs and Replacements—Thoroughness the Keynote of Success.

Just how far-reaching should be the service accorded the purchaser of a motor car by the dealer is a subject regarding which there probably always will be divergent opinions. All, or very nearly all, are agreed, however, that service in one form or another pays. There are those who believe that, like everything else, as a profit yielding medium it has its limitations; and though this class is in the majority, there is none within its scope who is prepared to say exactly where lies the dividing line between profitable and non-profitable varieties of service, or, in other words, between judicious advertising and pure philanthropy. A second class believes that the dealer never can accord the purchaser service that in the long run will not net the party of the first part a profit.

Fifty-two Weekly Inspections.

To this second class belongs the firm of Joseph Schwartz Co., Ltd., which handles Premier and Buick pleasure cars and G. M. C. commercial vehicles in New Orleans, La. The word "service" pronounced with the Schwartz accent designates a thorough and periodic inspection of each of the cars sold by the establishment. To this end, the card shown by the accompanying illustration is issued to each purchaser of either make of vehicle, and each time an inspection is made a hole is punched in one of the numbered squares which fringe the edge of the card; since the inspection is scheduled to take place weekly, there are in all 52 squares, making the card good for a year's free service, although if at the end of a year from the date of purchase of the car, owing to inability of the owner to take the car to the service station, all of the numbers have not been punched, the service is continued until the car has undergone a total of 52 inspections.

Examinations That Mean Something.

The inspection is reasonably thorough, too. A wrench is put on each nut and bolt and the slack taken up by way of preventing chance loss at an inopportune time; the cylinders are carefully examined and all traces of carbon removed against the possibility of an overheated motor, pitted exhaust valves, and general sluggish functioning. Also, the lubricating system receives its due share of examination at each inspection; in cases where the formation of carbon is excessive or persistent, special care is taken in noting the flow of oil with a view toward determining the cause or causes of the malady and, once determined, correction is made to prevent recurrence of the trouble. Sometimes it is but a readjustment of the means for controlling the supply of oil, and occasionally induces the suggestion to the owner that the grade of oil be changed for one that, with his particular motor, will give better results.



SCHWARTZ'S CHECKING CARD

The motor is turned over slowly and the compression in each cylinder tested; where found to be lacking or faulty, either the valves are ground in or the piston rings are freed in their slots to effect a cure. Valve tappets are adjusted so that the timing always is perfect.

The ignition system does not escape the close scrutiny which is accorded the other parts of the motor and each plug is examined, cleaned, if need be, or repacked in case of leakage or breakage of the insulating medium, and the gap is readjusted to a nicety, compensating for the slight amount of burning which is bound to result from the use of a magneto ignition. Cables and wires which have to do with the high and low tension systems are thoroughly "looked into" by way of eliminating derangements either in the insulation or in the conducting medium itself which are liable to assert themselves when the owner is "twenty miles out," as Joseph Schwartz puts it, with the well-known effect of causing delay and inconvenience; the terminals are readjusted and scraped to insure perfect contact, if need be. The magneto circuit breaker contacts are put in proper adjustment and the bearings given their allotted drop of oil of the proper weight.

Little Things That Are Not Slighted.

Nor is the cooling system neglected; after it has been determined that all joints are perfect and that there are no leaks in the radiator, that the pump is functioning properly and that passages are free from obstruction, the system is well flushed out to eliminate all of the insoluble precipitates which are calculated to cause "furring" of the radiator, and the latter is filled with fresh water.

The "modern" fixings which add luxury to the car are not overlooked. The electric lighting system is gone over and the component parts adjusted, if need be. The commutotor of the generator is "rubbed up" in the proper manner by the proper man, and where the battery voltage is low, the reason for its "lowness" is ascertained and the corrections called for are instituted.

A Sharp Lookout for Tire Troubles.

So much for the motor. The remainder of the car is given the same attention, to the end that the transmission is filled to the proper level with the right sort of grease; the differential case is opened, wear in the bevel gears is compensated for, to eliminate all hum, and the proper lubricant applied. The universal joints do not escape attention and are properly cleaned and greased, and each and every grease cup or oil hole in and about the car which has to do with the lubrication of the running gear comes in for its due share of attention. And what probably appeals to the owner as strongly as the attention given the mechanism of the car is the care with which the tires are inspected and the small cuts and stone bruises cleaned and filled, and the larger bruises, which are liable quickly to develop into seats of tire trouble, vulcanized. Naturally, when much time and ma-

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terial are used, a charge is made, but the constant care of the smaller bad spots does so much toward keeping down tire expenses that the average owner does not mind paying these legitimate bills. Of course, the tires always are inflated to the proper degree.

Just what this sort of service means to the owner is a matter too fully understood by all those who are interested directly or indirectly with motor cars to need very much in the way of explanation. It means that the car always is in the pink of condition; practically all the driver has to do is to drive, all there is to watch is the road ahead. The thoroughness of the inspection and the frequency with which it is made eliminates all work save that which is occasioned by a puncture or a possible more serious rupture of some part of the mechanism which arises from some unavoidable accident.

From the trade standpoint, however, the real consideration is what the service means to the dealer. In inelegant vernacular, it suggests the question, "Where does he get off?" which question is best answered by the fact that the Schwartz people are exploiting their service system to the furthermost degree. That it should attract trade and hold it, once it is secured, is logical, for after the consummation of a sale the service is so complete that each buyer of necessity becomes a "booster" in a double meaning. In the first place, so little trouble is experienced with the car that the brand is boosted; secondly, in appreciation of the service, the establishment is boosted. And if a car owner is kept satisfied with his first car, and with the dealer's methods of handling his trade, both the dealer and the brand receive the first consideration when the purchase of a new car is being contemplated.

That the system also opens avenues for the exploitation of a very great many accessories and for the sale of gasolene and oil is readily apparent, and it would seem that extra profits accruing from such sales should go far toward paying for the services rendered.

Tool for Clearing Cuts in Tire.

Even if a cut in a tire cannot be mended immediately, it will be to its advantage to scrape it out, keeping it clear of bits of gravel and the like that may tend to spread it. An excellent tool for the purpose can be made by flattening the end of a piece of quarter-inch steel wire to a spear-like point and turning it over at right angles, making a scraper that will penetrate to the bottom of a cut. Such a tool is useful for cleaning cuts previous to filling, as well as helping to prevent their spreading until the repair can be made.

LIGHTS GLOW AMID VINES AT PITTSBURGH'S "EXPO"

Show Is First of Two Rival Exhibitions Held in "Smoky City"—Car, Truck and Accessory Exhibitors Total 102.

Exposition Hall—the one in Pittsburgh, Pa.—is aglow with the many lights and bedecked with the vine-entwined trellis work, not to mention the mural paintings that obscure bare walls, all of which go to make an attractive decorative setting for an automobile show. The show now in progress—which is the third "Expo" show, as the Smoky City men call it, and which is managed by T. I. Cochran—is the first of Pittsburgh's rival shows and will be in progress until Saturday evening next, March 8th, the doors having swung wide on Monday evening last, 3rd inst. Both pleasure cars and commercial vehicles are on view, the former to the number of 25, and an even score of the latter shown by 35 dealers. Accessories are more than ordinarily numerous, and are shown by 42 dealers.

Four pleasure cars not previously exhibited during the present show season cropped out. They are the Enger, shown by Aupke Bros.; the Duquesne, by the Aaron Deroy Motor Car Co.; the G. J. G., by Martin & Coulter, and the Alpena, displayed by the Penn Motor Co. The commercial vehicle display likewise brought to light four vehicles not previously shown. They are the E. P. E. electric, which is the product of the Elwell Parker Electric Co.; the Lange, offered by the Lange Motor Car Co.; the Shelton, shown by Martin & Coulter, and the Curtis, made by the Pittsburgh Machine Tool Co.

The cars shown are: Alco, Abbott-Detroit, Enger, Regal, Cole, Studebaker, Duquesne, Stutz, Henderson, Knox, American, Kline, Locomobile, Staver, G. J. G., Michigan, Haynes, Pierce-Arrow, Hupmobile, National, Paige, Ohio, Alpena, Marathon, Pullman, Marion, Schacht, Mitchell, Empire.

The commercial vehicles on view are: Alco, Stewart, Indiana, Little Giant, Studebaker, B. A. Gramm, Bessemer, E. P. E. Co., Knox, I-H-C, Lange, Locomobile, Dart, Shelton, Pierce-Arrow, Hupmobile, Ohio, Curtis, Schacht, Lippard-Stewart, Vulcan, Service, Kelly, Chase.

Thirty-one Cars at Bridgeport's Show.

"Dressed up" for the occasion, the Park City skating rink, which is in Bridgeport, Conn., forms the housing for the automobile show which was inaugurated on Monday evening last, March 24th, under the auspices of the Bridgeport Automobile Dealers' Association. The show comprises 31 products of different automobile factories, displayed by 25 dealers. It will be in progress for the remainder of the week. The cars on view are: Studebaker, White, Pope-Hartford, National, Mitchell, Waverley electric, Rauch & Lang electric, Regal, Ford, Little Giant truck, Henderson, Moon, R. C. H., Cadillac, Selden, Pierce-Arrow, Federal truck, Moyer, Oakland, Abbott-Detroit, Chalmers, Gramm truck, Lozier, Paige, Paterson, Krit, G. M. C. truck, Franklin, Buick.

Trucks that Formed Cinci's Part II.

Saturday evening last, March 1st, saw the close of Part I of the motor show which was staged in the Cincinnati Music Hall by the Cincinnati Automobile Dealers' Association from Monday, 24th ult., until last evening, Wednesday, March 5th. When the doors opened on Monday evening last, in place of the pleasure cars which had held forth during the week previous, were disclosed some 22 makes of commercial vehicles, both large and small, shown by an even score of dealers. They were as follows: Packard, Federal, Pope-Hartford, United States, Pierce-Arrow, Avery, International, Armleder, Schacht, Peerless, White, Lippard-Stewart, Empire, Smith-Milwaukee, Alco, Reo, Service, Detroit electric, Universal, Indiana, Kelley, Glow electric.

Full Score of Cars at Topeka's Show.

Topeka, Kan., has successfully brought to a close its first annual show. The opening occurred Monday evening, 24th ult., in the Topeka Auditorium, under the auspices of the Topeka Motor Car Dealers' Association, and the exhibit held the boards for the remainder of the week. Two dozen different makes of motor cars were in evidence, displayed by 16 dealers; accessories were shown by half a dozen of those who deal in motor car appurtenances. The cars on view were: Chalmers, Cadillac, Hudson, Stafford, Stoddard-Dayton, Oakland, Buick, Interstate, Paige-Detroit, Overland, Mitchell, Cole, Hupmobile, Jackson, Rambler, Auburn, Studebaker, Maxwell, Ford, Glide, Reo, Marion, International and Detroit electric.

Cork that Assists Polishing Jobs.

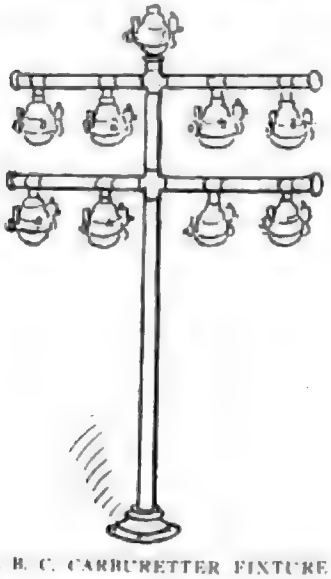
A large cork with its end dipped first in oil and then in emery makes a first-class polisher for metal surfaces that have been filed up smooth. Various grades of emery can be used to bring the surface down to the required finish, but a thin slice should be cut off the cork after using a coarse grade so that there will be no coarse particles sticking in the surface to spoil the work of the finer powder.

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CLIMBING TO SUCCESS ON ACCESSORY FIXTURES

Value of Placing Wares Where They May Be Seen to Best Advantage—Only Slight Expenditure Often Makes Manifold Return Possible—Story of "The Man Who Stood Still."

Whenever a man goes to the theater it is nearly always with the idea of being amused; problem plays are strenuously avoided by that individual whose object in expeditions of this sort is mental recreation, but, despite the attempt to amuse the "tired business man," now and then a play teaches a lesson which, however, is not always recognized in the cover of hilarity or pathos which prevails; many may not recognize it until it is brought to their attention that when Louis Mann portrayed "The Man Who Stood Still" some time ago his role carried a message which is doubly applicable to the accessory trade because, while it has progressed, it has not reached that plane of merchandizing which is attained,

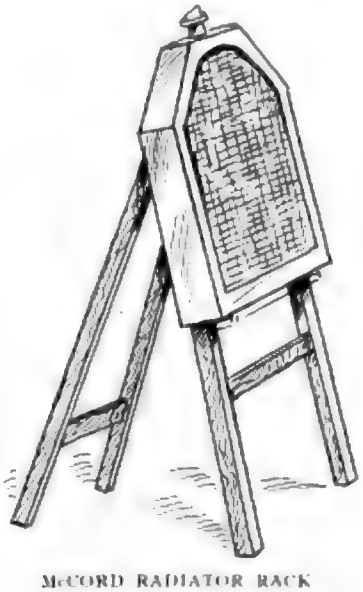


A. B. C. CARBURETTER FIXTURE

generally, only after years of experience on the part of tradesmen.

Whether it really is because the accessory trade is a young trade or whether it is because so many accessory dealers are new in the merchandizing field, is a matter which may be set down as extraneous, so far as the present matter is concerned, but certain it is that with some accessory dealers progressing rapidly there are others who align only too closely with "The Man Who Stood Still."

There is one difference between the two, however, in that while "The Man Who Stood Still" was a past generation product who was unable to awaken to the necessities of the newer sort of salesmanship the accessory man is of the present generation, but he nevertheless is in need of assistance or an awakening in many particulars and, once given the slightest impetus in the right direction, has an unbounded field of endeavor before him. "The Man Who Stood Still" was a jeweler, and in other days the Man had been possessed of an ex-



McCORD RADIATOR RACK

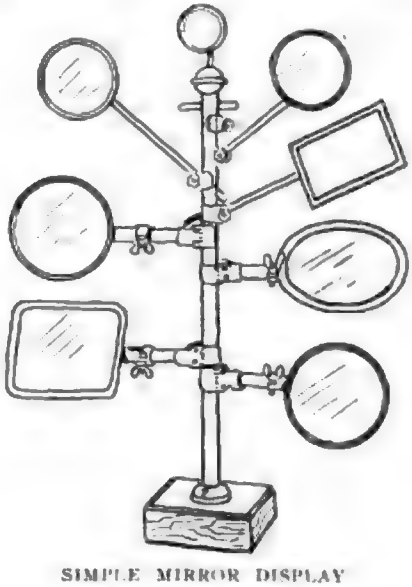
cellent trade, but as the years rolled by it drifted to other more up-to-date shops.

Making a Radiator Attractive.

If "The Man Who Stood Still" could wander along almost any "Automobile Row" and visit a few stores where automobile adjuncts are sold and could view things through his old-time eyes, he would marvel at many things, and he probably would stop in a store where McCord radiators are sold and, in dismay at such useless expenditure of effort, say, "Why such foolishness as to build a stand just to set that radiator on? Wasn't there room on the floor for the radiator?" And the Man never would be able to comprehend the statement that the radiator looks better on a neat rack than it does on the floor and that a great many other fixtures and display devices which he would see would be valuable to him if he were running an accessory store to-day.

The rack in question is much like an easel, designed to hold a picture, and its construction is simple and inexpensive, but the difference it makes in the appearance of the radiator cannot be estimated. A radiator standing on a store floor might look much as if one of the clerks had started to put it somewhere and set it down to wait on a customer, but on the rack it possesses more character and can be more easily inspected by a prospective purchaser. Many other accessories are almost within the hardware class, but may be effectively shown up with proper mounting.

Carburetters are not handsome pieces of work, but the International Accessories Mfg. Co., of New York City, is responsible

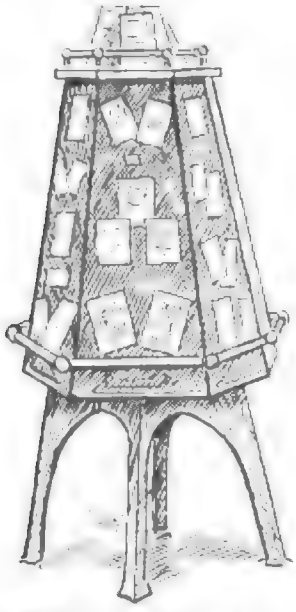


SIMPLE MIRROR DISPLAY

for an attractive method of featuring its A. B. C. carburetters, utilizing a device which is not extremely difficult of manufacture; it consists of several sections of brass tubing, with joints, fitted to form a cross with two cross pieces, while evenly spaced on each side of the upright standard are T-fittings inserted in the cross arm and means for attachment of the carburetters. The carburetters and T-fittings are connected by close nipples and the instruments are much more attractive than when heaped on a counter. As an accompanying illustration shows, this device may be used to advantage for the display of different types or makes of carburetters.

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Possessing considerable attractiveness in themselves, mirrorscopes, like a great many other wares, might be said to be on display when piled up in a showcase, but their value is made more plain to the prospective



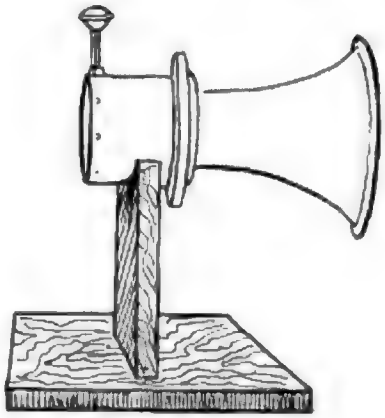
GOODRICH REVOLVING STAND

buyer when the glittering glass affairs are attached to arms of some sort, much as they are mounted when in service on a car, and when a group of these pretty little accessories is displayed on a polished brass standard the effect is striking and merits attention, if for no other reason, because a mirror is seldom passed up by the average human being. An excellent method of mounting, as is illustrated, is upon a single upright tube, inserted in a wood block base, and possessing simple means of attachment.

Mounting Windshields and Bumpers.

Probably as much ingenuity as is required in devising a means of showing off any ware is needed in fitting up a device which will afford a display for windshields and also for bumpers without the result being an angular and unsightly aggregation of rods and bars in which there is no semblance of beauty but in which the effect is such as to repell rather than attract; ingenious mechanics in the employ of various concerns, however, have applied their ability to advantage, and a common means of mounting bumpers is to arrange a number of them on two upright tubular standards, which is well enough but which is not capable of the effect produced by a design worked out by the Cox Brass Mfg. Co., of Albany, N. Y., wherein windshields and bumpers are combined advantageously. The base, as an accompanying illustration makes plain, consists of four legs and a rod connecting them, while above the base windshields and bumpers are arranged alternately.

This last described device necessarily involves considerable labor, which, however, is not wasted effort, yet many an accessory dealer might decry this extensive venture into the fixture field because of its complicated nature; but that he need not be without fixtures is almost certainly indicated by numerous horn mounting standards which place an alarm sounding mechanism in a position much more realistic than mere repose on a showcase cover, and while the majority consists of some form of wooden standard, some with iron mounting arms, the acme of simplicity in the whole fixture line is found in a product which originated with the makers of Long



SIMPLE LONG HORN BRACKET

horns. A glance at the accompanying illustration is better than any description, for the fixture is nothing more than an upright board with hollowed end and fixed to a square base, yet the effectiveness is greatly in excess of the ease of construction.

Enhancing the Value of Literature.

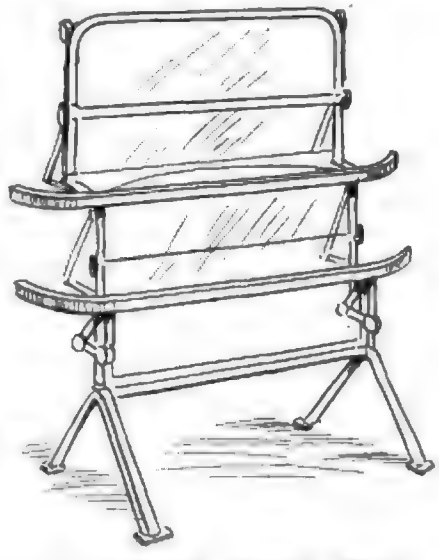
"The Man Who Stood Still" would have marveled at all this expenditure of effort and money which he would have said might better be turned into other directions, and he probably would have been utterly dumbfounded when he saw the B. F. Goodrich Co. pouring good coin into the building of revolving octagonal display fixtures for advertising literature; to start off with, he probably could not comprehend the use of so much expensive literature and that a man should go to so much trouble to build something to hold it when it could just as well be piled up on a showcase would be beyond him. Incidentally, the Goodrich people employ the same stand for displaying their varied line of tire accessories—patches, inner sleeves, and the like.

But the advantage of such a piece of machinery in an accessory store, or any other store, for that matter, when a varying line of wares is sold, is only too apparent; every dealer, it is assumed, is anxious to get his literature into the hands of his trade, and booklets and folders, piled up on a counter, are not always attractive—they look too much like "advertising," which for some unknown reason is something many individuals seek to avoid. But in the fixture in question each piece of literature is shown by itself and in attractive form; the device consists of an eight-sided truncated pyramid so set upon a base that the pyramid will revolve, while neat brass hand rails at the top and bottom serve both as an ornament and a means of turning.

How a Fixture May Pay Heavily.

Anyone knows that the natural impulse when a man sees such an affair is to take hold of the handle and turn the thing, just as visitors at automobile shows always give mounted wheels a whirl and poke every other device which looks as if it were made to be poked, and the man who turns the literature pyramid cannot fail to look at what is on it; in fact, having turned the pyramid he sort of feels that he must excuse his act by looking at the booklets, and if the booklets are properly gotten up he may take one, and if they contain good sales talk he may read it, and if he reads it it may be the stepping stone to a sale. And if because of the booklet one man buys a tire, a radiator or some ware on which there is a substantial profit, is not the fixture paid for?

Even with all these apparent advantages, "The Man Who Stood Still" never could "see the use of it." It looks like putting



COX COMBINED DISPLAY STAND

money into a hole with a chance that it never will come out. What did the Man do? Oh, he came out all right. Of course, he lost his business, but his son-in-law gave him a job, so he managed to get along quite well after all.

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ENGINEERS TALK KEROSENE BUT LET IN LITTLE LIGHT

Fear of Telling "State Secrets" Curtails Carburetter Talk at S. A. E. Metropolitan Section Meeting —Conclusions Reached.

Although it was hoped, in view of the increasing importance of the subject, that much of an enlightening nature would be forthcoming at the monthly meeting of the Metropolitan Section of the Society of Automobile Engineers, held Thursday last, 27th inst., at the headquarters of the society in New York City, in the discussion of an advertised paper entitled "Kerosene Carburetters for Motor Car Use," the meeting was, to those who went prepared for enlightenment, a disappointment, to say the least. As it transpired, the paper was no paper at all, the pseudo title serving merely as a subject for discussion, and the discussion itself was of a rambling nature which consisted essentially of the exploitation of a single device more suitable for heavy stationary engines than for automobile motors.

Despite this fact, however, a few rays of light crept into the smoke-surcharged atmosphere of the meeting room, and some of the considerations of A. C. Bennett, of the Wilcox-Bennett Carburetter Co., who did most of the talking, with regard to vaporization and the admixture of fuel and air contents, were interesting. All told, some 97 manufacturers of carburetters—kerosene and gasolene—had been invited to attend the meeting, but though a number of them were represented, the representatives were singularly adverse to taking part in the discussion, most of them requesting to be excused on the plea that they had attended to listen and learn and not to talk.

Taking exception to the generally accepted theory that to increase the size of the intake manifold and valves, within certain limits, is to increase efficiency, Bennett's most startling dissidence was to the effect that the size of such parts might better be decreased instead of increased, the theory being in line with his own opinion and experience that too little attention is paid to the pulverization of kerosene fuel in the design of a successful heavy fuel carburetter.

Vaporization, he pointed out, is unsatisfactory because of the heat needed and the consequent loss of efficiency through loss of expansion on explosion and the most logical means of attacking the problem is through careful pulverization of the fuel. In his opinion, the only feasible way to employ kerosene is to break it up; the more finely it is broken, the better will be the results.

Hence, Bennett advocates intake passages of the minimum diameter in order to take advantage of the disrupting influence of the air under high velocity, the effect being heightened by holding the intake valve closed until the piston has descended approximately 25 degrees, thus causing a partial vacuum which assists rapid flow of the gases. Incidentally, Bennett opines that the use of intakes as free as possible of short bends is a mistaken idea on the theory that the abrupt change in direction of the mixture tends towards homogeneity. The latter consideration would seem to be borne out by the experience of a British carburetter manufacturer who has obtained noted success with the use of a T-shaped manifold of comparatively small area; gasolene is employed, however.

Despite his considerations against the use of heat, Bennett does use it, though not in the generally accepted manner. Instead of heating either the mixture or the air, Bennett heats the kerosene itself, the heating apparatus taking the form of an exhaust gas jacket around the bowl of the carburetter; gasolene must be used for starting, of course. Also, to obviate knocking, which in his opinion is caused by the expansion and sticking of the upper end of the pistons, he injects small quantities of water into the mixture. It has been found that the smaller the quantity of water employed the higher is the efficiency of the engine.

Another interesting characteristic brought out by Bennett in the course of his talk was that with the use of heavier gravity fuels there is difficulty in ensuring equal charges in the several cylinders of a multi-cylinder engine. To obviate this difficulty it has been the practice of his company to place small fins in the intake passage.

In discussing Bennett's talk, one engineer delved into a not altogether unknown line of thought by suggesting a solution of the problem by mixing kerosene and gasolene. The idea, however, was not heralded with enthusiasm, the majority opposing it.

It was the general concensus of opinion of those in attendance, as expressed by Chairman Anglada, that the most logical and most proper manner of attacking the kerosene carburation problem is for the engine makers and those who make carburetters to work hand in glove, or, in other words, to make engines and carburetters "fit" each other, rather than attempt the designing of a kerosene carburetter that presumably will work successfully on any engine. That there are a great many carburetter makers vitally interested in the perfection of a device that will handle kerosene was manifest by the attendance, and it could only have been their unwillingness to make known exactly what they are doing that prevented many of those present taking advantage of the opportunity afforded by the meeting for a mutually advantageous exchange of ideas.

Ray Harroun Goes into Carburetters.

Ray Harroun, famous as a racing man and of undoubted ability as an inventor and engineer, who in January last formed the Harroun Carburetter Co., capitalized at $50,000, has acquired manufacturing facilities in the Industrial Building in Indianapolis, and matters have progressed to a point where the Harroun carburetter has been adopted as stock equipment for Marmon cars. The device, which is designed specially for the heavier grades of fuel, employs a single jet and the conventional air valve, the distinctive feature being the method of leading heated air from the exhaust first through a jacket around the carburetter and then through the carburetter, the effect being to assist vaporization of the fuel. It is otherwise distinctive by reason of its fine finish, which is described as being equal to that of a "fine watch." A single adjustment, to be made from the dash, is provided.

Electric System Put to Stopping Test.

No one likes to think of operating a piece of machinery brutally, continually, without any rest and at its top capacity for work, but that is exactly what the Apple Electric Co., of Dayton, Ohio, did a few days ago, and the demonstration served to bring to light that long charging periods are not particularly necessary with the Aplco system. An Inter-State stock car, equipped with the Aplco electric lighting and engine starting system, was used, and the car was stopped in front of every numbered business house in the downtown section and started again immediately—for just 3 hours and 45 minutes. Approximately 1,200 starts were made, the average figuring out at something like six a minute. Despite the frequent starts and the short space of time allowed for recharging the battery, the dynamo proved itself more than equal to the emergency, for it actually put back into the battery more "juice" than the starter drew out of it in the demonstration.

Acetic Acid for Cleaning Spark Plugs.

Better than the use of gasolene for the removal of carbon from the insulating media of spark plugs is a ten per cent. solution of acetic acid. Applied with a stiff brush, this solution will quickly remove the formation, after which the core should be placed in alcohol before being inserted in the shell to the elimination of the last trace of moisture. In the absence of acetic acid, it should be remembered that it is practically vinegar in diluted form.

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McCLELLAND BILL MENACES AUTOMOBILE INTERESTS

(Continued from page 15.)

or badge belonging to another person, or a fictitious license or badge.

"No person shall operate or drive a motor vehicle upon the public highways of this state, after the first day of January, 1914, unless such person shall have complied with the requirements of this section; provided, however, that a non-resident chauffeur or owner, who has been licensed or registered under the provisions of law of the foreign country, state, territory or federal district of his residence, substantially equivalent to the provisions of this article, shall be exempt from license under this section; and provided, further, that any member of the owner's immediate family, not under eighteen years of age, may obtain a license to operate a motor vehicle upon the highways of this state, if the owner shall stipulate upon the application for such license that such person is thereby constituted his duly authorized agent to operate such owner's car. No person shall allow a motor vehicle owned by him or under his control to be operated by any person who has no legal right to do so or in violation of any of the provisions of this article.

"Every owner of a motor vehicle registered under the provisions of this article, who shall engage any person to operate a motor vehicle as a chauffeur, shall cause to be filed with the secretary of state the name of such chauffeur, his address and license number together with a certificate of character of said chaunffeur."

Chauffeur's "Character" Must Be Filed.

In addition to reporting the sale of his car to the secretary of state, as at present, the McClelland bill also would require any owner employing a chauffeur to file with the same official a certificate giving the name of any chauffeur he may employ, and not merely such chauffeur's address and license number but "a certificate of character of said chauffeur."

The present provision applying to the speed of motor vehicles has been almost entirely rewritten. If the McClelland act is incorporated, not even cities of the first class can fix their own speed limits, nor will any city or village be required to display signs as at present. Neither will they be required to file copies of their local ordinances with the secretary of state, as is now the case. Instead of being required to drive "in a careful and prudent manner," and instead of a rate of speed of 30 miles an hour for a distance of a quarter of a mile being presumptive of careless or imprudent driving, Senator McClelland makes 25 miles an hour for a distance of an eighth of a mile the extreme limit of speed on open highways, 15 miles being the limit in built-up sections. He would also require that the speed of motor vehicles passing a street car that is "stationary or about to stop" shall be reduced to five miles an hour. The full clause is as follows:

How the Speed Law Is Renovated.

"No person shall operate a motor vehicle on the highways of this state recklessly or at a rate of speed greater than is reasonable and proper, having regard for the width, traffic and use of the highway, or so as to endanger the property or the life and limb of any person; provided, that if the rate of speed, within the limits of a closely built-up territory of a city, village or town, contiguous to a public highway, where for not less than one-quarter of a mile the dwelling-houses on such highway average less than 100 feet apart, exceeds 15 miles per hour for a distance of one-quarter of a mile, such rate of speed shall be prima facie evidence that the person operating such motor vehicle is operating the same at a rate of speed greater than is reasonable and proper, and in violation of the provisions of this section; provided further, that if the rate of speed without the limits above named exceeds 25 miles an hour for a distance of one-eighth of a mile, such rate of speed shall be prima facie evidence that the person operating such motor vehicle is operating the same at a rate of speed greater than is reasonable and proper, and in violation of the provisions of this section; provided further, that if the rate of speed of a motor vehicle operated on the public highways of this State where the operator's view of the road and traffic is obstructed, when approaching a crossing or intersecting public highway, or when traversing a bridge or a sharp turn or a steep ascent or a curve in the highway, exceeds ten miles an hour such rate of speed shall be prima facie evidence that the person operating such motor vehicle is operating the same at a rate of speed greater than is reasonable and proper, and in violation of the provisions of this section; provided further, that if the rate of speed of a motor vehicle in passing any street railway car that is stationary or about to stop, on the same side of the car on which passengers are ordinarily received and discharged, exceeds five miles an hour, such rate of speed shall be prima facie evidence that the person operating such motor vehicle is operating the same at a rate of speed greater than is reasonable and proper, and in violation of this section."

Cut-Outs, Noise and Smoke Forbidden.

Among the few praiseworthy features of the McClelland act are provisions prohibiting unnecessary noise and forbidding not only the use of harsh or objectionable signalling devices, but cut-outs and also the emission of an "unreasonable amount of smoke."

As might be expected, the McClelland bill provides for an increase in the penalties for violations. Infringement of any of the provisions pertaining to registration, licensing, signalling and speed are made punishable by a fine of not more than $100 or imprisonment for 10 days, or both, for a first offense, and a fine of not more than $500 or imprisonment for six months, or both, for any subsequent offense. At present, the violations of these sections are punishable by fines not exceeding $50, imprisonment not being permitted.

Fine and Jail for "Boozy" Drivers.

Operating a motor vehicle while under the influence of liquor or drugs, or upon a wager or in a race, will entail a fine of not more than $200 or six months' imprisonment, or both, for the first offense, or not more than $500 or imprisonment for one year, or both, for any subsequent offense. The drunk who is arrested the second time, without option on the part of the court, will be imprisoned not less than six months and not more than two years.

Any person concerned in an accident who goes away without stopping and making himself known will be fined $100 for the first offense and $250 for a subsequent offense.

$100 or 30 Days for "Crossing" Police.

Any motorist who refuses to give his name and address to any officer, or to exhibit his license or registration certificate, or who refuses practically any other request made by police officials, will be fined not more than $100 or imprisoned for 30 days, or both.

Any person operating an unregistered motor vehicle will be punished by a fine of $500 or imprisonment for not more than one year, or both.

For violation of any other provision of the law the fine limit is $100 and the imprisonment limit 30 days.

License Revoking Pastime for Secretary.

The McClelland bill authorizes the secretary of state to suspend or revoke licenses practically whenever he feels like it, and requires him to suspend them whenever the operator of a car is involved in an accident resulting in the death of any person. In such cases, the operator's license will not be renewed within one year after the date of its revocation, unless he happens to have a pull with the secretary of state, which pull is described as "discretion."

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In the RETAIL WORLD

W. J. Inman and Conrad Prasse have entered the trade in Lena, Ill. They have the Cole agency.

Lewis Skinner, formerly of Morrice, Mich., is about to open a garage in Wilmington, N. D.

The G. H. Williams Rubber Co. will open a new supply house in Phoenix, Ariz., at 310 North Central avenue.

J. P. Maguire has opened a repair and service station in Springfield, Ill. It is at 130 West Carpenter street.

O. E. Olson has bought the Pekin Auto Co., of Pekin, N. D., of Oscar Price; Olson will operate the company alone.

Roy Carnright contemplates the erection of a garage in Newburgh, N. Y. The site considered is on Du Boist street.

The Adirondack Motor Co., of Albany, N. Y., is about to erect a new garage on Central avenue; W. R. Rose is manager.

Frank W. Downs has opened a garage in Bettendorf, Ia. His business will include an agency and a garage and taxicab service.

The Coleman & Bentel Co., of Los Angeles, Cal., has changed its name to Bentel & Mackey Co. A new building will be erected.

Frank Mackinson has purchased a half-interest in the Sigley (Ia.) Auto Co. The company handles Paige-Detroit and Chalmers cars.

Harry B. Hartley has opened a tire and supply house in Boston, Mass., at 243 Columbus avenue. The style is Automobile Tire & Supply Co.

S. C. Fowler has sold his interest in Ye Auto Shop, in Jacksonville, Fla., to C. W. Fawcett. C. R. Rowlson, Fowler's former partner, remains in the firm.

Samuel Ullman has purchased Gabriel Heineman's garage in Antigo, Wis. To place it in a more advantageous location it was moved by means of sleighs.

The Decorah Auto Car Co. has been formed in Ossian, Ia., by C. S. Marshall and others; a location in the M. J. Marsh building has been secured.

New quarters are being erected for the Overland Auto Co., of Phoenix, Ariz. The location is on North Central avenue and the building will be 75 x 137½ feet.

Karl Winter, formerly a mechanic, has branched out for himself in Salt Lake City, Utah. He has opened a repair shop at Eighth, South and State streets.

Charles Ungs has purchased the interest of Grover Bass in the Hawkeye Garage in Dyersville, Ia. Ungs and the other partner, S. G. Durant, will continue the business.

A. A. McLeod, for a number of years with the Pope Mfg. Co., in Hartford, Conn., has entered the garage trade in that city.

SIGNAL DEVICES WELL DISPLAYED



Coughlin & Davis's window arrangement of Klaxon horns in their Cincinnati store.

He has opened the Aetna Garage at 1227-29 Main street.

Charles L. Young, manager of the Young Aeroplane Co., of 304-6 East 15th street, Kansas City, Mo., has "come down to earth"; he has supplemented the company's business with the Pathfinder agency.

Swenson Bros. have purchased a half interest in the garage business of T. A. Austin, in Iola, Wis., and a new garage and repair shop will be erected in the spring. The company represents the Case and Ford lines.

A. I. Thayer & Sons, operators of a garage and machine shop in San Rafael, Cal., are enlarging their business; they have purchased the Herzog Garage property at 4th and Cijos streets and will erect thereon a new building for their occupancy.

The General Motors Service & Truck Co., of which W. E. Norris is the proprietor, has leased Miller's Garage, in Bridgeport, Conn., at 554-58 Fairfield avenue, and has changed the name to G. M. C. Garage. The company is dealer in G. M. C. trucks.

B. Four, an accessory dealer in Los Angeles, Cal., has purchased the stock and business of the Pacific Auto & Supply Co., of San Diego, in the same State, which recently went into bankruptcy. Four will continue the business under the old name.

Trevor & Snider have just completed a $35,000 garage, containing 9,000 square feet of floor, on Third avenue, between 20th and 21st streets, Rock Island, Ill. The firm has the agency for Stearns-Knight, Cole and Chicago Electric cars. The firm members are Alexander W. Trevor and Walter E. Snider.

Two Philadelphia (Pa.) companies, the M-S-M Sales & Rubber Co., of 669 North Broad street, and the Meeley Tire House, of 1335 Mount Vernon street, and with branches in Washington, D. C., have been merged. The new company is styled Meeley Rubber Co. and is located at 600 North Broad street.

Anderson, Ltd., recently incorporated in Toronto, Ont., has secured salesrooms and a service station at 559½ Yonge street, recently occupied by the Diamond Tire Co., and is handling Reo cars; the manager and secretary of the company, Frank G. Anderson, has been in the trade for some time, having been connected with the Royal Oil Co.

A. C. Brady and A. T. Murray, both formerly connected with the factory of the International Motor Co., at Allentown, Pa., have formed the Brady-Murray Motors Co. in New York City; they have arranged to represent the new Chandler Motor Car Co. in New York City, Long Island and a part of New Jersey. A location on Broadway will be secured.

Fred Riley, C. B. Morse and Burke Bowes have formed the United Motors Co. in Battle Creek, Mich. They have secured a location on River street and will handle Reo, Little, Everitt and Michigan cars and operate a garage. Their building has a storage capacity of 300 cars. Before the formation of the new company Riley was R. C. H. dealer, Bowes sold Everitts and Morse was

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Des Moines (Ia.) manager for the M. Rumely Co.

The Simplex Automobile Sales Co., of St. Louis, Mo., has reincorporated as The Motors Corporation. The officers are: President, Wooster Lambert; vice-president, Drummond Jones; secretary and treasurer, Knox Taussig; manager, H. H. K. Schwerdtmann; directors, the above and E. A. Faust. Headquarters are retained at 3214 Locust street and Simplex, King and Garford cars are stocked, the latter being a recent addition.

The Studebaker Corporation, which heretofore has maintained a branch for the transaction of wholesale and retail business in Seattle, Wash., has transferred the retail end to Frank Waterhouse & Co., Inc., who also are dealers in Garford trucks. The Studebaker wholesale business in that territory will continue to be handled by the branch. The Waterhouse company has opened a new garage and salesrooms at Broadway and Pike street.

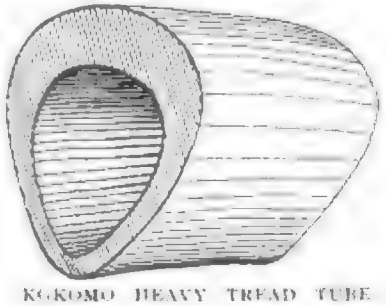
Frank G. Carrie, who has been connected with the trade for nearly a decade, has purchased an interest in the Cutting-Larson Co., Oldsmobile dealer in New York City. Charles H. Larson, of the latter company, and Carrie have been personal friends for years. Some of Carrie's principal trade connections have been manager of the Haynes New York branch, with Wyckoff, Church & Partridge, manager of the Rainier New York branch and, lately, manager of the Marquette (Mich.) branch for the General Motors Co.

The Oakland-Wisconsin Motor Co., of Milwaukee, heretofore distributer in that State of Oakland, Detroiter and Empire cars, has been reorganized and incorporated with a capital stock of $50,000; also its territory has been augmented by the addition of Upper Michigan. The officers of the new company are: President and general manager, R. A. Creek; vice-president, Allen H. Small; secretary and treasurer, N. M. Creek. Headquarters will continue temporarily at 228-32 Wisconsin street, but a $50,000 garage is being erected at another location.

The Standard Auto Co. has been formed in Louisville, Ky., by George Dunham, formerly of the Dunham Auto Co., and C. L. Anderson, for several years manager of the Miles Auto Co., both of that city; the new company has taken over the old Dunham salesrooms and garage at 212 East Broadway and will improve the premises. Anderson will act as manager and J. A. Dugan, until recently with the Louisville Oldsmobile branch, will be sales manager. Cole and Regal cars and Woods electrics will be distributed. The Cole Motor Co., State distributer of Coles, has taken offices with the Standard company and E. H. Chase, former manager of the local Oldsmobile branch, will act as manager, with Dr. W. F. Blackford as his assistant. The latter formerly was head of the Southern Motor Sales Co. L. L. Miles, formerly of the Miles Auto Co., who recently withdrew from the trade, has returned as president of the Southern Motor company, which recently took over the Miles company and will handle Packards, Hudsons and Detroit Electrics.

Kokomo Brings Out a Heavy Tread Tube.

It is an engineering rule that the materials composing any structure should be placed under the least possible initial stress, or stress that is not due to work performed or load carried. The inner tube shown in the accompanying illustration is built according to this principle; it is moulded in the shape in which it will be used, so that



KOKOMO HEAVY TREAD TUBE

when in position in the shoe and inflated the initial stress will be low because the tube does not have to be forced into a shape differing from its normal form.

The new tube is manufactured by the Kokomo Rubber Co., of Kokomo, Ind., an old and reputable concern that is known for the excellence of the goods it has turned out. Like the shoe, the Kokomo heavy tread tube, as it is styled, is made heaviest where the work is heaviest—at the tread; the illustration shows clearly the generous increase in thickness of the rubber at this point. It is claimed that liability to puncture is considerably decreased not only on account of the depth of rubber to be penetrated before air can escape, but also because the tread is not stretched, thus avoiding the tendency to open up punctures, while in case of puncture, the thick tube has a degree of self-healing qualities. Pinching, it is further stated, is eliminated, because there are no loose folds of rubber to catch and make trouble.

Recent Losses by Fire.

Rehobeth, Del.—L. J. Carmine, garage damaged. Loss not given.

Pittsburgh, Pa.—Vanadium Co., Forbes street, garage damaged. Loss, $7,400.

Omaha, Neb.—Metz Garage, garage damaged and several cars destroyed. Loss, $6,000.

Sioux City, Ia.—Pioneer Motor Co., Douglas street, repair shops damaged. Loss, $15,000.

Natchez, Miss.—Jules W. Wexler, dealer, garage damaged and several cars destroyed. Loss, $2,464.

Fall River, Mass.—Charles Belcher, Bayles street, garage and twelve cars destroyed. Loss, $10,000.

St. Louis, Mo.—William E. Bowman, West End Garage, 5018 Page boulevard, damaged. Loss not given.

Buffalo, N. Y.—Jacob Steinman, 110 Grant street, garage damaged and several cars destroyed. Loss, $8,000.

Hickman Mills, Mo.—Kansas City Automobile Club's clubhouse, 14 miles south of Kansas City, destroyed. Loss not given.

Minneapolis, Minn.—Motor Car & Equipment Co., F. R. Corcoran, proprietor, 206-10 Washington avenue, north, garage, 13 cars and accessories stock damaged. Loss, $10,000.

Renault Agency Drops the "Freres."

Although one of the Renault brothers, who were the builders of that car in France, died some time ago, the selling agency in New York City has continued until this week to be known as the Renault Freres Branch, but the Supreme Court for New York county this week authorized the changing of the name to Renault Selling Branch, the "Freres" being dropped. Also the sales end of the business has been removed from 1890 Broadway to 719 Fifth avenue; the garage and service department, however, will be continued at 214 West 65th street.

Paid Slow Account, Must Now Pay Costs.

Failure on the part of the Mexico Motor Car & Supply Co., of Mexico, N. Y., to pay an account to the Thermoid Rubber Co., of Trenton, N. J., when due resulted in a suit the outcome of which is that the supply company not only has had to pay the bill but must pay $24.41 costs; the bill, itself, has been paid and judgment for the costs was filed this week in the New York county clerk's office.

Federal Rubber Opens up in Cleveland.

The Federal Rubber Mfg. Co., of Milwaukee, Wis., has opened a branch in Cleveland, Ohio, at 1833-35 East 13th street. It is in charge of G. Couturier, who previously was in the service of the Beckley-Rahlston Co., of Chicago, and who also had considerable experience with the Hartford Rubber Works Co., with which he was once identified for about four years.

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The Week's Incorporations

Lansing, Mich.—R. & R. Garage Co., under Michigan laws; authorized capital, $5,000; to operate a garage.

Pineyville, Ky.—Cumberland Motor Co., under Kentucky laws; authorized capital, $50,000; to deal in motor cars.

Wilmington, Del.—Monarch Rim & Tire Co., under Delaware laws; authorized capital, $5,000; to manufacture rims and tires.

Dover, Del.—D. & H. Auto Co., under Delaware laws; authorized capital, $25,000; to deal in motor cars. Corporators—J. M. Deatrich, J. G. Harris, L. Harris.

Columbus, Ohio—Automobile Protective Association Co., under Ohio laws; authorized capital, $5,000. Corporators—William Lester, Mary A. Caputo, R. M. Switzer.

Peru, Ind.—Peru Tire & Rubber Co., under Indiana laws; authorized capital, $25,000; to deal in motor cars. Corporators—C. E. Miller, O. J. Tillett, Ira H. Stanter.

Chicago, Ill.—Bryn Mawr Garage, under Illinois laws; authorized capital, $2,500; to operate a garage. Corporators—George C. Bour, George R. Bennett, Joseph A. Wall.

Detroit, Mich.—Packard Motor Sales Co., under Michigan laws; authorized capital, $10,000, to deal in motor cars. Corporators—Henry B. Joy, Alvan Macauley, Sidney B. Waldon.

Shelbyville, Ky.—Farmers' Supply Co., under Kentucky laws; authorized capital, $5,000; to deal in motor cars. Corporators—L. G. Baskett, A. S. Frazier, J. C. Johnson.

Boston, Mass.—Arco Rubber Co., under Massachusetts laws; authorized capital, $15,000; to deal in rubber goods. Corporators—H. G. Cressinger, F. E. Black, William B. Hill.

San Benito, Cal.—Whittlesey Garage & Machine Co., under California laws; authorized capital, $25,000; to operate a garage and machine shop. Corporators—G. W. Whittlesey, James T. Valentine, J. P. Valentine.

Dover, Del.—Accessories Sales Co., under Delaware laws; authorized capital, $50,000; to deal in motor car accessories. Corporators—C. Heymann, J. R. Howe, Jr., F. A. Linn.

Wheeling, W. Va.—Lavender Auto Supply Co., under West Virginia laws; authorized capital, $25,000; to deal in motor car supplies. Corporators—Annie Kennard and others.

Indianapolis, Ind.—Northern Auto Co., under Indiana laws; authorized capital, $10,000; to deal in motor cars. Corporators—I. J. Clements, R. M. Fleming, L. H. Van Briggle.

Cleveland, Ohio—National Garage Co., under Ohio laws; authorized capital, $20,000; to operate a garage. Corporators—John A. Nally, C. A. Gardner, George L. Williams.

St. Louis, Mo.—Hudson-Phillips Motor Car Co., under Missouri laws; authorized capital, $10,000; to deal in motor cars. Corporators—C. F. Phillips, J. H. Phillips, J. E. Stewart.

Seattle, Wash.—Washington Cartercar Co., under Washington laws; authorized capital, $10,000; to deal in motor cars. Corporators—George C. Jenkins, L. V. Peck and others.

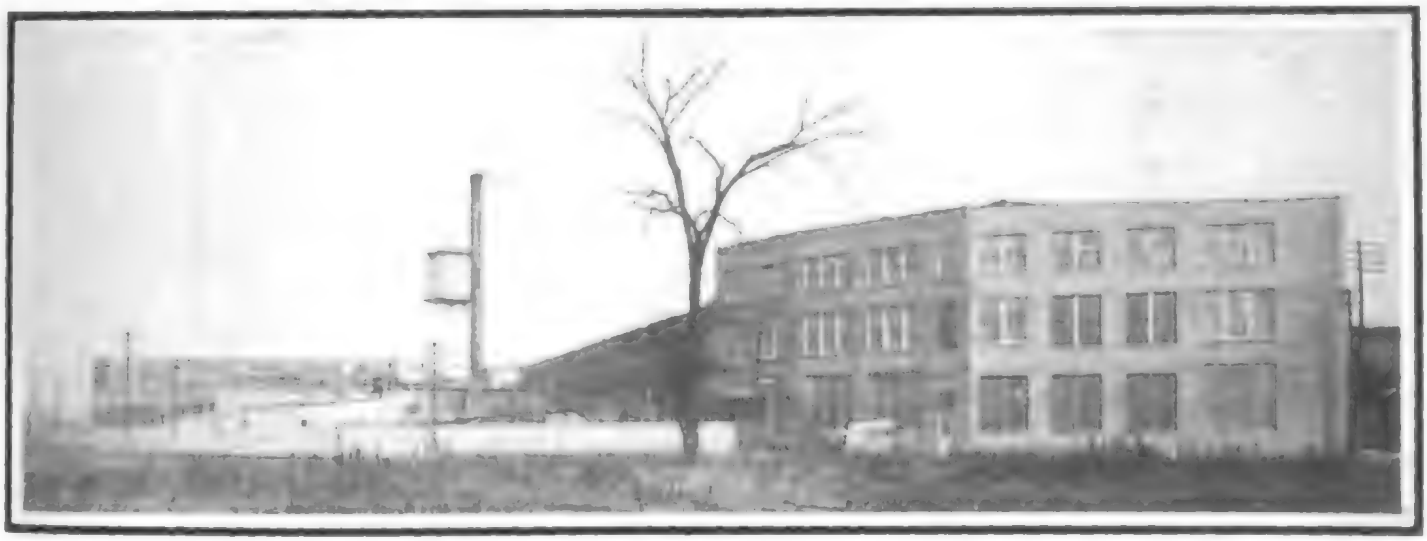
Boston, Mass.—W. C. Bates Co., under Massachusetts laws; authorized capital, $10,000; to deal in motor cars. Corporators—William C. Bates, William J. Munday, Geo. A. Kersley.

El Paso, Tex.—Longwell Auto Truck & Sale Co., under Texas laws; authorized capital, $10,000; to deal in motor vehicles. Corporators—J. J. Longwell, H. M. Andreas, J. A. Tays.

Chicago, Ill.—Logan Square Auto Supply Co., under Illinois laws; authorized capital, $10,000; to deal in motor cars. Corporators—Otto E. Schmidt, August J. Schmidt, Martha Perl.

Chicago, Ill.—Lacy Motor Livery Co., under Illinois laws; authorized capital, $10.

NATIONAL MOTOR VEHICLE CO.'S PLANT IN INDIANAPOLIS, IND., MADE LARGER



This new building, which is three stories in height and is constructed of brick and cement, provides 20,000 additional feet of floor space. It is at the rear of the 22nd street plant and will permit much-needed expansion.

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000; to operate a motor livery. Corporators—Herbert Decker, Franklin H. Lacy, Samuel J. Richman.

Nashville, Tenn.—State Motor Car Co., under Tennessee laws; authorized capital, $25,000; to deal in motor cars.

Bowling Green, Ky.—Century Auto & Garage Co., under Kentucky laws; authorized capital, $15,000; to deal in motor cars and operate a garage.

Rockaway Beach, N. Y.—Seaside Garage, Inc., under New York laws; authorized capital, $500; to operate a garage. Corporators—Patrick H. Morrison, Anthony Hauser, Jennie Morrison.

New Castle, Va.—Craig Transfer & Motor Car Co., under Virginia laws; authorized capital, $5,000; to operate a motor delivery and deal in motor cars. Corporators—J. P Jones and others.

Chicago, Ill.—Rayfield Motor Sales Co. of Illinois, under Illinois laws; authorized capital, $41,000; to deal in motor cars. Corporators—Robert C. Wheeler, Charles L. Cobb, Cecil Barnes.

Philadelphia, Pa.—American Silencer Co., under Delaware laws; authorized capital, $50,000; to manufacture motor car parts. Corporators—F. R. Hansell, George H. B Martin, S. C. Seymour.

Seattle, Wash.—National Automobile Fender Co., under Washington laws; authorized capital, $350,000; to manufacture motor car fenders. Corporators—A. L. Patterson, A. M. Ferguson.

Indianapolis, Ind.—Simplex Appliance Co., under Indiana laws; authorized capital, $10,000; to manufacture motor car appliances. Corporators—William C. Hamilton, W. Lee Bird, Isaac Born.

Worcester, Mass.—Overland - Winton Sales Co., under Massachusetts laws; authorized capital, $10,000; to deal in motor cars. Corporators—George F. Fuller, Harlan T. Pierpont, Jay Clark, Jr.

St. Louis, Mo.—George C. Brinkman Motor Car Co., under Missouri laws; authorized capital, $5,000; to deal in motor cars. Corporators—George C. Brinkman, Phyllus M. Brinkman, Benjamin G. Brinkman.

Hartford, Conn.—Hartford Auto Pump & Supply Co., under Connecticut laws; authorized capital, $50,000; to manufacture motor car supplies. Corporators—H. F. Schrabe, Edward E. Tryon, Thomas Lockwood.

Lockport, N. Y.—Ampere Electric Co. Inc., under New York laws; authorized capital, $25,000; to manufacture motor car devices. Corporators—Theodore B. Robinson, Ernest W. Jones, Charles L. Nichols.

Newcastle, Ind.—Lawter Tractor Co., under Indiana laws; authorized capital, $10,000; to manufacture tractors. Corporators—Benjamin H. Lawter, Orville O. Carpenter, John C. Goodwin, William H. Goodwin.

Toledo, Ohio—Parsons Mfg. Co., under Ohio laws; authorized capital, $10,000; to manufacture motor car parts. Corporators—George E. Seney, Charles W. Parsons, Irving E. Austin, Harry Parsons, H. B. Kier.

Rochester, N. Y.—Central Motor Supply Co., Inc., under New York laws; authorized capital, $20,000; to deal in motor car supplies. Corporators—Percy B. Barager, Robert F. Close, William Hood, 17 Hanna Place.

West Orange, N. J.—Edison Storage Battery Co., under New Jersey laws; authorized capital, $10,000; to manufacture storage batteries. Corporators—Harry F. Miller, William H. Meadowcraft, William G. Boe.

New York, N. Y.—Commercial Lubricating Co., under New York laws; authorized capital, $2,500; to manufacture lubricating devices. Corporators—Agnes R. Mayfield, Louis Preau, John J. Crawford, World Building.

Columbus, Ohio—New Columbus Automobile Co., under Ohio laws; authorized capital, $30,000; to deal in motor cars. Corporators—Jessie J. Brown, Lilliam M. Brown, William E. McConnon, Charles E. Dennis and others.

New York, N. Y.—K. C. Pardee, Inc., under New York laws; authorized capital, $65,000; to deal in motor cars. Corporators—Karl T. Frederick, Chester R. Dewey, 49 Wall street; Leander F. Sniffen, 3411 Fort Independence street.

Brooklyn, N. Y.—Caton Garage, Inc., under New York laws; authorized capital, $10,000; to operate a garage. Corporators—S. O. W. Hoagland, 746 58th street; Frank Lemmer, 95 East 10th street; John Carlson, 944 74th street.

Chicago, Ill.—Stafford Illuminated Auto Lamp & Number Co., under Illinois laws; authorized capital, $50,000; to manufacture motor car accessories. Corporators—Wm. Doran, E. H. Pollard, M. M. Parks, Frederick S. Stafford, F. W. Schaub.

New York, N. Y.—No Shock Wheel Co., under New York laws; authorized capital, $400,000; to manufacture motor car parts. Corporators—J. W. Ebbs, Englewood Cliffs, N. J.; R. H. Waddell, 220 Broadway, New York City; A. A. Kelley, Montclair, N. J.

New York, N. Y.—K-E-W Mfg. Co., under New York laws; authorized capital, $5,000; to manufacture motor car accessories. Corporators—John Jacobs, 663 East 165th street; Warren W. Ward, 15 West 96th street; John A. Bednarik, 508 East 86th street.

Brooklyn, N. Y.—Newkirk Avenue Automobile Co., Inc., under New York laws; authorized capital, $5,000; to deal in motor cars. Corporators—William Backus, 1163 New York avenue; Jennie Hunton, 299 Broadway; W. D. Maxwell, 6907 Ridge Boulevard.

New York, N. Y.—Willets Service Co., Inc., under New York laws; authorized capital, $50,000; to deal in motor vehicles. Corportors—William C. Willets, 106 7th avenue; Marius Jurgensen, 962 72nd street, Brooklyn; Estelle M. Naylor, 4 So. Oxford street, Brooklyn.

New York, N. Y.—Star Taxicab Co., Inc., under New York laws; authorized capital, $2,500; to operate a taxicab service. Corporators—H. T. Silverman, 149 Guernsey street, Brooklyn; Nathan Waxman, 346 Broadway, New York City; James B. Vaughey, 165 East 66th street.

Changes of Capitalization.

Detroit, Mich.—Trio Mfg. Co., from $10,000 to $250,000.

Akron, Ohio—Motor Starting Co., from $25,000 to $50,000.

Ashland, Ohio—Ashland Mfg. Co., from $10,000 to $30,000.

Poughkeepsie, N. Y.—Ryder Motor Co., from $8,500 to $75,000.

Lorain, Ohio—Electric & Automobile Co., from $10,000 to $20,000.

Hartford, Conn.—Universal Auto Co., from $10,000 to $30,000.

East Moline, Ill.—Midland Motor Co., from $100,000 to $300,000.

Lansing, Mich.—W. K. Prudden & Co., from $500,000 to $750,000.

Cleveland, Ohio—Stuyvesant Motor Car Co., from $200,000 to $10,000.

Chicago, Ill.—Automobile Construction Co., from $27,000 to $100,000.

Cleveland, Ohio—Cleveland Auto Livery Co., from $10,000 to $25,000.

Dayton, Ohio—Air Friction Carburetter Co., from $20,000 to $30,000.

Ft. Wayne, Ind.—Wayne Oil Tank & Pump Co., from $200,000 to $250,000.

Bowling Green, Ohio—Bowling Green Motor Car Co., from $100,000 to $200,000.

Toledo, Ohio—Landman-Griffith Motor Co., from $10,000 to $20,000 and name changed to Landman-Griffith-McIntyre Co.

Change of Corporate Name.

Detroit, Mich.—Ehy Auto Parts Co. to Benham Mfg. Co.

Chicago, Ill.—Curtis Motor Truck Co. to Curtis Motor & Forge Co.

Chicago, Ill.—Scientific Auto Tube Co. to Vail-Osgood Rubber Co. and capital from $200,000 to $100,000.

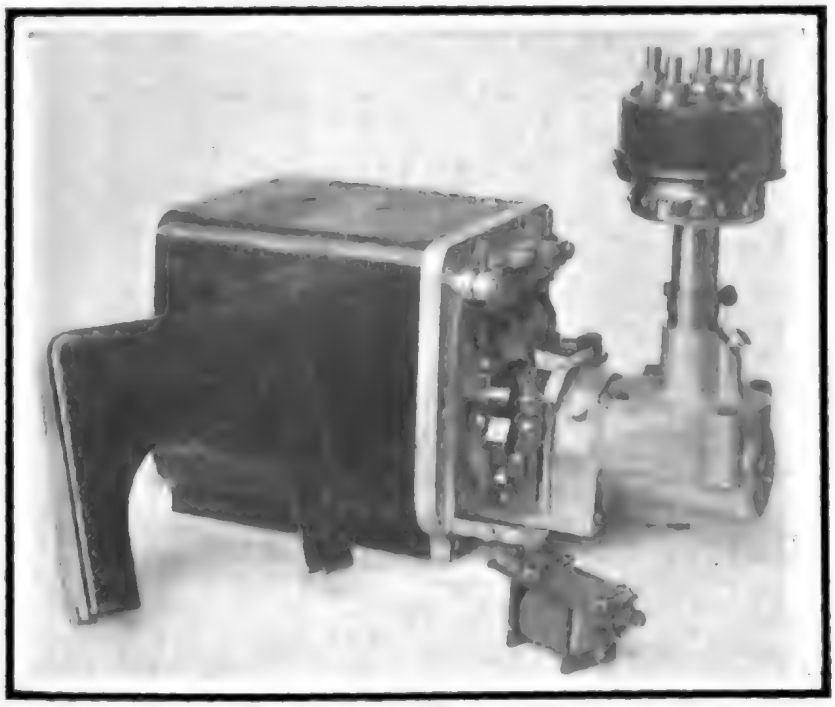
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LETTING IN LIGHT ON ELECTRICAL EQUIPMENT

Dangers That Lurk in "Smut" on the Commutator and Brushes and How They May Be Avoided—Simple Methods of Clearing Away Undesirable Accumulations—Elyria-Dean Lighting and Starting System Dissected.

(This is the twenty-first of a series of articles designed to make clear the electric lighting and engine starting systems in use and to render easier their care and repair by the dealer and owner alike.)

Statisticians have gathered information more or less useful in almost every field of human endeavor—"figures strange and sweet," to paraphrase Coleridge a bit. But has any one ever computed the number of electric lighting and engine starting systems temporarily out of service because of gummed up commutators? It is not likely. In the first place, the systems of themselves are not old enough to have warranted attention and statistics of the kind. In the second place, the trouble is not as prevalent as the preceding sentences might lead one to suppose, though there can be no doubt that if all the troubles that beset the owner were set down in tabular form and traced to their respective roots the amount of trouble emanating from smut on the commutator and brushes in proportion to the troubles caused by other things would surprise more than one person.



ELYRIA-DEAN DYNAMO, SHOWING BRUSHES, CUT-OUT AND TIMER

It is surprising, also, that such a condition of affairs should be permitted to exist, for, of all things about the average lighting and starting system, the brushes and the commutator are by all odds the very parts that the manufacturer makes the most accessible—the most amenable to amateur treatment, so to speak. They are not quite in plain sight, though their location is not hidden. They are covered, as they should be, to protect them from dirt and moisture, in every case, but they are accessible. It is easy to get at them. Their accessibility, in fact, may be taken as an expression of the manufacturer's hope that they will be "gotten at" occasionally.

A knowledge of how to go about the job is needed, of course, but that is easily acquired, as has been pointed out in the preceding twenty articles on the subject that have appeared in Motor World. It is so easy, for instance, to slip the dynamo brushes out of their little sockets every once in so often, provided the appearance of the commutator warrants it, and to apply a cloth dampened with gasolene to its rotating surface, afterward following it up with an application of fine sandpaper to remove scratches. More than a grain of truth is contained in the statement "Even a child can do it." The operation is so simple, so apparent in all its aspects, that the owner making his own repairs and adjustments can do no wrong (damage) and the dealer "fixing up" the owner need have no fear of incurring wrath by bungling the job. It can be done in about 15 minutes on the average equipment.

Take the new Elyria-Dean dynamo for an example—it forms part of the Elyria-Dean lighting and engine starting system produced by the Dean Electric Co. of Elyria, Ohio, and made its initial appearance such a short time ago that it is virtually a newcomer in the field, though it has been in course of construction and perfection for many months. It is possible to get into its commutator in a jiffy and, what is even more to the point, the "getting in" operation reveals also the cut-out mechanism, which is of vital importance, and makes the dynamo inoperative. That is to say, it can be run at any speed for any length of time, without harming itself or any other part of the equipment, including the battery.

Power and Compactness Combined.

In its essential elements, the Elyria-Dean system consists of three units—namely, the dynamo, the starting motor and the battery—and they are quite separate. The dynamo and the starting motor are not combined, as they are in some systems. Both are comparatively small, considering their allotted tasks, and are completely enclosed and waterproof; the battery is rated at 120 ampere hours capacity and consists of three cells, the voltage therefore being six. The starting motor measures six inches by six inches over all, though despite its small size it has plenty of power to rotate the average 4 x 5 four-cylinder motor at 80 revolutions a minute drawing from 80 to 100 amperes of current; the gear ratio is 34 to 1.—A larger size measuring approximately 6 x 8½ inches and geared 25 to 1 is estimated to have 100 per cent. greater turning power at the same engine speed. The weight of the former motor is 20 pounds and of the latter 28 pounds. Needless to add, both are of the series wound type.

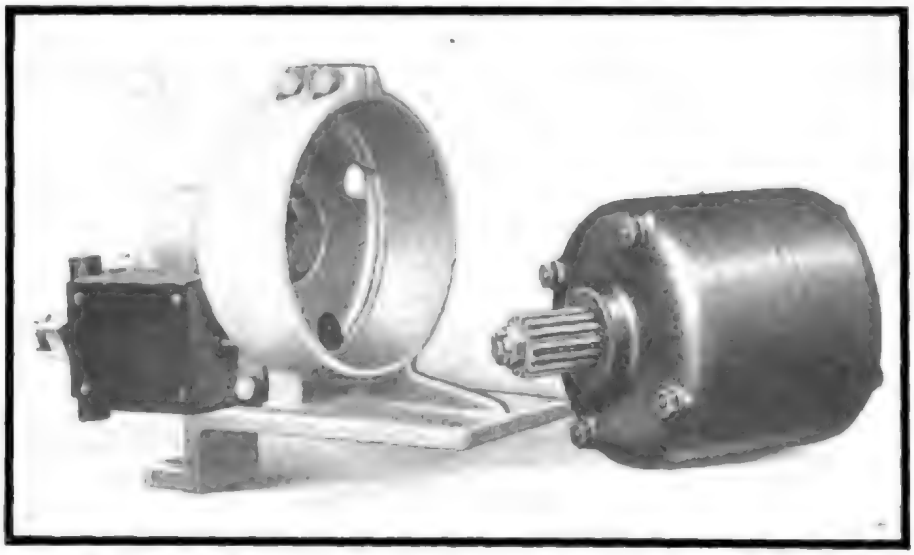
The dynamo also is very small in size, considering the fact that it is designed to operate at magneto shaft speed and that it contains within its own housing both regulating and circuit-breaking mechanism; it measures approximately 5½ x 9 inches over

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all. Its capacity in terms of car speed and engine revolutions is as follows:

5 amps. at 320 r.p.m., or 10 miles per hour
8 amps. at 425 r.p.m., or 13.2 miles per hour
10 amps. at 540 r.p.m., or 16.3 miles per hour
12 amps. at 650 r.p.m., or 20.3 miles per hour
15 amps. at 900 r.p.m., or 28.1 miles per hour

Actually, the dynamo commences to charge a six-volt battery at 190 revolutions a minute, which corresponds, with the average rear axle gear ratio and size of wheels, to about six miles an hour. By reason of the regulation of the dynamo, which is an inherent characteristic, and is not obtained with the aid of any kind of mechanical devices, the current output rises very little, if at all, at speeds above 28 miles an hour. Regulation is effected by means of a differentially connected series winding which permits what is styled "magnetic leakage" by causing the field to weaken when the speed increases above the critical point represented by 28 miles an hour car speed. Obviously, there are no moving parts in the regulating mechanism, and hence it never will require attention. As a matter of fact, none but a factory expert could give it attention, for it is securely hidden within the very vitals of the machine.



ELYRIA-DEAN MOTOR, SHOWING METHOD OF MOUNTING AND ITS GEARING

Circuit Breaker Accessibility.

It is not so with the circuit breaking mechanism, however. As already mentioned, it may be removed bodily for examination in better light or for cleaning or adjustment. Just how simple is the operation is revealed by the fact that but three screws in the top of its casing need be removed. In either taking it off or replacing it, there is not the slightest possibility of the veriest novice harming its mechanism. And when it is in place, the vital parts of the machine, which means, briefly, the commutator and the brushes, are fully protected against accidental damage.

In construction and operation, the cut-out mechanism, or the circuit breaker, or the relay, the terms being synonymous, is orthodox. Which is to say, it is a magnetic device in which there are two coils so arranged that immediately the voltage of the dynamo exceeds the battery voltage, dynamo and battery are connected together through the intermediary of two large surface contacts. The arrangement of the coils is such that the pull of one supplements the pull of the other as the dynamo output increases. Instantly the dynamo output drops below that of the battery, however, the passage of current in the reverse direction through one of the coils causes it to neutralize the pull of the other, the immediate result being that connection between the battery and the dynamo is broken.

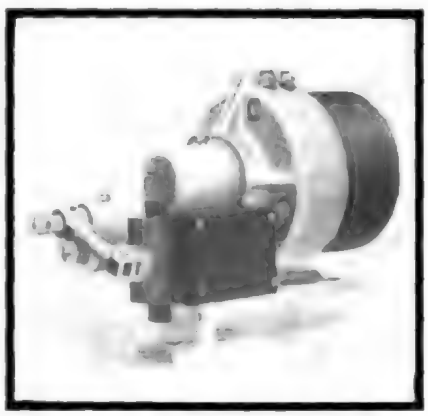
Care and Repair of the Cut-Out.

As has many times been pointed out, the small use the cut-out mechanism gets, due to the fact that it operates only when the engine is stopped and started, and possibly when the car is driven very slowly on high gear, can result in very little wear in any case. Hence, there will be little cause for adjusting it, though it will do more good than harm occasionally to inspect it and make certain that it is living up to its reputation as a safety valve.

There are two ways in which the operation of the device can be ascertained. The first of them is to watch it while the engine is started, speeded up and then stopped, and the second is to note fluctuations of the needle of the ammeter during the same proceeding. The latter method is the best. Judging speed solely by the speedometer, the contacts in the cut-out should come together at six miles an hour and should remain together at all higher speeds. Immediately the speed drops below six miles an hour, the contacts should separate. Both of these operations will be indicated by the ammeter needle. When the contacts come together, the needle will swing over to the charge side and when the contacts open the needle will swing over to the discharge side, provided the lights are burning, or to neutral if no lights are turned on.

How to Clean Contact Points.

If inspection proves that the cut-out is not operating properly, or the condition of the battery indicates it, it is a simple matter to alter the adjustments or to clean the contacts. Probably cleaning is all that will be required, for though the housing is constructed to be dirt-proof, a certain amount of fine dust is very likely to work in during the course of a dusty tour. To clean the contacts, glue two pieces of fine emery cloth to opposite sides of a strip of thin Bristol board and place the improvised "file" between the contacts. Gentle pressure and a few rubs will suffice to clear away accumulations of grease or oxide.



MOTOR AND SWITCH COMPLETE

In adjusting the apparatus it must be remembered that a quarter turn of the screw which brings them closer together may correspond to several miles an hour car speed. Consequently, it always should be a case of "measure twice and cut once." That is to say, turn the screw only a very slight amount and then try the adjustment, and if it is proper tighten the lock nut. It should be remembered, also, that if the apparatus "goes bad" on the road, which is unlikely, and cannot be repaired, the removal of the cut-out mechanism obviates the possibility of damage to the rest of the system. This feature, by the way, is exclusive in the Elyria-Dean apparatus.

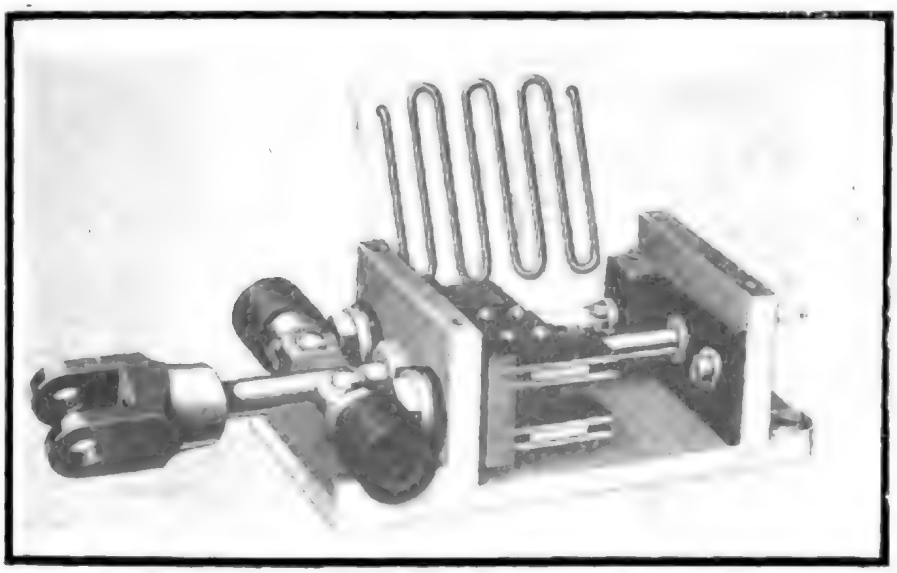
The dynamo itself is scarcely more difficult to care for than is the cut-out mechanism which forms part of it. Both ends of its armature shaft are mounted in liberal-sized ball bearings and, though these are packed with grease before leaving the factory, it is better, to be on the safe side, to place a couple of drops of fine machine oil—

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typewriter oil preferably—in the oil holes once every two weeks.

Importance of Dynamo Inspection.

Otherwise, the care of the dynamo resolves itself into frequent inspection of the brushes and the commutator. These are the only parts that will require attention, and they will not need to be touched as long as the commutator appears glossy and brown. The brownish sheen indicates that it is in the best of condition. If it is very dirty and the accumulation cannot be removed with a small piece of cloth dampened with gasolene, recourse must be had to the sandpaper cure, which consists, briefly, of applying No. 00 sandpaper to the commutator while the armature is running and after the brushes have been removed.



ELYRIA-DEAN STARTING SWITCH WITH COVER REMOVED, SHOWING RESISTANCE

The ignition timer apparatus, which may or may not find a place on the equipment according to the specifications of the car maker, though it is shown by the accompanying picture, need never be touched for it is designed to operate indefinitely without any attention whatsoever.

The Elyria-Dean starting motor is of the plain series wound type and is distinctive by reason of its method of attachment, which permits of its almost instant removal intact and without the necessity for disturbing any other part of the mechanism, including the gearing. It is arranged to drive the gasolene engine through the intermediary of gearing cut in the periphery of the flywheel, the gear case and the starting switch being integral and mounted on a base which serves to hold the motor in position.

As may be seen by the accompanying illustrations, the motor is quite small and fits into the end of the gear case housing, where it is clamped by means of two screws. Loosening the screws permits the removal of the motor complete with its armature shaft gear, as shown by the picture. There are several important advantages in this method of construction, not the least important of which is that it permits the motor to be removed easily for repair, inspection or adjustment without disturbing the lighting equipment. Incidentally, as it is necessary properly to clean the commutator to apply sandpaper while the armature is rotating, this can be done with the use of the minimum amount of current with the motor removed. Similarly, it is quite feasible, while repairs are made, to substitute another motor for the one in the shop.

As the starting motor is used only at comparatively long intervals and then only for a moment at a time, its commutator and brushes will not require as much attention as will the same parts of the dynamo. Consequently, it has not been found necessary to make them so readily "get-at-able." The job is not a difficult one, however, and merely requires a few screws to be taken out, when the end cap may be removed, exposing the commutator and the brushes.

The care that has been outlined for the same parts of the dynamo applies also in the case of the motor. The gearing between the motor and the gasolene engine is simple and the gear wheels are of ample surface to ensure against undue wear. An over-running roller clutch having four contact surfaces effectually prevents the gasolene engine driving the motor when the former is running under its own power.

The gearing is lubricated with grease, there being one grease cup to feed the intermediate gear and the pinion that engages the flywheel gearing. Elsewhere, there are two small oil holes which should receive a couple of drops of oil whenever other parts of the car are oiled. The armature shaft of the motor is carried in large annular ball bearings, and as these are packed in grease they will not require to be touched from one season's end to the next. When it becomes necessary to replenish the grease the operation can be simplified by removing the motor from its frame and opening the end caps. In the event that the starter refuses to operate with its customary vigor, the battery always should be examined first to make sure that it i properly charged.

Operation of the Starting Switch.

The switch which connects the battery an[d] the starting motor is of the knife-blade type and is enclosed in its own housing attached directly to the starter base. As already has been made plain, a single lever serves in one operation to enmesh the gears and to turn on the current. The first movement of the switch connects the battery to the motor through a heavy resistance, which, as is shown by the accompanying picture, is contained in the switch housing. The effect of this connection is to cause the armature of the motor to rotate slowly, thus facilitating the engagement of the gears. Further movement of the lever enmeshes the gears and short-circuits the resistance, throwing the battery directly on the motor, "full speed ahead," so to speak.

Obviously, there is absolutely nothing in the switch that could get out of order except in the case of dire catastrophe to the car. The contacts are large and there is only the one moving part. Access to the switch, by the way, may be had by removing the side plate by taking out four small screws. Though the casing presumably is tight both against dirt and water, it is not unlikely that at the end of a season a certain amount of road dirt will have found its way inside and though the amount may not be great enough to cause trouble, it nevertheless is better out than in.

As there are only two wires in the Elyria-Dean system between the battery and the dynamo and the battery and the starting motor, there should be no particular difficulty in tracing short circuits or breaks, though neither is likely, because of the heavy insulation provided. Still, either is a possibility that must be guarded against by properly taping the wire when it appears likely likely to chafe and allowing small loops where body movement might cause breaks. It is important, of course, that the wires between the battery and the dynamo be properly connected—that the positive side of the battery be connected to the positive side of the dynamo. It makes no difference how the starting motor is connected.

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1,025,336. Automatic Spark-Timing Mechanism for Internal-Combustion Engines. Thomas Townson, Philadelphia, Pa. Filed June 1, 1911. Serial No. 630,638. (Fly ball governor causes rotation of timer.) 2 claims.

1,025,344. Starting Device for Engines. James A. Walker, Rockford, Ill. Filed July 19, 1911. Serial No. 639,405. (Crank shaft connected to starting handle near seat through intermediary of dog clutch and a series of levers and cranks.) 2 claims.

1,025,387. Automobile-Controller. Otto Euler, Jackson, Mich. Filed Jan. 26, 1911. Serial No. 604,743. (Means for locking brake and gearset levers.) 9 claims.

1,025,388. Shock-Absorber for Vehicles. Highland T. Finnell and Ernest Schernikow, New York, N. Y. Filed Dec. 3, 1910. Serial No. 595,519. (Telescoping tubes provided with helical threads to cause relative revolution and a coil spring.) 2 claims.

1,025,400. Resilient Anti-Skidding Wheel. Henry Gaud Hugon, Calais, France. Filed Sept. 11, 1911. Serial No. 648,703. (Metal tread on solid rubber tire.) 3 claims.

1,025,432. Steering Mechanism. Albert Theerman, Dike, Iowa. Filed Oct. 20, 1911. Serial No. 655,779. (Springs attaching to steering knuckles straighten wheels in case of gear derangement.) 1 claim.

1,025,439. Internal-Combustion Engine. Harry Whidbourne, Plymouth, and John James Lishman, Salcombe, England. Filed Aug. 24, 1911. Serial No. 645,819. (Two-cycle, two-cylinder motor with double diameter pistons.) 2 claims.

1,025,528. Demountable Rim. Richard E. Jeffery, Piedmont, Cal. Filed March 29, 1911. Serial No. 617,677. (Rim locked in position by means of keys protruding through wheel felloe.) 3 claims.

1,025,591. Vehicle-Wheel. Charles B. Ross, Greenleaf, Kan. Filed Oct. 17, 1910. Serial No. 587,411. (Helical springs between non-yielding rim and wheel felloe.) 1 claim.

1,025,714. Art of Traction-Vehicles. Wm. E. Paine, New York, N. Y. Filed Feb. 9, 1912. Serial No. 676,589. (Trailer attaching to motor truck.) 4 claims.

1,025,734. Vehicle-Tire. John F. Bosquett, Jersey City, N. J. Filed April 11, 1911. Serial No. 620,311. (Helical spring embedded in tire fabric.) 1 claim.

1,025,762. Auto or Gas Engine Starter and Indicator. George Edward Ocain, Oak Park, Ill. Filed February 17, 1911. Serial No. 609,250. (Means for introducing gases into proper cylinder.) 2 claims.

1,025,782. Carburetter. Henry Lowe Brownback, Norristown, Pa. Filed Dec. 13, 1910. Serial No. 597,131. (Cup, attached to spray jet and provided with a gauze cover.) 3 claims.

1,025,790. Wheel. Enan M. Deal, Philadelphia, Pa., assignor to Edward A. Schneider, Philadelphia, Pa. Filed Sept. 22, 1909. Serial No. 518,932. Renewed Jan. 18, 1912. Serial No. 671,885. (Spokes in the form of cylinders in which pistons act against a contained liquid.) 2 claims.

1,025,804. Automobile Transmission Mechanism. Orion B. Hitchcock, Arthur M. Berggren, and Fred M. Berggren, Morganville, Kan. Filed Dec. 27, 1910. Serial No. 599,351. (Gears always in mesh type; the loose wheels on the shaft being locked at the proper time by a sliding feather.) 2 claims.

1,025,814. Fuel-Supply System for Explosive-Engines. Herman Lemp, Lynn, Mass., assignor to General Electric Co., a corporation of New York. Filed March 23, 1906. Serial No. 318,338. (Fuel forced from tank to carburetter by means of a diaphragm pump operated by the explosive pressure of the motor.) 2 claims.

1,025,816. Carburetter. Jacob Matthias Lofthouse and Emily Rosalie Booty, Perth, Western Australia, Australia. Filed April 10, 1911. Serial No. 620,152. (Inverted bell operated by the pressure in the induction chamber controls gasolene supply.) 6 claims.

1,025,844. Ignition for Internal-Combustion Engines. Claude L. Terry, Elyria, Ohio. Filed March 4, 1910. Serial No. 547,339. (Mercury cup contacts.) 4 claims.

1,025,897. Radiator-Assembling Machine. John D. Beebe, Detroit, Mich., assignor, by mesne assignments, to Briscoe Mfg. Co., Detroit, Mich., a corporation of Michigan. Filed Sept. 30, 1908. Serial No. 455,438. (Machine for assembling vertical tube raditors.) 12 claims.

1,025,966. Revolving Lamp-Support for Autos. James B. Estes, Konawa, Okla. Filed June 3, 1911. Serial No. 631,147. (Revolving brackets attaching to the steering mechanism). 1 claim.

1,025,981. Spring-Wheel. Frederick H. John, Middleport, Pa. Filed June 19, 1911. Serial No. 633,947. (Spokes in the form of strip steel springs.) 2 claims.

1,025,987. Tire-Tool. Adam A. Long, Rochester, N. Y. Filed July 26, 1906. Serial No. 327,883. (Lever, fulcrumed on the wheel hub, detaches the tire bead.) 22 claims.

1,026,038. Tire. George S. Howe, Richmond, Va. Filed May 6, 1911. Serial No. 625,613. (Leaf springs interposed between flexible tread and wheel felloe.) 4 claims.

1,026,073. Transmission-Gearing. George W. Bulley, Chicago, Ill., assignor to Holsman Equipment Co., Chicago, Ill., a corporation of Illinois. Filed Feb. 27, 1911. Serial No. 611,249. (Enclosed type of planetary gearset.) 11 claims.

1,026,077. Dual Ignition System. Charles Cuno, Meriden, Conn., assignor to the Connecticut Telephone & Electric Co., Inc., Meriden, Conn., a corporation of Connecticut. Filed Nov. 10, 1910. Serial No. 591,584. (Means for connecting battery circuit through transformer and cirucuit breaker.) 12 claims.

1,026,098. Spring-Vehicle. Richard Liebau, Watervliet, N. Y. Filed July 27, 1910. Serial No. 574,160. (Pneumatic spring supported by levers in place of leaf springs.) 17 claims.

1,026,146. Steering Mechanism for Vehicles. Edward W. Bliss, Rochester, N. Y. Filed May 5, 1909. Serial No. 493,996. (Double steering rod, the two members being geared together and operating on the same worm wheel.) 2 claims.

1,026,168. Safety Attachment for Automobiles. Thomas B. Jeffery, Kenosha, Wis.; Kate E. Jeffery, Charles T. Jeffery, and Harold W. Jeffery executors of said Thos. B. Jeffery, deceased. Filed Dec. 30, 1909. Serial No. 535,605. (Lock for starting handle, operated by the gearshift lever when speeds are engaged.) 2 claims.

1,026,189. Locking Device for Automobile-Cranks. Charles A. Wheeler, Bridgeport, Conn., assignor of one-half to the Smith & Egge Mfg. Co., Bridgeport, Conn., a corporation of Connecticut. Filed June 20, 1911. Serial No. 634,311. (Lock and chain for preventing operation of starting handle.) 2 claims.

1,026,201. Spring-Tire. George Burson, Winamac, Ind. Filed July 20, 1910. Serial No. 572,947. (Helical springs interposed between flexible tread and wheel felloe.) 1 claim.

1,026,220. Vehicle Wheel and Axle. James E. Murray, McKeesport, Pa. Filed April 21, 1910. Serial No. 556,681. (Steering knuckle formed in the plane of the wheel spokes.) 5 claims.

1,026,279. Combined Bumper and Fender. Harry T. Myers, Chicago, Ill. Filed Feb. 21, 1910. Serial No. 545,207. (Fender is lowered when bumper is hit.) 11 claims.

1,026,317. Internal-Combustion Engine. James F. Hopper, Sherman, Tex., assignor of one-half to Hamlet C. Smith, Sherman, Tex. Filed July 26, 1911. Serial No. 640,714. (Two-cycle motor with separate compressing cylinder and two crankshafts geared together.) 2 claims.

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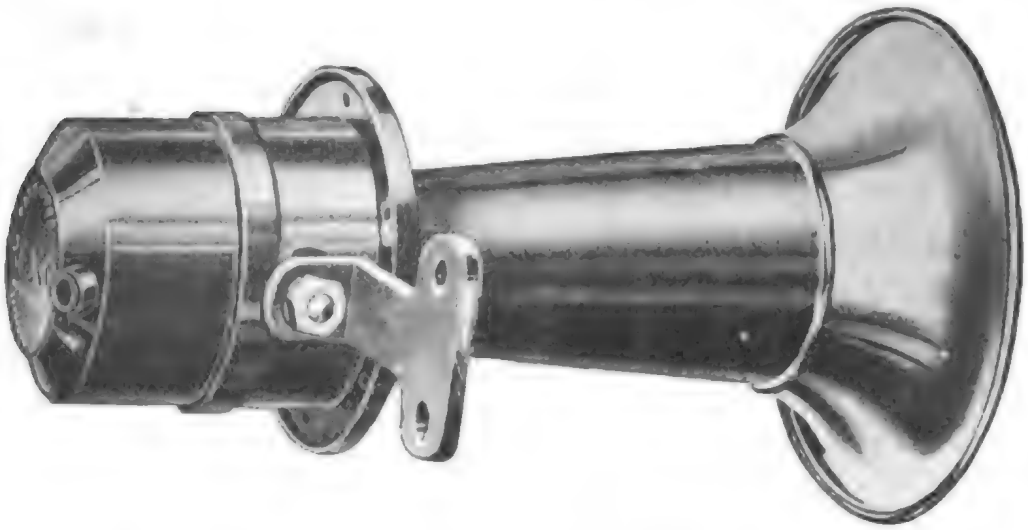
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The Rexo Always Acts When Needed

The Rexo single-tone horn protects your own safety and that of other people because it always works—it never refuses to act just when it is most needed.

It gives out a strong warning note **every time** the button on the wheel is pressed, and commands **immediate** attention from pedestrians and drivers of other cars.

The Rexo horn is reliable because it is simple and free from complications. It has no parts to get out of order—it is substantial and well-built to stand the jarring and vibration of the car's motion—and it is finished so that the weather has no effect on its appearance or its operation.

Because the Rexo is so reliable and so trouble-proof we guarantee it for life.

The Rexo costs little for upkeep, as it operates with a small amount of current and can be connected to any 6-volt battery, an advantage in both cost and space saving.

This splendid horn takes none of your time or money for frequent overhauling or attention to lubrication or repairs. A slight adjustment once a year, made with a screw driver, is sufficient to overcome a season's wear.

The popularity of the Rexo is shown by the fact that more than 75,000 of these horns were sold for use on 1913 cars as **regular equipment.** Enormous sales to owners of cars make this the most widely used, low-priced horn made.

In addition to the Rexo, which sells for $8, complete, we make the Tuto, a high grade two-tone horn for $25, and the Tutoette, a smaller two-tone horn for $17.50.

Elyria-Dean Products Manufactured Only By

THE DEAN ELECTRIC COMPANY

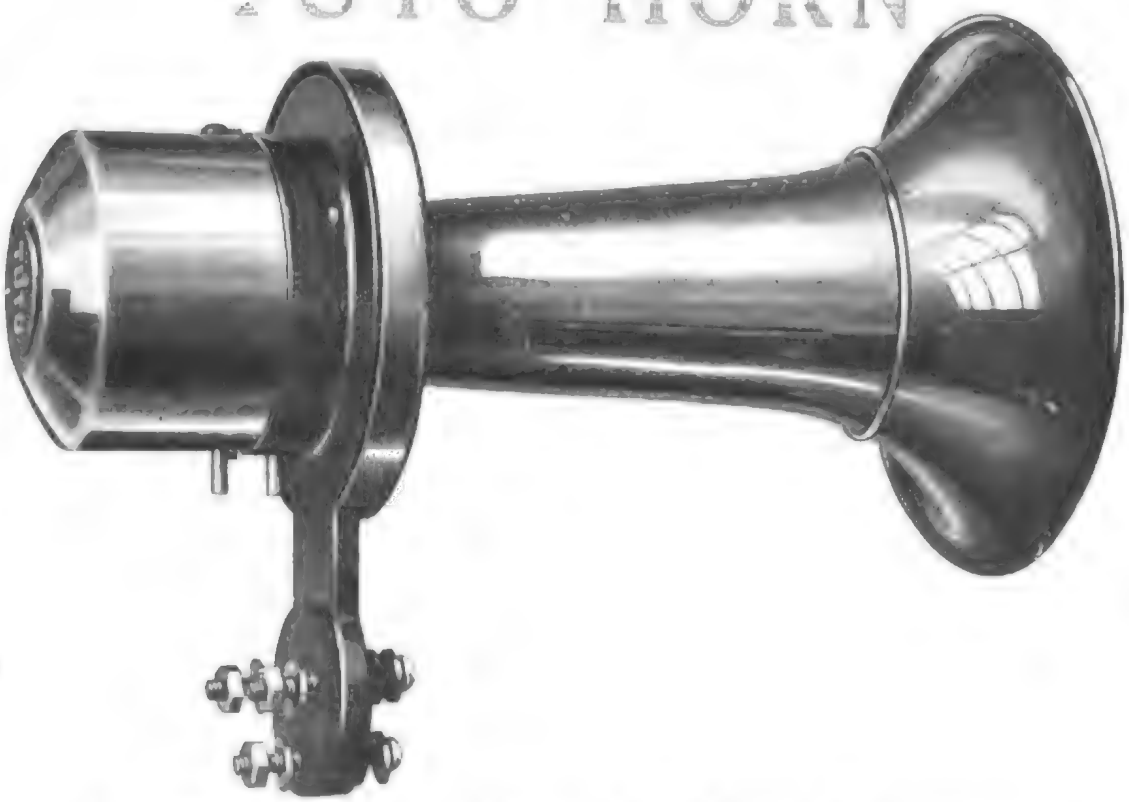
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The TUTO—The Horn for Careful Drivers

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It is a complete signaling system. It electrically transmits two different and distinct sounds through a horn—one low and mild for ordinary usage, the other loud and penetrating for critical situations and emergencies. The degree of sound is regulated by the degree of pressure given the button located upon the steering wheel.

The Tuto is very reliable and absolute confidence can be placed on its perfect operation at all times. It is free from trouble-making parts and requires no care or attention except perhaps a slight adjustment once a year to overcome the season's wear.

It operates by any 6-volt battery and costs little to maintain, as the low tone, which uses little current, is sufficient for most of the signaling done.

The Tuto horn is substantially and carefully built of the highest grade material and lasts for many years. Its satisfactory service and long life are insured by a liberal guarantee, in fact, a guarantee for "Life."

Finished in polished brass or nickel, plain black enamel, and black enamel with brass or nickel. Price, $25.00, complete with button and cord.

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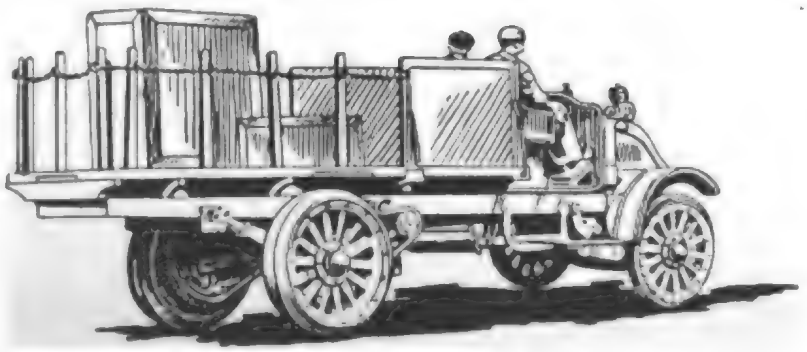
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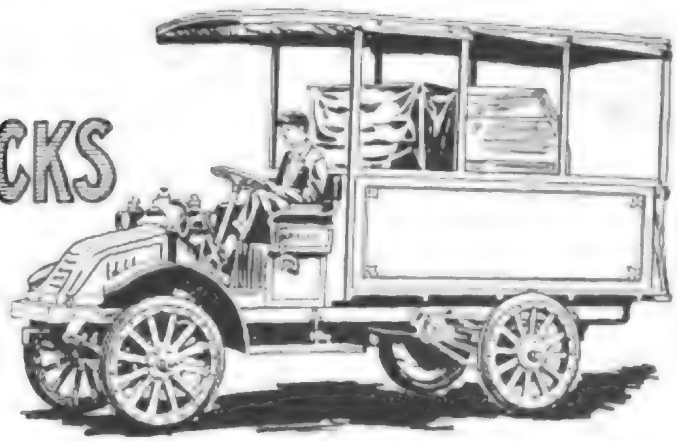
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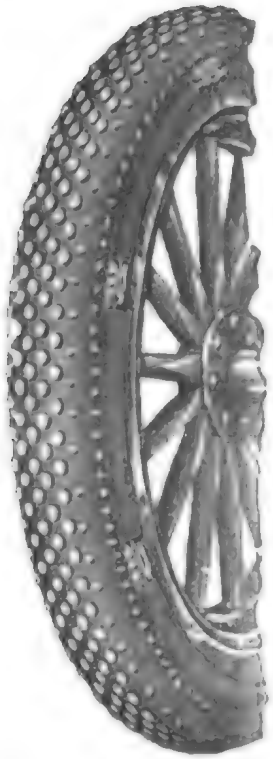
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WOODWORTH TREADS are not fastened to the rims, but are drawn constantly snug by stiff coil springs around their edges. All stretch is taken up by this elastic tension, and the Tread hugs the tire as if a part of it. Yet the Tread is thin, soft, glove-like. Dirt does not enter, because the constant pressure of the Tread against the tire squeezes it out.

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by selling these tire trouble eliminators to doctors, real estate men, contractors, suburban business men, users of pneumatic-tired delivery wagons, women drivers, and all others among your patrons who want tire service without the work, delays and risk involved in using bare tires! One sale brings others, for users who try the genuine WOODWORTH TREADS soon become enthusiasts.

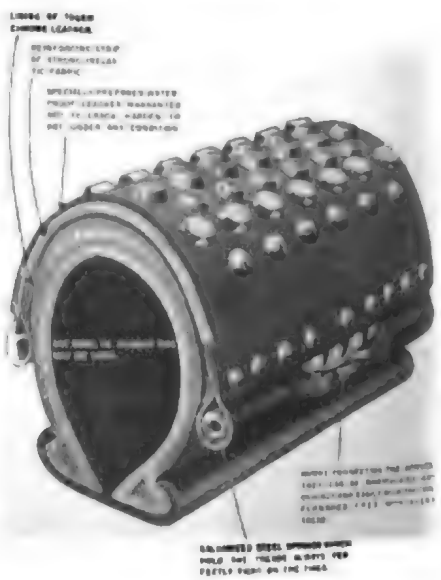
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for you to start. Our guarantees protect both you—the dealer—and your patrons absolutely against loss. Our Dealers' Order-Taking Outfit enables you to show the goods without even laying in a stock.

And if you wish to try the Treads for your own satisfaction (as we hope you will, although we do not require it) we shall be glad to furnish you a trial pair with the understanding that if they are not perfectly satisfactory they may be returned in 30 days and the price refunded. You will find them an invaluable trouble-saver on your renting or emergency car.

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Automobile racing is by far the most severe test of spark plugs. During these contests they are constantly flooded with oil, exposed to extreme heat and severe vibration. Only plugs of the sturdiest construction can withstand the shocks, the smashing rebounds, the terrific strain of high compression, the intense blue flame of the burning gases which surrounds them for hours at a time. The plugs that can survive such abuse must be strong, tough, heat proof—the highest degree of perfection. They must be Bosch Plugs.

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BOSCH Plugs have stood these strains, stood them so well, so wonderfully, that practically every race of importance during 1911 and 1912 was won by cars employing Bosch Plugs—the "also rans" used them too. The drivers who know—the manufacturers whose experience has taught them to provide the best they can procure for their racing cars—have universally adopted Bosch Plugs.

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The success of the Bosch Spark Plug is not thru chance; if you could see one, test one, try to break it down, you would understand why Bosch results are inevitable. The price, **1.00 Each** does not measure the value, in comparison with other plugs; it represents manufacturing cost plus a fair profit on the best spark plug that can be made.

Don't be satisfied with "enough" power—use Bosch Plugs and enjoy the maximum. Let us send you our booklet "Locating the Spark Plug," it tells you what you ought to know about plugs.

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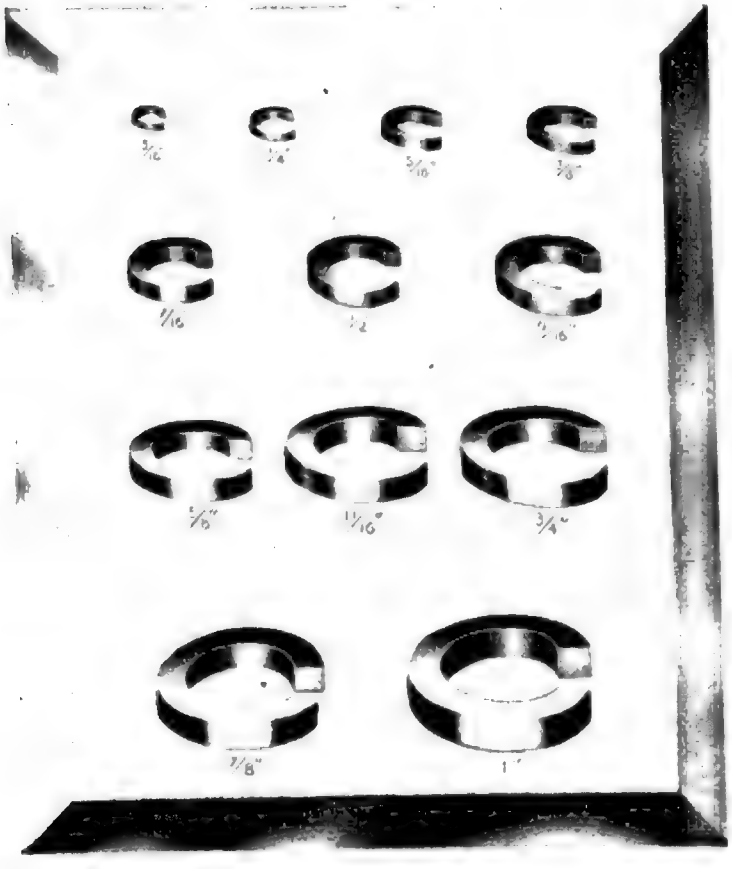
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PORTLAND, ME., Maine Motor Car Co.; BOSTON, Motor Parts Co.; BUFFALO, Jas. G. Barclay, Inc.; ROCHESTER, A. M. Zimbrich; PHILADELPHIA, Motor Parts Co.; PITTSBURGH, Doubleday-Hill Electric Co.; BALTIMORE, Carl Spoerer's Sons Co.; RICHMOND, VA., Dallas A. Shafer & Co.; ATLANTA, Johnson-Gewinner Co.; TOLEDO, W. G. Nagel Electric Co.; MINNEAPOLIS, Pence Automobile Co.; DES MOINES, Herring Motor Supply Co.; OMAHA, Powell Supply Co.; KANSAS CITY, MO., Kansas City Auto Supply Co.; ST. LOUIS, Phoenix Auto Supply Co.; DENVER, Fry & McGill Motor Supply Co.; SEATTLE, Ballou & Wright; PORTLAND, ORE., Ballou & Wright; LOS ANGELES, E. A. Featherstone.

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National Automobile Lock Washers



Twenty Seven Years' Experience

in the manufacture of Lock Washers places us in a position of authority. It has taught us many things.

Then why not get the benefit of this experience, plus abundance of resources and service that counts?

It will pay in the end.

THE NATIONAL LOCK WASHER COMPANY

CHICAGO, ILL. NEWARK, N. J.

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School of Hard Knocks

This is to Certify
that the



Red Head
REG U S PAT OFF

SPARK PLUG

has completed a four years' course in All Types of Engines, and having proven its Mastery in Cranky, Oily and High Powered Pleasure and Racing Cars, Commercial Vehicles, Speed Boats and Motorcycles, is hereby declared a

Graduate

and Awarded this

DIPLOMA

MARCH 4TH 1913

C. P. Brockway
ENG. INTER-STATE AUTOMOBILE CO

W. A. Reid
ENG J. I CASE T. M CO. RACINE

Oscar C. Gross
ENG GRAY MOTOR CO DETROIT.

J. J. Wagner
OFFICIAL STARTER A. A. A.

Ralph De Palma
WINNER VANDERBILT CUP

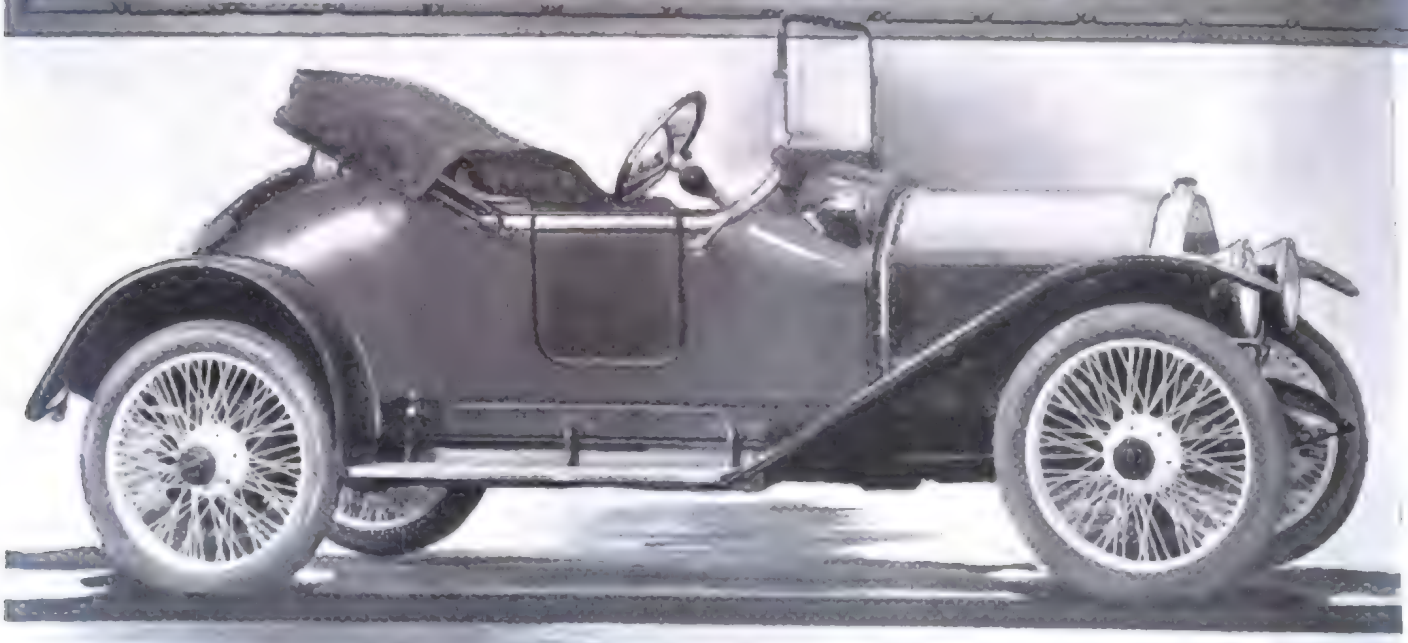
Louis Disbrow
DIRT TRACK KING

Harry Endicott
WINNER WISCONSIN CHALLENGE TROPHY

Mod Roberts
WINNER PABST BLUE RIBBON TROPHY

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McCUE WIRE WHEELS



WIRE WHEELS---the last and most important wood replacement, making the car what it should be---a creation of metal throughout!

Europe grasped the wire wheel idea and adopted it before it had secured even a foothold in America, and European car builders make mighty few mistakes.

Now the wire wheel has captured this country and its adoption by American car manufacturers is increasing with marvelous rapidity.

The reasons are obvious.

McCue wire wheels acknowledged leaders in the American industry are strong. They are practically indestructible, surviving shocks that would prove instantly fatal to wooden wheels.

Sudden changes of heat, cold and moisture cannot warp, crack or otherwise depreciate them. Steel is steel when wood has outlived its usefulness.

As tire economizers they offer the owner a value too great to be overlooked, and in this, Mr. Dealer, lies the most powerful sales appeal you can make---the appeal to the buyer's sense of economy.

Digitized by Google

AND AXLES

McCUE design gives extreme lightness at the rim---the greatest weight at the hub. This reduces the "pound" or hammering effect on the tire to a minimum.—

And it is the heavy blow of the wooden periphery, or the wire wheel with detachable rim that pounds the life out of the tire in short order, decreasing its life as high as fifty per cent.

When you specify McCUE WIRE WHEELS on the cars you sell, then you specify strength, lightness, indestructibility and most important *tire economy*.

It is clearly up to you to get into the wire wheel class---*right now*. Your trade wants wire wheels. Put it up to the men who make the cars.

Standard Company Spokes

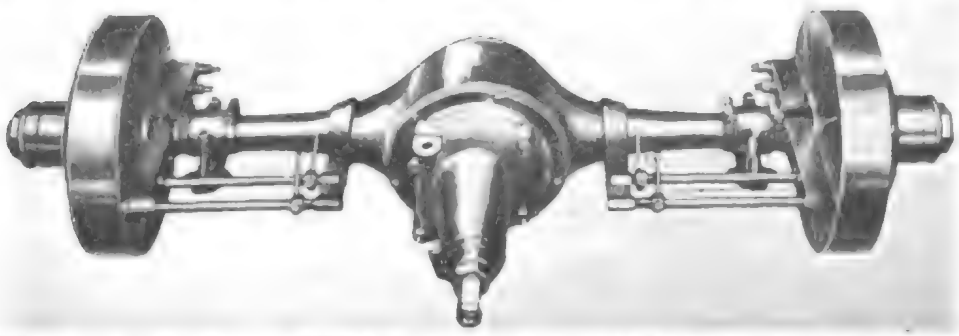
Are used exclusively in the construction of McCUE WIRE WHEELS. Made from wire of the same standard set by the Coventry, (England) Swaging Concern. They offer tremendous torsional and tensional strength, combined with extreme bending quality made possible only by the special drawn carbon steel used in their construction.

McCue Axles

Represent the best in axle making, material, design and workmanship. All combine to give maximum service under all conditions of road shock, side thrust and load.

If your customers want wire wheels you write to the manufacturer for inner hubs and wire wheels to go on the particular model to be so equipped. We are situated so that we can meet this demand for the manufacturer.

THE McCUE COMPANY, Buffalo, N.Y.



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A Pure Food for Motors

¶ If there was a Pure Oil Law—like the Pure Food Law—90% of the present oils would be condemned.

INVADER OIL

is a pure oil. It is distilled from Pennsylvania crude. It is filtered. It has a high gravity, and it is freer from carbon than any other oil made.

INVADER OIL CO., 80 Broad St., NEW YORK

(Lessees of Charles F. Kellom & Co.)

PHILADELPHIA
113 Arch Street

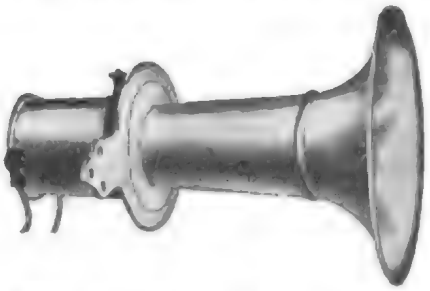
NEW ENGLAND BRANCH
284 Columbus Avenue, Boston

WASHINGTON
3556 11th Street, N. W.

I. O. C. GEAR OIL is the only oil manufactured especially and exclusively for the lubrication of Automobile transmission gears. Write for descriptive booklet and prices.

Digitized by Google

NEWTONE SUPERIOR

$10  **$10**

The First Efficient Motor Horn to Sell at a Popular Price

From orders already received we will make and sell

Over 100,000 Newtone Horns in 1913

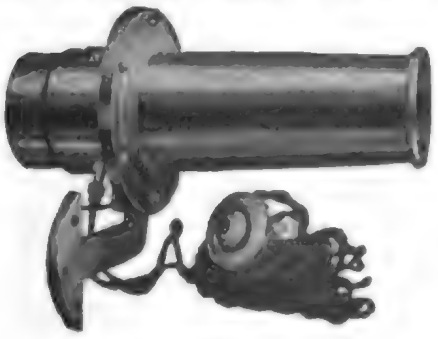
This is a record never before equalled in the history of the electric warning signal and clearly demonstrates the unquestionable superiority of Newtone products.

WHY We Make the Best Horn for the Least Money

We are the largest Auto Horn Makers in the World.
We supply over 75 per cent of the trade with different types of horns.
Our Factory is the largest—our Machinery of the best.
Our facilities in every way are superior.

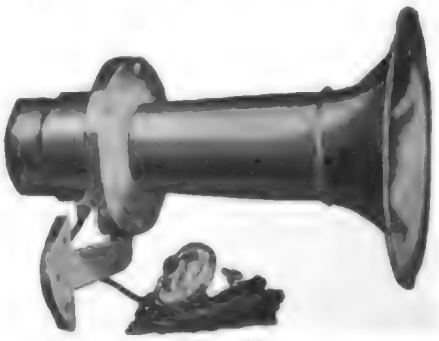
In the past eight years we have made and sold over ***One million two hundred and fifty thousand horns*** of different types and sizes.

Every Detail Makes for EFFICIENCY and ECONOMY



Torpedo Type

TORPEDO TYPE
and
Type M
Price $20



Type M

Price and Quality Rule—Always

Write for Catalogue

Automobile Supply Manufacturing Company

220 Taaffe Place **BROOKLYN, N. Y.**

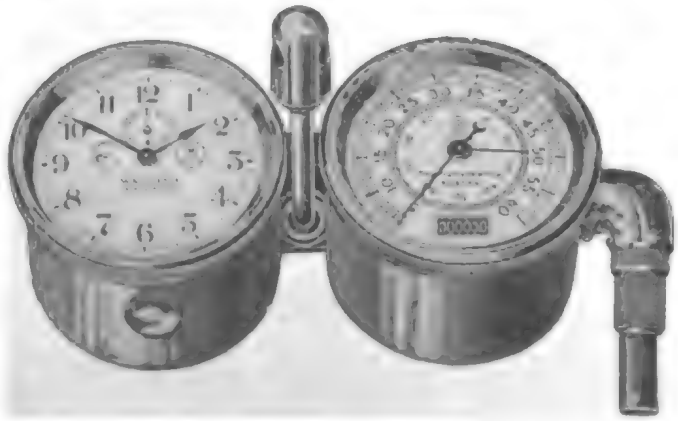
HOFFECKER'S SPEEDOMETERS

THE QUALITY THAT CAR DEALERS-MANUFACTURERS

The name "Hoffecker" on a speedometer and "Waltham" on a timepiece stand sponsor for quality that is standard and of world-wide reputation. Car owners who read and reason before they buy, ***know*** this quality and ***demand*** it.

No enlargement on the prestige of the Hoffecker and Waltham products is necessary here. This has been established through years of consistent service. It is rather the present intent to ***show how*** it is commercially possible to produce these instruments of precision and durability at prices within reason.

Hoffecker speedometers and Waltham timepieces have never been extravagantly exploited. They have never had quality sacrificed to meet tremendous advertising overhead expense. They embody sterling worth in material, fine workmanship and finish, ***made possible only by the money that goes right into the instrument—not into indiscriminate waste publicity.***





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COMBINATION OWNERS DEMAND WALTHAM TIME PIECES

READ THE MESSAGE



Of course, they *are* advertised, but *always* on the "bull's eye" basis, and with no "scattering fire" effort. This publicity has value plus—for the car manufacturer, the dealer and ourselves.

Read why. The double-page reduced advertisement shown here, is typical of Hoffecker-Waltham advertising, current in ***Motor, The Automobile*** and ***Motor Age***—three papers that practically cover the cream of car owners who, as readers of these publications, are qualified to recommend and buy intelligently. In brief, this group constitutes a buying and selling force in the field. Through reading and observation, they recommend the best to others and demand the best for themselves.

"Hoffecker-Waltham" is a combination that *your* trade wants. It is a combination that will make a good car better, lessen resistance and increase your prestige in your community as a dealer who is known as a believer in standard, dependable merchandise.

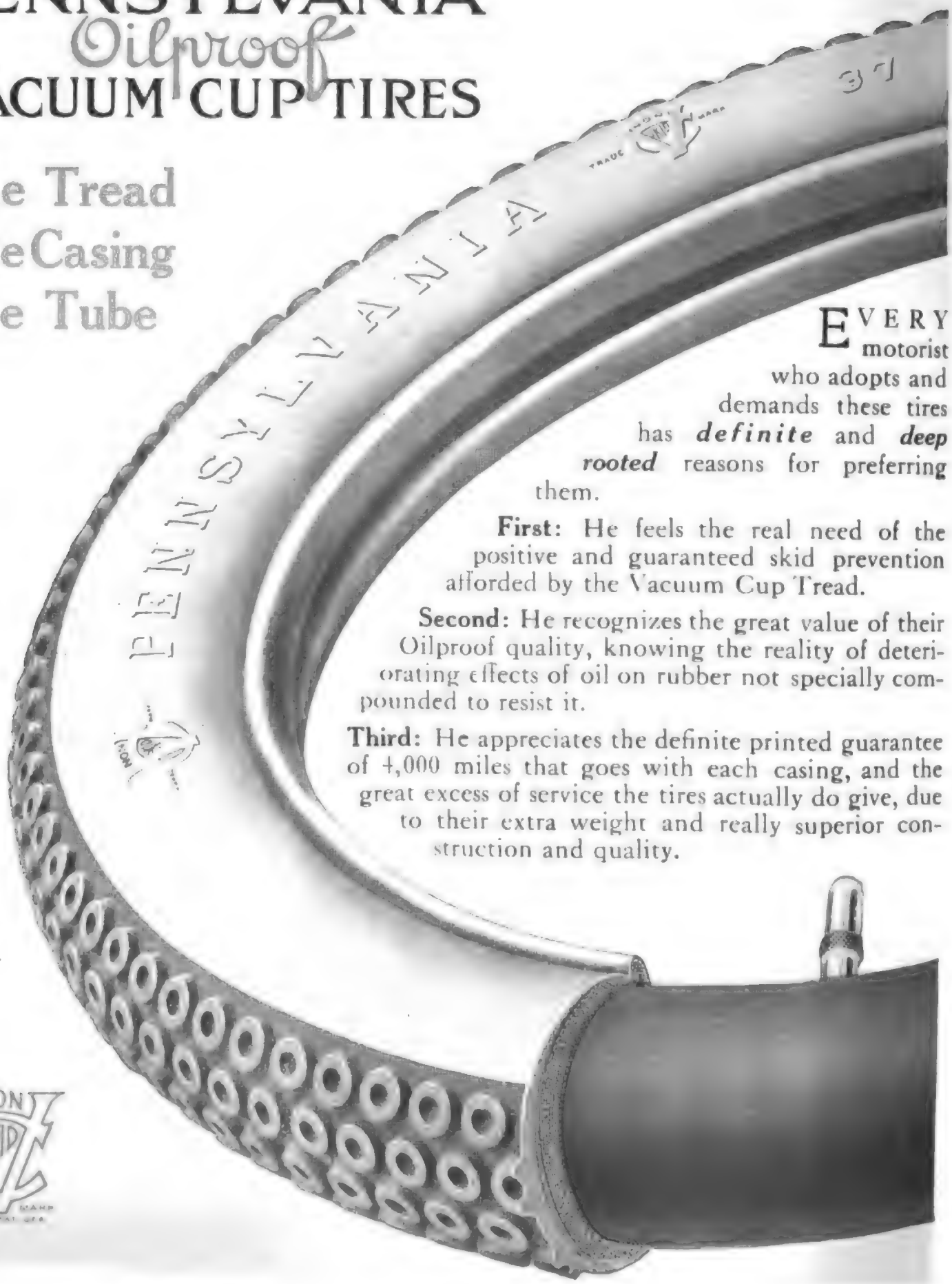


In all probability the cars you sell *are* so equipped—if not then get all the facts from us—you may be able to help your customers to more and better service.

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PENNSYLVANIA Oilproof VACUUM CUP TIRES

The Tread
The Casing
The Tube



EVERY motorist who adopts and demands these tires has ***definite*** and ***deep rooted*** reasons for preferring them.

First: He feels the real need of the positive and guaranteed skid prevention afforded by the Vacuum Cup Tread.

Second: He recognizes the great value of their Oilproof quality, knowing the reality of deteriorating effects of oil on rubber not specially compounded to resist it.

Third: He appreciates the definite printed guarantee of 4,000 miles that goes with each casing, and the great excess of service the tires actually do give, due to their extra weight and really superior construction and quality.

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AND because these definite advantages can be had only in Vacuum Cup Tires, those who demand them are far more in earnest about it than those who buy "just tires" with perhaps a leaning for "this tire" or "that tire."

Dealers in making up their tire stocks for the coming season should have regard not only for the ***compelling volume*** of the demand for Vacuum Cup Tires, but also for the even ***more compelling character*** of that demand. For it's a de***mand*** with the accent strong on the last syllable.

And Finally This Tube—The Pennsylvania "Puregum" Red Inner Tube—the finest grade and quality ever manufactured anywhere. So good that it is a distinct credit to the dealer who sells it, and a new satisfaction to the motorist who buys and uses it.

Pennsylvania Rubber Company

JEANNETTE, PA.

BRANCHES

Pittsburgh, 505 Liberty Avenue
Cleveland, 1837 Euclid Avenue
Detroit, 254 Jefferson Avenue
Chicago, 1004 Michigan Avenue
Minneapolis, 34 S. 8th Street
Kansas City, Mo., 514 E. 15th St.
Omaha, 215 S. 20th Street
Seattle, Armour Building

PENNSYLVANIA RUBBER COMPANY OF NEW YORK
New York City, 1700 Broadway
Boston, 149 Berkeley Street
Dallas, 411 S. Ervay Street

PENNSYLVANIA RUBBER COMPANY OF CALIFORNIA
San Francisco, 512-514 Mission Street
Los Angeles, 930 S. Main Street

An Independent Company with an Independent Selling Policy

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LOOK for THE *Guide* NAME PLATE



A Good Lamp Is a Lamp that Makes Good

We put a name plate on every Guide Lamp and after the owner has used that lamp for a year, the name plate becomes a valuable advertisement for us. The reason for this is that the reflectors are protected from dust and moisture and therefore do not "go foggy" after a little real service.

Another thing, the lamp is so reinforced that it stands vibration and don't get loose-jointed and start to rattle.

Further—and very important—the electric fittings are big enough and substantial enough to stand the hardest kind of service.

These are some of the reasons why Guide Lamps stand ace high with owners and get the name

THE LAMP OF THE GREAT WHITE RAY

Our dealers are making money. They sell Guide Lamps that won't come back to customers who will come back bringing their friends along to get Guide Lamps.

We co-operate with our dealers and help them get business.

Better write today for Guide Book No. 6 and our dealer proposition.

The Guide Motor Lamp Manufacturing Co., 2071 East 4th Street Cleveland, Ohio

Full Display of Our Goods in Accessories Department, Boston Automobile Show, at Exhibit of Our Eastern Agents, T. F. Russell & Co.

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SPRINGFIELD
CONVERTIBLE BODIES

Springfield Metal Bodies are standard on the majority of America's leading cars for the very good reason that they embody all the quality made possible by years of experience in the art of aluminum and steel body construction. This illustration shows one of the many body designs turned out by our factory.

With a Springfield Convertible Body it is actually possible to convert an open car into a glass enclosed car, luxurious in appointments and beautiful both inside and out.

The operation takes but a few moments—the result should be actually seen to be appreciated.

Weight is important in considering the ordinary closed body. Excessive weight of such a body reduces speed and adds to tire weight. Springfield Convertible Bodies, as compared with the common type, increase the weight of the open car only 50 or 75 pounds.

Springfield Convertible Bodies are noiseless. There is no rattle or squeak, and owing to the absence of a solid roof there are no reverberations so noticeable in limousines and landaulets.

There is much more to be said. Your inquiry will bring the details.

SPRINGFIELD METAL BODY CO.
Springfield, Mass.





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Stewart Speedometer

MAGNETIC PRINCIPLE



The Stewart is the only speedometer made with a grade indicator

Model B
$50

95% of All The Speedometers Made Are Built on The Magnetic Principle

¶ The Stewart Speedometer is built on the magnetic principle.

¶ Ninety-five per cent of all the speedometers to be made during 1913 will be built on the magnetic principle—the other five per cent will be odds and ends built on the centrifugal principle.

¶ Two hundred and eight out of two hundred and fourteen automobile manufacturers have chosen the proven and practical magnetic speedometer in preference to the obsolete and inaccurate centrifugal type.

¶ Over 92 per cent of the largest producers of popular priced cars have selected the magnetic for 1913.

¶ Over 97 per cent of the largest producers of medium priced cars have selected the magnetic for 1913..

¶ Over 98 per cent of the largest producers of high priced cars have selected the magnetic for 1913.

¶ Why argue?

Stewart Speedometer Factory

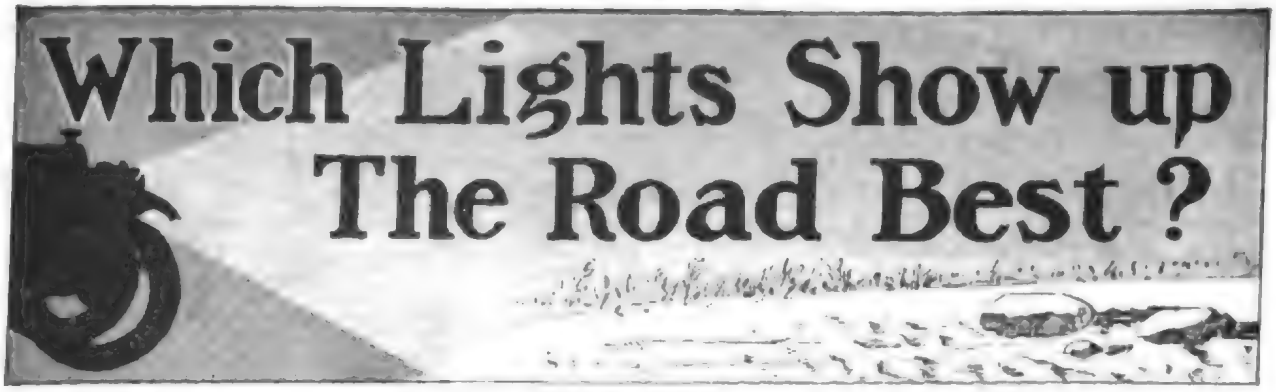
1949 Diversey Blvd., Chicago, U. S. A.

Service Stations at

Atlanta	Cincinnati	Indianapolis	New York	San Francisco
Boston	Cleveland	Kansas City	Pittsburgh	Toronto, Ont.
Buffalo	Denver	Los Angeles	Philadelphia	London
Chicago	Detroit	Minneapolis	St. Louis	Paris

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Which Lights Show up The Road Best?



Do you want a powerful glare for your lights to blind and confuse an approaching car or team?

Or do you want lights to search out the ruts and inequalities of the road? The illustrations of the lamps here show the difference.

Any experienced driver will tell you that with Prest-O-Lite at night, he sees the inequalities of the road even better than by sunlight. This effect is impossible with lamps that concentrate the rays into one blinding glare.

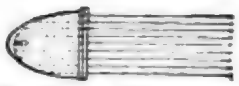
This is but one of the many questions you must consider before you accept any lighting system.

Convenience may appeal to you strongly. With the Prest-O-Liter or any other good automatic lighter, gas lighting affords you every convenience. You can easily light or extinguish gas head, dash or tail lights from the seat.

But the big feature in your choice of a lighting system for your car should be reliability. Over five hundred thousand experienced drivers will testify to the absolute reliability of Prest-O-Lite. Its exchange service extends everywhere. There are no repairs to make. And considering the cost of power consumed, replacements and repairs on other systems, Prest-O-Lite is by far the most economical.

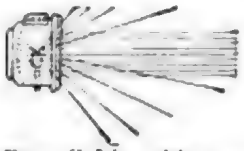
No matter what self-starter you have on your car insist on gas lighting. Self-starter convenience is safe-guarded by the use of the crank in emergencies. It is even more important that lighting convenience be safe-guarded by the use of a match to insure light in emergencies. Almost any manufacturer will equip your new car with Prest-O-Lite and an automatic lighter if you insist. If your car is now equipped with Prest-O-Lite any dealer or any of our service stations can instal an automatic lighter at small expense.

1-4 Mile Ahead



The lamp with a parabolic reflector directs its blinding rays far ahead, but cannot diffuse the light to show the ruts in the road directly before the car.

40 Feet Ahead



Prest-O-Lite with a concave reflector gives all the light you need far ahead but also concentrates light on the road in front of the car where you need it most.

By all means, before you decide on any lighting system, send for the vital facts on automobile lighting. The coupon attached will bring you a free book on this subject by return mail. Send for it NOW and know the facts.

To Dealers:

It is just as important from your standpoint that the lighting system on the car you sell is thoroughly reliable, efficient and trouble-proof as that the motor and transmission will stand up under every day use.

You are blamed, first of all, when the lighting system goes wrong. Remember that when you specify Prest-O-Lite Equipment you protect yourself as well as your patron.

The Prest-O-Liter, or any other efficient automatic lighter for gas lamps, enables you to offer every convenience of the most complicated and expensive lighting systems, without sacrificing reliability and safety. Should the convenience ever fail—the user still has light. Remember this when selling a car.

It is to your interest to keep in touch with our campaign for reliable and safe automobile lighting. The coupon will bring full information.

The Prest-O-Lite Company, 287 East South Street INDIANAPOLIS, IND.

CANADIAN FACTORY AND GENERAL OFFICE, MERRITTON, ONT.

BRANCH STORES AND SERVICE STATIONS IN THESE CITIES: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Memphis, Tenn., Milwaukee, Minneapolis, New Orleans, New York, Omaha, Philadelphia, Pittsburgh, Portland, Ore., Providence, St. Louis, St. Paul, Minn., San Antonio, San Francisco, Seattle, Syracuse.

SERVICE STATIONS IN CANADA: Merritton, Ontario; Toronto, Ontario; Winnipeg, Manitoba. EXCHANGE AGENCIES EVERYWHERE.

Insist on Gas Lighting

THE PREST-O-LITE COMPANY,
287 E. South Street, Indianapolis, Ind.

Please send free booklet, "Light on the Lighting Problem," to

Car Owner?..... Dealer.....

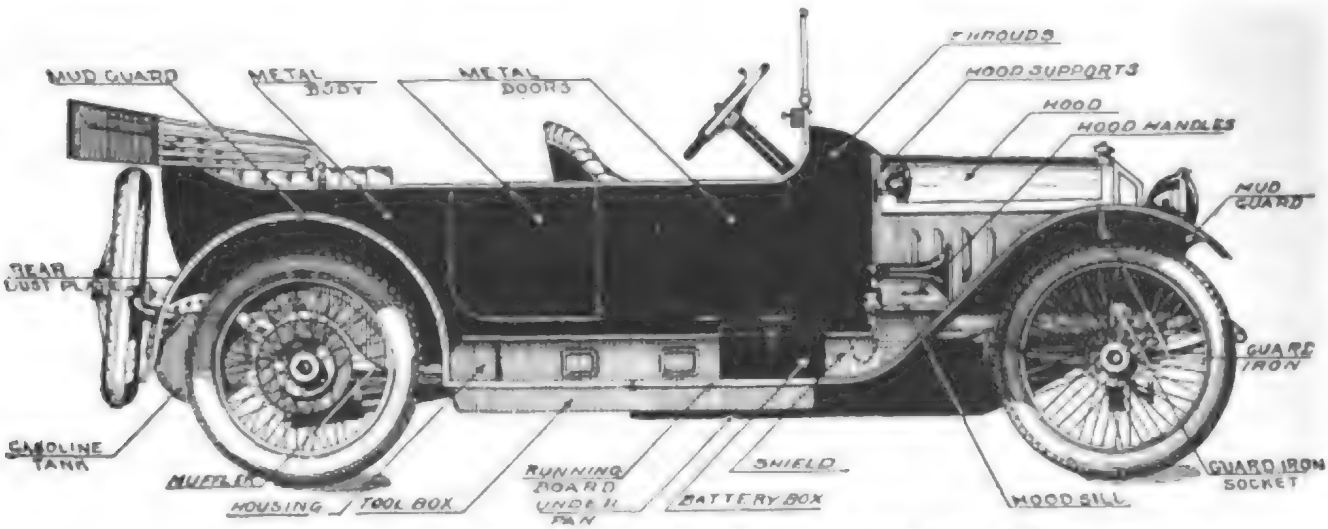
Name .....

Address .....

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HAYES MFG. CO. HAYES DETROIT, MICH.

How the Hayes Organization Aids Motor Car Manufacturers to Larger Output and Greater Economy



The New Edwards-Knight Car, Designed by the Edwards Motor Car Co.

SPECIALIZATION is the order of the day. It means a better product at a lower price, for those who specialize in one line alone become experts. "This one thing I do well" is the specialist's motto.

Nine Years' Experience

¶ For nine years the Hayes Manufacturing Company have been building sheet metal parts for automobiles. During this short period they have become the largest users of sheet metal in the world and supply the majority of motor car manufacturers with all or part of their sheet metal parts.

¶ There are twenty different sheet metal parts (see diagram above) which the Hayes Organization turn out for motor car manufacturers.

¶ Experience, immense facilities, special machinery, tremendous buying power, specialized workmen, all contribute toward high quality and low price of the Hayes products.

They Buy at Lowest Price

¶ Being the largest users of sheet metal in the world, the Hayes Manufacturing Company naturally has an immense advantage in buying sheet metal in the open market. The enormous quantity compels the lowest price and is a big factor in enabling the Hayes Company to under-bid the motor car manufacturer himself in building sheet metal parts.

Can Speed Up Output

¶ There is a big advantage to the car manufacturer in having his sheet metal parts delivered to him by the Hayes Manufacturing Company. It enables the car manufacturer to forget his sheet metal problems and devote a larger share of his factory to assembling. It speeds up the output. It increases dividends at the end of the year.

Handsome Bodies Sell Cars

¶ First impressions count a great deal in selling cars. The curve of the body, the sweep of the fender, the lines of the running board—all contribute toward the sale. The eye sees only the sheet metal parts at the first glance. The chassis is hidden under them. The Hayes organization have specialized in beauty of line and curve.

Sample Sets Prove Claims

¶ Have a sample set of sheet metal parts made up by the Hayes organization. They will add distinction to any automobile.

Hayes Engineers Show Short Cuts

¶ Send in your blue prints to the Hayes organization. Let the Hayes engineers go over them and point out the short cuts and money-saving ideas which our extensive experience points out. We are always at your service. Ask the Hayes organization about your sheet metal problems.

HAYES MANUFACTURING COMPANY, Detroit, Mich.

Everything in Sheet Metal for the Automobile

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EISEMANN

SIMPLE, accessible, durable and foolproof, the new Type EB Eisemann high tension system with separate transformer coil is making good with a vengeance.

Not only are the patented features of all Eisemann products present throughout the Type EB system but the specially designed breaker box used on the magneto has much to do with the splendid results credited to this instrument. It is the personification of simplicity and efficiency and is tested out at the enormous speed of 4,500 r. p. m.

An exclusive Eisemann feature which adds also to the value of this system is the coil and ratchet starter device which is used to create a shower of sparks from the battery while the motor is at rest, thereby enabling the starting of the motor "on the spark."

We should like to tell you more of this Eisemann product.

The Eisemann Magneto Company

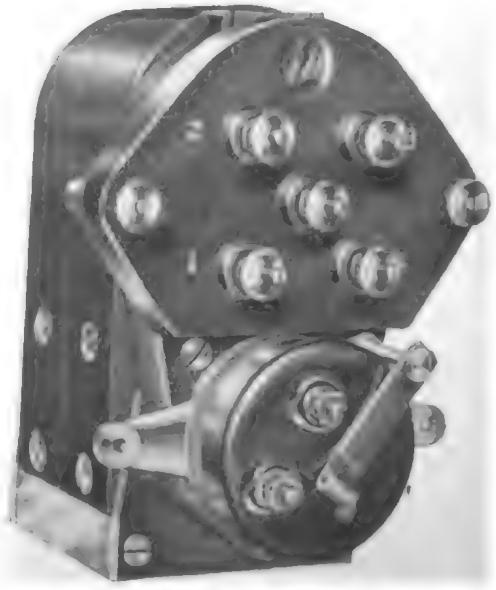
General and Sales Office:
225-227 West 57th Street, NEW YORK

INDIANAPOLIS, IND.
514 North Capitol Avenue

DETROIT, MICH.
802 Woodward Avenue

At the Boston Show a full line of Eisemann products will be exhibited by

THE EISNER-LENK COMPANY, Space 622, Dept. G



Type EB Magneto

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You Need This New Product—

It Heals Tire Cuts



The Motorist's Self-Vulcanizer

Unlike ordinary tire repair mastic

Fills the cuts and holes, solidifies quickly and becomes like a part of the tire. No car owner can afford to be without it. Reduce tire expense fifty per cent.

Use

NARCO TIRE CUT FILLER

Requires no Kneading

Very large tube one dollar.

a non-shrinking, rubber compound, heavy in rubber; a combination cement, cut filler and mastic. Refills and unites the torn place in the tire with a permanent plug of rubber more resilient than the tire itself. Welds the loosened tread to the canvas body. Supplied only in patent, collapsible tubes, with tapering spout.

Easy to Use

All you have to do is to clean the cut out thoroughly with gasoline, remove all oil, soot and other foreign matter, insert the tapering spout into the cut and compress the tube, smooth off the cut filler and the repair is complete. Allow it to heat over night, in the morning it will have become *like a part of the tire*. Rivets itself to the walls of the cut, forming a union so perfect no road abuse can remove it.

This is the logical manner of tire repair. Every automobile owner in America should make Tire Cut Filler a part of his repair outfit and begin using its cost now. Very large tube, $1.00. Money returned if not satisfied.



TIRENEW

waterproofs the outer rubber casing of the tires and penetrates down to the inner fabric, protecting it from oil, air and moisture. Preserves the tires and prevents decay. Spread it over the surface of your tires after mending with Tire Cut Filler. *Makes tires look like new.*

There are imitations which paint but don't protect—insist on Tirenew.

Narco Rubber Reviver and Refinisher

A reviver, refinisher and waterproofer for anything rubber or fabric. Make your auto tops like new.

Narco Triple-Strength, Non-Inflammable Rubber Cement

A rubber cement three times as strong as ordinary cement, and costs no more.

ALL GOOD DEALERS CARRY NARCO PRODUCTS OR WILL GET THEM FOR YOU

To Dealers—Write for the Narco catalog telling all about the complete line of Narco products and don't fail to ask for our trade proposition. We will give you complete information together with our catalog if you will write us mentioning your jobber's name.

NATIONAL RUBBER COMPANY

4413 PAPIN STREET, ST. LOUIS, MO.

National Rubber Co., 4413 Papin Street, St. Louis:
Gentlemen: Inclosed find $1.00 for which please send me prepaid a large tube of NARCO TIRE CUT FILLER. Also please send me ... Tirenew and your other Narco products.
Dealer's name
Jobber's name
Address
My Name
Address

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BOSTONS' NEW ENGLAND SHOW

"Boston State-House is the hub of the solar system. You couldn't pry that out of a Boston man if you had the tire of all creation straightened out for a crowbar."

The Autocrat of the Breakfast-Table.
Oliver Wendell Holmes.

SPRING FEVER

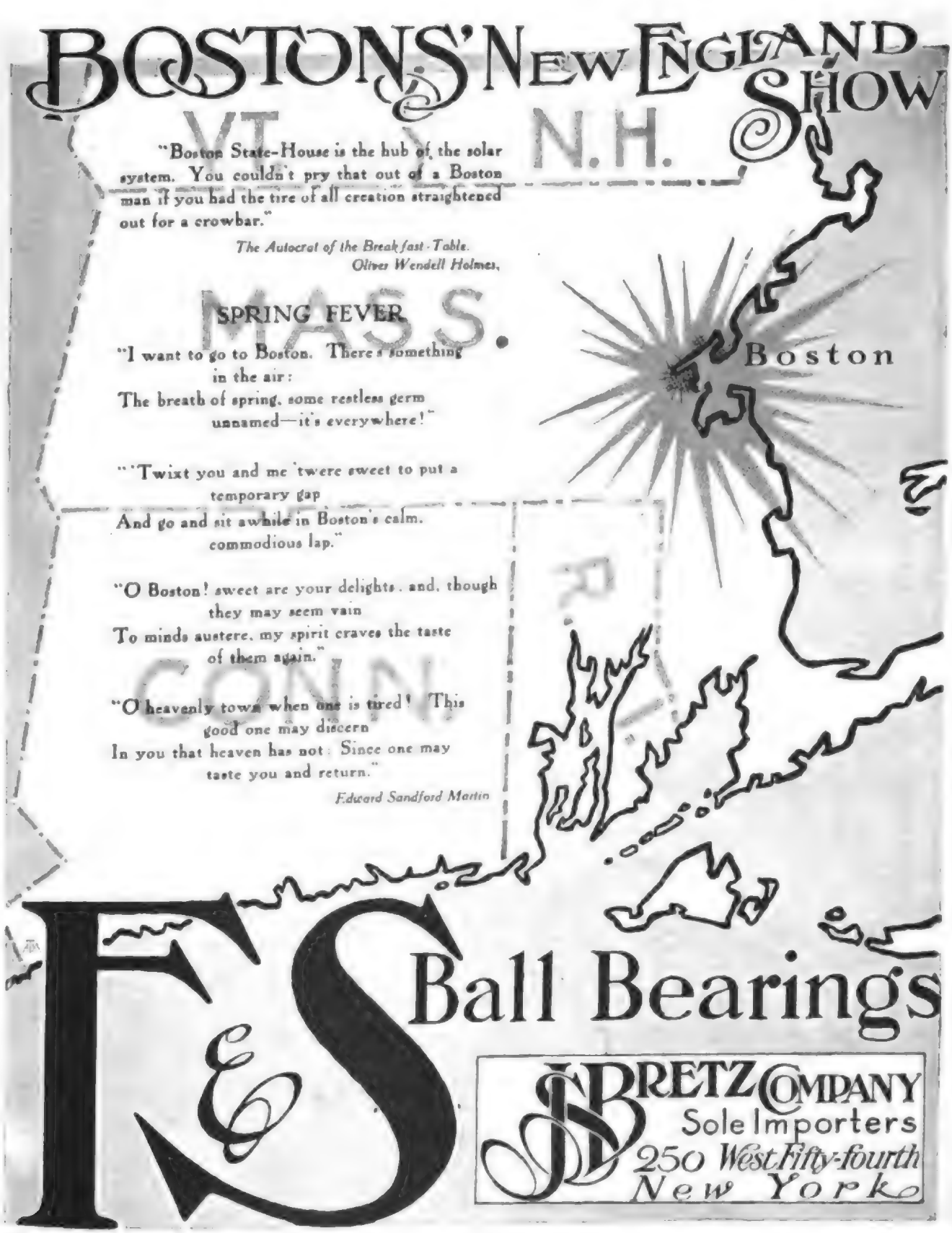
"I want to go to Boston. There's something in the air:
The breath of spring, some restless germ unnamed—it's everywhere!"

"'Twixt you and me 'twere sweet to put a temporary gap
And go and sit awhile in Boston's calm, commodious lap."

"O Boston! sweet are your delights, and, though they may seem vain
To minds austere, my spirit craves the taste of them again."

"O heavenly town when one is tired! This good one may discern
In you that heaven has not: Since one may taste you and return."

Edward Sandford Martin



F & S Ball Bearings

J. BRETZ COMPANY
Sole Importers
250 West Fifty-fourth
New York

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The Sheldon Steel Wheel performs a double function in truckdom. It positively eliminates the necessity of wheel replacement and it reduces tire wear to the minimum.

Destruction tests carried out in our factory showed conclusively that a pendulum blow which demolished a wooden wheel had little or no effect on the Sheldon Steel Wheel.

The Sheldon Steel Wheel is resilient. Its weight at the periphery is negligible. All frictional heat radiates quickly from the metal. These three points contain a message of vital importance to truck owners or manufacturers because they mean greater tire economy.

All the quality of design and workmanship that have made our springs and axles famous for their indestructibility will be found in this latest addition to the Sheldon line.

SHELDON AXLE CO.
WILKES-BARRE, PA.
CHICAGO BRANCH 48 East 23rd St.
DETROIT BRANCH 1711 Woodward Ave.



First---Race Contour

Look first to the contour of your ball bearing raceways—for the raceways are about the most important single feature of ball bearing construction. First must come the raceway of right contour, for just so far as you fall short of right contour by just so much do you fail to realize the full efficiency to which you are entitled.

It is the truth of this statement principally coupled with the fact that we are able to guarantee correct race contour, that accounts for the unequalled capacity and endurance of

Gurney Ball Bearings

This fact, while not obvious at a glance, can easily be shown, and we urge you to give us an opportunity to demonstrate our point by actual

However, there are four essentials to high ball bearing efficiency that are obvious as well as apparent at first sight, namely

Full Complement of Balls
Solid One-Piece Separator
Uninterrupted Raceways
Full Depth of Raceways to Resist Thrust

Now, mark this well—every bearing to give the utmost efficiency must combine all four of these essentials. The absence of any one means a sacrifice of either capacity or endurance—and yet Gurney Ball Bearings are the only bearings made which combine all of these obvious essentials—the only bearings made that, besides inherently possessing these four essentials, also possess raceways of the right contour.

GURNEY BALL BEARING COMPANY
JAMESTOWN, N. Y.

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WARD LEONARD

The WARD LEONARD SYSTEM has exerted a world-wide influence for good in electrical engineering as applied to motor cars.

Twenty-three years ago WARD LEONARD LIGHTING SYSTEMS were used as pioneer installations in the line of dynamo lighting systems for moving vehicles. In these systems the batteries were "floated on the line" and were "automatically controlled" just as is necessary in the case of motor cars.



A patent on the WARD LEONARD DYNAMO LIGHTING SYSTEM was filed in the United States patent office in 1905 and granted to H. Ward Leonard on November 5, 1912.

We were in the game early. We base our design on fundamental truths, and our system is unique in that it is particularly adapted to meet the working requirements imposed on electric lighting systems on motor cars.

The WARD LEONARD LIGHTING AND STARTING SYSTEMS of today are so made that they stand unchallenged upon their merits and meet unconditionally the most scientific criticism and the most severe service.

These systems lift electric lighting and starting out of the realm of experiment and make it a commercial reality.

Manufacturers who install WARD LEONARD LIGHTING AND STARTING SYSTEMS on their cars are making a wonderful service investment. They don't simply install apparatus. They add as selling arguments to their products, the best possible combination of the most desirable electric designs in permanent form.

The WARD LEONARD LIGHTING AND STARTING SYSTEM will be doing satisfactory service years after the names of many of the present makeshift systems have been forgotten.

WARD LEONARD ELECTRIC COMPANY

(113) BRONXVILLE, N. Y.

Lighting-Starting

598

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The New Jones Speedometer

A Non-Magnetic Speed Gauge of Modern Construction, the Accuracy of Which is Unaffected by Dynamos, Climate, Heat or Cold

What We Are Telling to 15,000,000 People

About Joseph W. Jones' Master Instrument—the New Jones Speedometer —in Double-Page Space in the World's Greatest Weekly Magazines.

Every owner of a motor car, sooner or later, will want to see the New Jones Speedometer before he equips his car. Don't you want to learn of this new instrument now.

The New Jones, being non-magnetic, is unaffected in any manner by the dynamos on modern cars, and is absolutely unimpaired by climate, heat or cold.

It is the latest, and **finest**, production of Mr. Joseph W. Jones—the inventor of the **first speedometer** ever used on an automobile, the **Disc Record** in use on most talking machines, the **Taximeter**, the **Autolog** (the **Recording** Speedometer), the Electric Horn for motor cars, and **forty-five other patented articles.**

Mr. Jones is the "Edison" of motor cars. And the New Jones is his greatest achievement, the finest instrument produced in the accessory line.

Some of the Other Features

Rigid Steadiness, an Unbreakable Shaft with the Jones Ball-Bearing Swivel Joint, Larger Speed and Mileage Figures, the Most Legible Speed Scale—a handsomer, easier Dial to read—are some of its other points of supremacy.

We Are Telling This, Too

We are telling of the award of first prize to the Jones in a list of fifteen American and foreign makes by the Royal Automobile Club of Great Britain and Ireland, the World's final authority on motor car matters.

We are telling of tests at Columbia University, Armour Institute and by the United States Bureau of Standards, where several rival speedometers showed inaccuracies at different temperatures of from 20 to 35 per cent—or 13 to 17 miles per hour. And how, in the same test, the Jones variations were almost imperceptible. These are facts we must tell because they're the truth as obtained by these **disinterested authorities.**

See The Saturday Evening Post, March 22nd, and Collier's, March 15th

See these double pages. We will insert one each month, for a year to come, in each of these great magazines, as well as other advertising. Every owner and maker of motor cars must feel this enormous influence—these reasonable arguments based on the facts. Every motor car user must know, in time, what the New Jones Speedometer means. We expect a demand for this instrument that was never before equaled by any speedometer. Its features and quality made known in this way, will force it into favor. That must be the inevitable result.

Learn, Too, of Jones Branch and Agency Service

Ask us about the Jones Organization and its ability to insure satisfaction to manufacturer and user. Ask about our Branch Houses and Agencies in all the principal cities of the World, in charge of the highest type of men, men with whom you will like to deal.

Ask about our few uncovered territories and the Jones Proposition for closing them up. See what it means to Join the Jones Family and handle the New Jones Speedometer—the finest thing of its kind ever made, the Last Word in speedometers. Don't contract for any speedometer until you see the New Jones. You cannot afford not to know about it.

Write "The Jones Speedometer" Today
Broadway at 76th Street, New York



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What We Pay for You

By R. E. Olds, Designer

Note what we do to save cost of upkeep with users of Reo the Fifth. To save repairs and troubles. To insure you an honest car.

Cost Us $200

These extra precautions, which some call extremes, cost us about $200 per car. I employ them because, in years to come, they save $500 per car.

I have proved this fact a myriad times in my 26 years of car building.

To merely sell cars, these things are unnecessary. But to hold users' good will—hold it year after year—these things must be done.

Our Extremes

Our steel is all made to formula. It is analyzed twice before using. That saves us countless mistakes.

Our gears are tested in a crushing machine to stand 75,000 pounds per tooth. Our springs are tested for 100,000 vibrations.

Each engine is tested for 48 hours. There are five long-continued tests.

There are fully one thousand tests and inspections applied to every car.

Overcapacity

I require in each driving part an overcapacity of not less than 50 per cent.

I use oversize tires—34 x 4—to cut your tire upkeep in two.

I use 15 roller bearings, which cost five times what the usual ball bearings cost. And, to avoid all flaws, we use 190 drop forgings, at twice the cost of steel castings.

I use a $75 magneto—

A doubly heated carburetor—

An expensive centrifugal pump—

14-inch brake drums—2-inch, seven-leaf springs—a 17-coated body.

And we limit out output to 50 cars daily, to insure accurate fitting, abundant tests. To make sure that each car is right.

Does It Pay

You know that it pays to get a car built like this if you've owned a car that wasn't. All the difference won't show at the start, of course, but in after years you'll see it.

Every dollar I spend in these extremes saves users from two to four dollars. That's why Reo the Fifth stands at the top of its class, after 60,000 of my cars have been used.

See in this car our new center control. Note the absence of levers. Both front doors are clear. Note that it has the left side drive, like the leading cars today.

Note the flush electric dash lights. Note the splendid finish. Let our dealer point out to you the countless small perfections. This is the climax of a lifetime of effort. See what it means to you.

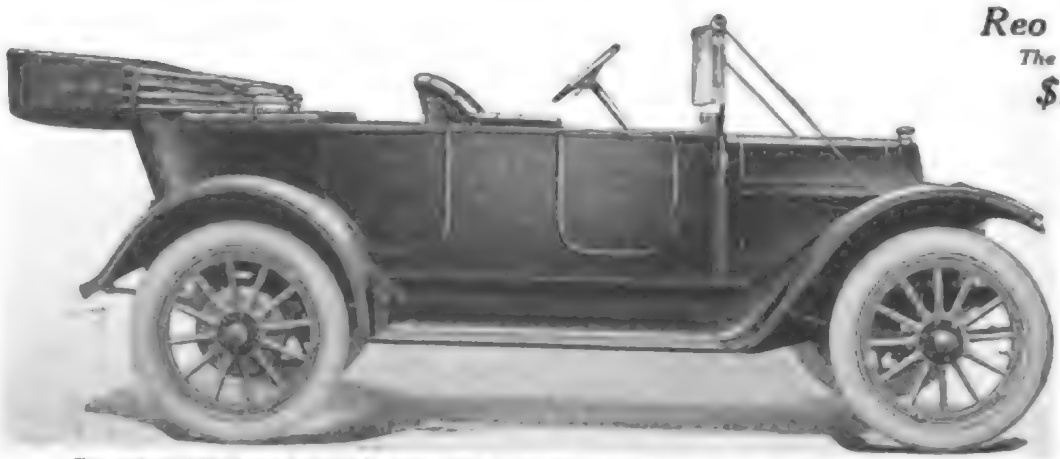
Write for our catalog and we will direct you to the nearest Reo showroom. They are everywhere.

R. M. Owen & Co., General Sales Agents for Reo Motor Car Co., Lansing, Mich.

Canadian Factory, St. Catharines, Ont.

Reo the Fifth
The 1913 Series
$1,095

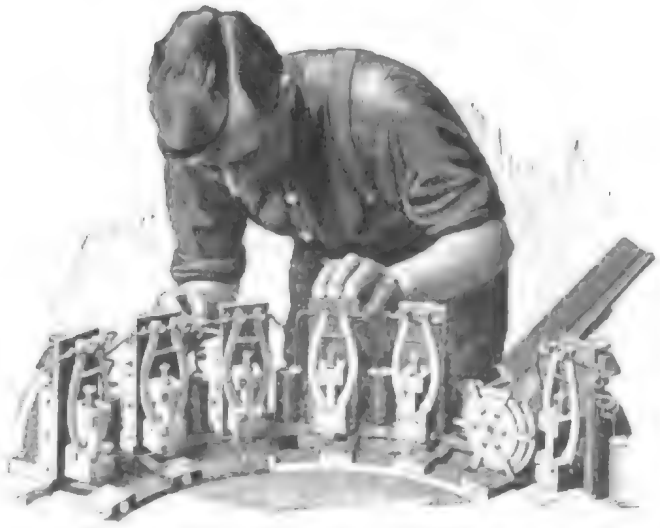
30-35 Horsepower
Wheel Base—112 inches
Tires—34 x 4 inches
Center Control
15 Roller Bearings
Demountable Rims
Three Electric Lights
190 Drop Forgings
Made with 5 an 2 Passenger Bodies



Top and windshield not included in price. We equip this car with mohair top, side curtains and slip cover, windshield, gas tank for headlights, speedometer, self-starter, extra rim and brackets—all for $100 extra (list price $170).

(155)

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Hunting the Quarter Thousandth of an Inch

No. 2 Setting the Sixteen Traps

¶ A quarter thousandth of an inch! A space but one-eighth the thickness of a human hair;

¶ Yet no one roller in a Timken Bearing can vary in size from its neighbors more than the quarter thousandth of an inch (.00025")

¶ Because, if that roller were 'high' it would stand extra strain and get extra wear; if it were 'low' it would loaf and throw its share of burden on its neighbors.

Timken Tapered



Roller Bearing

¶ The Timken automatic gauging machine—the machine of the sixteen traps—sorts the tapered rollers into a series of lots that vary by quarter thousandths of an inch. A machine for every size roller.

Traps Must Be Set Right

¶ Master rollers are used to set the traps. When each trap agrees to its master roller—and to no other—the machine is set right.

¶ The hardened and ground rollers now roll around the discof the gauging machine and each size springs the trap for which it was set.

¶ All day long the machine sorts the rollers and places them in canisters ready to be sealed until used in the Timken Bearing.

Traps Must Stay Right

¶ Perhaps after the traps were set some little thing has happened to disturb the fine adjustment of some one trap. Some one canister may contain a few rollers that are not just right. Timken accuracy demands the elimination of that chance.

¶ So every two hours each machine is stopped and each trap again tested by its master roller.

¶ If one trap is found wrong every roller that has passed through it must come out of its canister and again run the gauntlet of the sixteen traps.

Reason for the Quarter Thousandth

¶ The Timken Bearing has always been right in the principles of its design. In the earliest model cars it applied principles enabled it to give a service that no other bearing could give. This it did without the present day accuracy in manufacture.

¶ Year after year the hunt for the quarter-thousandth of an inch has added still longer life, smoother running, lower friction and the transmission of greater power.

The Timken Roller Bearing Company

Canton, Ohio, U. S. A.

The only axle manufacturer licensed to make automobile axles equipped with Timken Roller Bearings is the Timken-Detroit Axle Company.

219

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SOOT-

Our Message to Dealers

Mezger Soot Proof Spark Plugs, made by one of the oldest spark plug makers in the country, give positive and lasting insurance against plug troubles.

We have been making these plugs for ten years over protected patented design, from the best materials obtainable and through factory processes that must produce uniformly good plugs.



These plugs are Soot Proof—meaning that the commonest source of short circuit is, absolutely eliminated through the peculiar arrangement of the chamber, and because the plug actually burns its carbon as fast as formed.

Mezger Soot Proof Spark Plugs are gas-tight—a feature which again qualifies them to maintain their stand as leaders in the field.

The material used in their construction renders them indestructible through the action of violent heat and sudden change.

E. A. Mezger
"SOOT SPARK

Dealers who sell Mezger Soot Proof Spark Plugs have back of them our guarantee that these plugs must be permanently troubleless—permanently good and lasting—in fact, under all ordinary working conditions they will equal the life of the engine itself.

Now, this is the plug we ask you to sell, not only from a profitable standpoint but also through its ability to hold the good will of your trade and to make new customers—those who realize that in helping themselves out of their spark plug troubles, you are giving them service.

SPARK

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PROOF

Do not miss It's Import

The message on the preceding page is in itself enough to justify you to carry Mezger Soot Proof Spark Plugs in stock. Now consider our co-operative efforts in your behalf.

We are advertising Mezger Soot Proof Spark Plugs through the leading automobile publications to a group of car owners running into hundreds of thousands—many of them in your territory. This advertising tells at length the story we have told you briefly here. It is advertising that will lead customers to your counter.

C. A. Mezger
"PROOF" PLUGS

We realize that the best product in the world will not move easily and readily, unless the manufacturer backs his selling agents with conservative, strong, and helpful advertising.

We are doing this for you, and we are doing it so effectively, that you can ill afford to neglect this opportunity of handling the Mezger line.



We are creating the demand. We want you to be prepared to meet it. We want you to sell Mezger Soot Proof Spark Plugs. A pleased customer is your best advertisement, and every set of plugs you sell, bearing our trade mark, will go out and sell more of their kind.

Get into communication with us today, and we will send you full technical description of the Mezger Soot Proof Spark Plugs and quote you prices and commissions that will interest you to the point of action.

C. A. MEZGER, Inc., 15 Canal Place, New York

PLUGS

"Little Knox Six"

Commands Attention

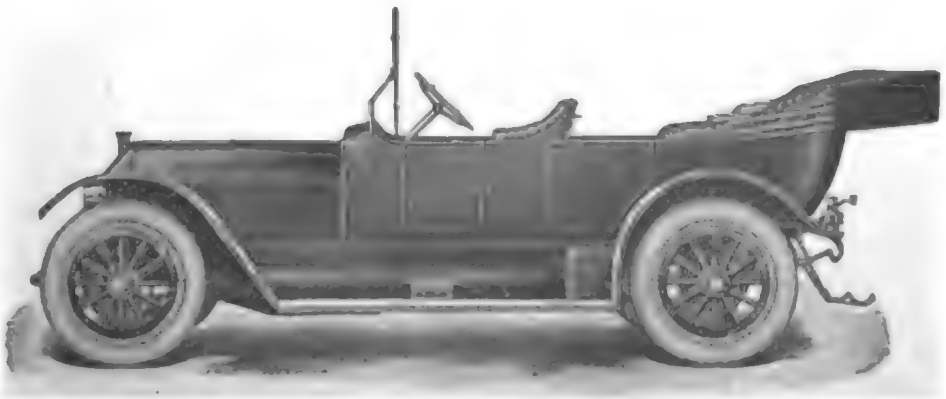
Arouses Enthusiasm

Silences Competition

Passes them all.

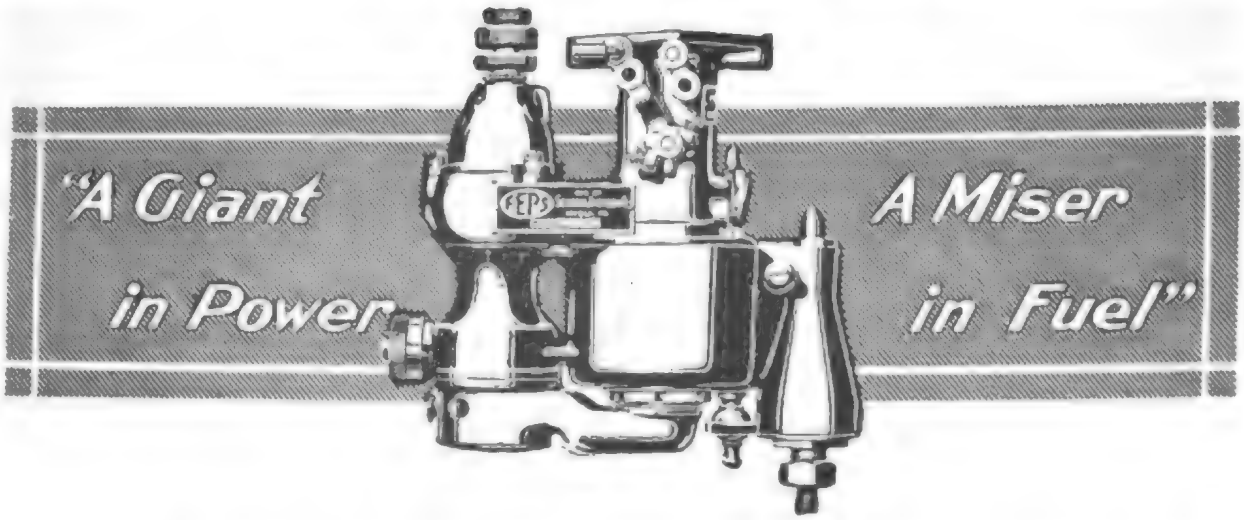
Made in New England

at Springfield, Massachusetts



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Every Reliable Accessory Dealer should have our attractive proposition on



The FEPS CARBURETOR

You've heard so much about wonderful carburetors that you're probably case-hardened in skepticism. We submit, however, these two series of facts for your consideration.

FIRST. The Carburetor is today the most imperfect part of the automobile, and far behind, in efficiency, every other accessory. There's real need of a real carburetor.

SECOND. The Feps Carburetor splendidly meets that need. It involves an entirely new principle of auxiliary air supply, producing a marvelous increase in flexibility; an absolutely perfect mixture at all speeds, with an increase of 25% to 50% in miles per gallon of fuel on any car. It contains no springs, no balls, no cams, no reeds, and all adjustments once made are permanent. It gives a perfect mixture with any grade of gasoline and is unaffected by altitude, weather conditions or change of temperature. It also embodies a never-failing quick-starting device.

The first fact you cannot dispute, the second you probably will, until you test out the Feps at *our* risk. Get in line with the Feps now for increased business and profit.

See the Feps at the Boston Show, Mechanics Bldg.—Space E-426

Write Dept. "F" for Descriptive Illustrated Booklet

Schoen-Jackson Company Media, Pa.

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THE ATWATER KENT SYSTEM

has been silently advertised from coast to coast by the best advertising anybody can have—the personal endorsement of over 100,000 satisfied users.

The Atwater Kent Ignition System has no rival—no competitor. We do not use this term metaphorically, but in a literal sense.

You may think this is the use of a trite advertising term, but in this case it is nothing of the kind. That the Atwater Kent has no rival in the opinions of thousands of users has been demonstrated to us many-many times, when in ordering their new cars they have specified that they should be "Atwater Kent equipped."



There are a number of other good reasons for the superiority of the Atwater Kent System over the magneto and it is worth your while as a jobber, dealer or prospective buyer, to weigh and consider them carefully.

Space forbids our mentioning these reasons even briefly, but if you will write for our booklet "D," we will give you some of them. Then ask the motorist who drives a car "Atwater Kent equipped" and he will tell you the others, and the best reasons why the Atwater Kent Ignition System has no real rival.

ATWATER KENT MFG. WORKS **4940 Stenton Avenue Philadelphia, Pa.**

DISTRIBUTORS

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is based on the fact that we have been handling the engraving of several prominent trade and general publications for years to the utmost satisfaction of both publishers and advertisers

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The quality of work turned out by this plant is re-inforced by our facilities for deliveries as promised. Your work will be put through with the same care and dispatch given to publishers whose work must be right—and "right on the dot."

WHITNEY

The Most Practical Chain for Motor Trucks

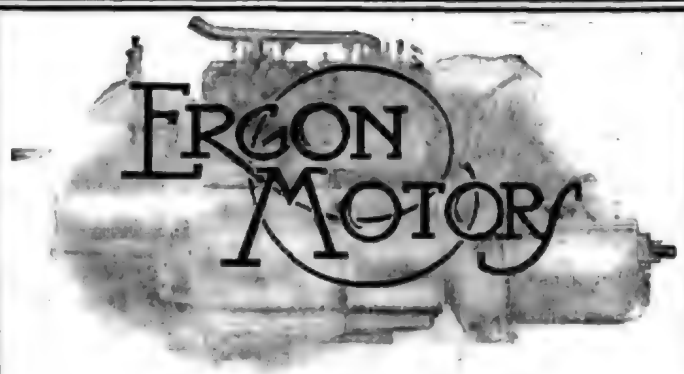
Because the "Whitney" Cotter Detachable Chain can be easily separated at any link and lengthened, shortened, or repaired without the use of any special tool. This is of great advantage to truck builders, owners and drivers.

"Whitney" Chains are used by the leaders because they are strong, accurate, dependable and above all long lived. They are made right and they're made from the right kind of material, thus giving highest efficiency. When making replacements insist on a "Whitney."

"Whitney" Chains Are Built for Strains

THE WHITNEY MFG. CO., Hartford, Conn.

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The crank shafts and connecting rods in ERGON MOTORS are made by the Driggs-Seabury Ordnance Corporation of Sharon, Pa. who have one of the largest and most finely equipped forging plants and machine shops in the United States.

The crank shafts have three bearings of genuine die cast babbitt. All bearings are adjustable and exceedingly accessible.

The connecting rods are made from a tough high grade alloy steel and the big end is provided with a genuine babbitt die cast bearing dowelled into the rod and cap.

The cup is so constructed and held in place that it is impossible for it to become loosened.

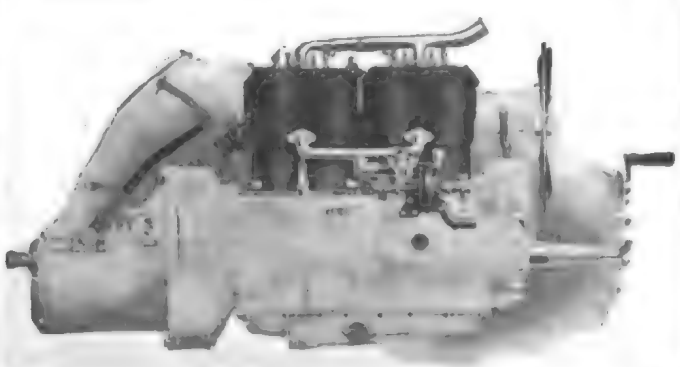
Brass shims take care of adjustments of these bearings.

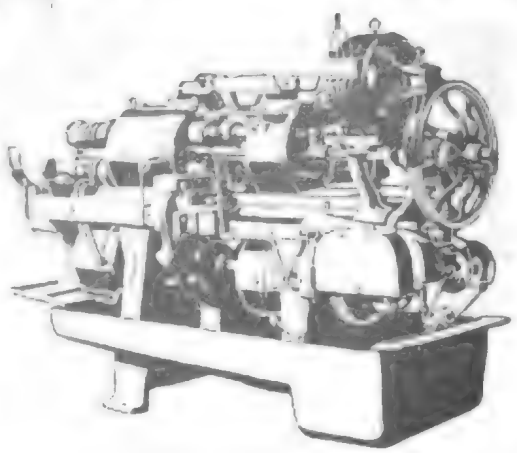
We stand ready and willing to demonstrate by a test that there is no superior to this new line of four cylinder, four cycle, long stroke, water cooled motor.

Please let us hear from you today with a definite statement of your wants.

HAZARD MOTOR MANUFACTURING CO.

Rochester, N. Y.





REHANDLING screw machine work often causes delays and congestion in your finishing room. A machine doing away with this condition will profit you greatly.

THE Acme Automatic in most cases turns out completed parts. The method of tooling enables you to perform as many as eight or ten operations at once. Comparatively few parts require more operations than this. Frequently it is cross-drilling or milling which necessitates rehandling when ordinary methods are used. The Acme Way is to do these operations on the machine while the other cuts are being made.

LET us tell you from our samples what the Acme will save you in rehandling. Send them in now.

The name of our booklet "Acme Method" explains its purpose. Ask us to send it.

The National-Acme Mfg. Co.

Automatic Screw Machines and Their Products

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CHICAGO 23 So. Jefferson St.
ATLANTA 3rd Natl. Bank Bldg.
MONTREAL In St. Henri at G. T. R.

FACTORIES Cleveland, Montreal
WAREHOUSES New York, Chicago

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Rust eats tires; rusty rims increase tire trouble and expense

Outside tire protectors save you from most tire troubles; not from one of the worst; iron rust.

You can see for yourself how these destructive rust flakes on your rims have rotted the rubber in your casings. That's not all they do. They "freeze" the tire to rim or to the bolts of your demountable; make tire changes much harder work.

You can prevent all this; you can keep the rims from rusting; make tire changes easier, save money, and trouble by painting your rims twice a season with

THOMAS' ANTI-RIM-RUST PAINT

This is a scientifically-compounded metallic paint, containing para rubber and graphite. Besides its wonderful usefulness in preventing destructive iron rust and making tire changes easier (especially when used on the rim bolts and lugs of motor trucks), it makes a lasting and efficient lubricant for spring leaves.

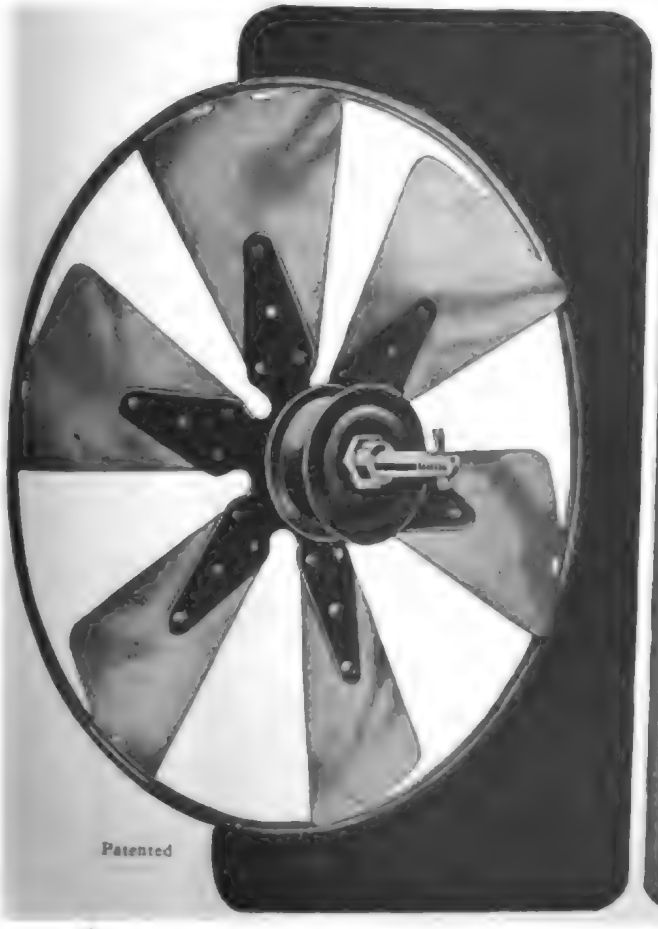
Get a can today from your dealer; if he is out of it, send one dollar to us; brings you full-sized can—enough for eight rims.

To Dealers

Thomas' Anti-Rim-Rust-Paint will be a fast-moving item in your stock; all car owners will ask for it. Discounts are extremely liberal. Drop us a line if your jobber can't supply you.

The Anti-Rust Paint Company

Akron, Ohio



Durability and Quietness

These points are having special attention in Sparks-Withington One Piece Blade Radiator Fans; further, we are now equipped to make 1,000 fans in 10 hours. Buy a proven out article and also save by using our standards. Get complete catalog.

THE SPARKS-WITHINGTON CO.

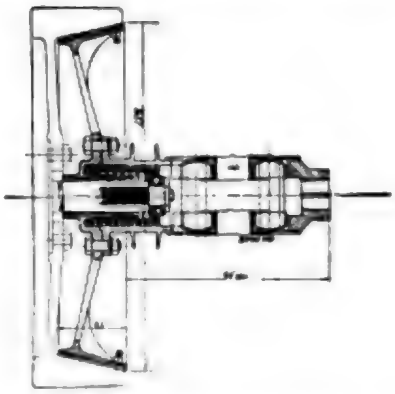
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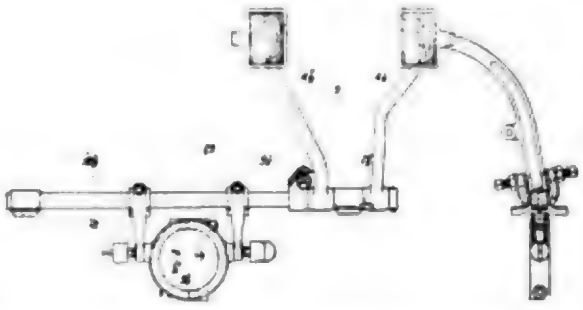
AUTO PARTS
1 or 1000

In the first instance we suggest our standard designs and can ship from stock.

In the second, will modify to suit your requirements and begin shipments in two weeks to thirty days. During the past five years, we have supplied parts for some of the best cars, and therefore have a broad experience in the manufacture of parts.



Cone clutch with double universals in sizes ranging from 30 to 60 H.P. Special features, easy engagement of cone and long life.



Pedal assembly with bronze or ball bearing throwout yoke, pedals of various styles to suit your requirements.

THE OTTO KONIGSLOW MFG. CO.
3510 Perkins Avenue
CLEVELAND, OHIO

KLINE KAR
"FORTY" $1985

The best four-cylinder forty horsepower car on the market with separate electric starting and lighting, and separate ignition systems. The economical four speed forward transmission is another big asset.

Address Dept. W for Catalog

KLINE MOTOR CAR CORPORATION
Richmond, Va. **York, Pa.**
Main Office and Factory, Richmond, Va.

Add $10 to $20 Profit to Each Automobile Sale

Here's an easy way to pick up an extra Ten or Twenty Dollar Bill whenever you sell an automobile.

Just send us the name of the purchaser and we will endeavor to sell him an Edwards Private Portable Steel Garage. That's all we want you to do—**merely furnish us the name.**

You Invest No Money or Time

It means $9.25 to $20 profit **FOR YOU** on each sale. And you've no money or time invested. Send us a list of all automobile owners in your locality, and on this plan you'll make a nice, clean profit—perhaps several hundred dollars.

The Edwards is far and away the most popular and widely advertised Private Garage. Our prices are much lower than others'. And we've an excellent system of following up all names received. We won't miss any opportunities to close sales.

Write Us Now Send us your list of local auto owners at once, or we will be glad to answer any questions.

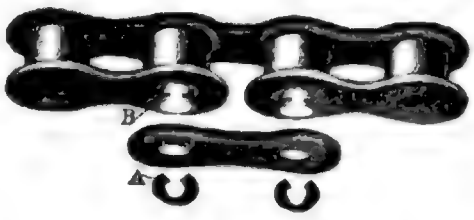


Edwards Fire-Proof Garage

An artistic, fire-proof steel structure for private use. Gives absolute protection from sneak thieves, joy riders, fire, lightning, accidents, carelessness, etc. Saves time, work, worry and trouble. Comes ready to set up. All parts cut and fitted. Simple, complete directions furnished. Absolutely rust-proof. Joints and seams permanently tight. Practically indestructible. Locks securely. Ample room for largest car and all equipment. Made by one of the largest makers of portable fire-proof buildings. Prompt, safe delivery and satisfaction guaranteed. (103)

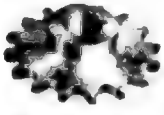
The Edwards Mfg. Co., 709-759 Eggleston Ave., Cincinnati, Ohio

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Both detachable and riveted, are used by the largest most exacting users of chains for automobiles in the world. They need no further recommendation.



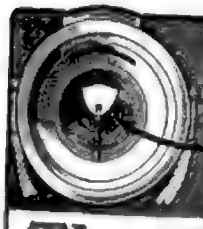
SPROCKETS We are equipped to make sprockets in large quantities at interesting prices, and make a specialty of carrying in stock, and furnishing sprockets for replacement on all standard commercial cars.

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The flame is always just this high when you use

The Prest-O-Lite Automatic Reducing Valve

With this device attached to your Prest-O-Lite, you do not have to turn the tank valve up or down to get the correct flame in the lamps.

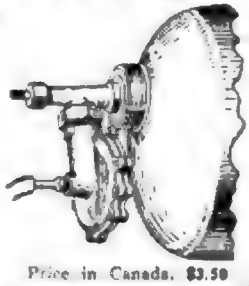
Turn on the gas, light your lamps, and the flame is bound to be just right, without any adjusting.

It pays for itself in gas saved, so its convenience costs you nothing.

Unlike other reducing valves, the Prest-O-Lite Automatic gives the correct gas pressure at all times, whether the tank is full, half full, or nearly empty. It is truly automatic in its action. **Price $3.00**

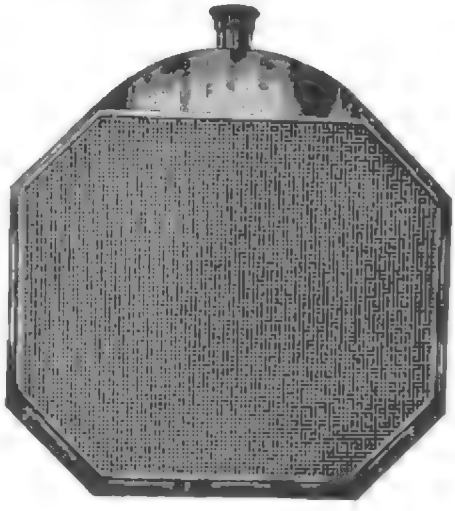
Anyone can attach it in less than five minutes.

Your dealer has it or will quickly get it for you. If not, we'll send it to you on receipt of price. Try your dealer first. Every Prest-O-Lite Branch Office has this Automatic Reducing Valve in stock.



The Prest-O-Lite Co.
287 E. South St. Indianapolis, Ind.
Canadian Office and Factory, Hamilton, Ont.

Price in Canada, $3.50



Our departments of engineering and design co-operate with the men who build the car—combining their weight of experience in radiator making with the particular requirements of the designer of the automobile.

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Mayo Radiators are built to hold the engine at an even temperature—not too hot to endanger its usefulness, nor too cool to lose its efficiency. "Tolerance" in change of design is therefore liberal—but it has its limits.

If you, as the man who has sold the car, find yourself in "hot water" so to speak, with a leaky, inefficient radiator and a "superheated" customer, then be sure this car was not equipped with a Mayo Radiator. Dealers who sell cars Mayo equipped know that the radiators will stand up under any unfavorable condition short of a blow with a hammer or a bad collision.

Mayo Radiator Co.

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The manufacture of this part requires—

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Send blue prints for quotation.

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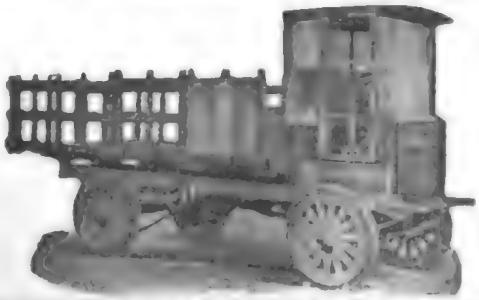
New York, N. Y.; Boston, Mass.; Philadelphia, Pa.; Chicago, Ill.; St. Louis, Mo.; Minneapolis, Minn.; Detroit, Mich.; Kansas City, Mo.; Dallas, Texas; Pittsburgh, Pa.; Omaha, Neb.; Des Moines, Ia.; Atlanta, Ga.; Charlotte, N. C.; Indianapolis, Ind.; Denver, Colo.; San Francisco, Cal.; Los Angeles, Cal.; Portland, Ore.; Memphis, Tenn.

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ONE, TWO AND THREE TON CAPACITY



LAUTH-JUERGENS TRUCKS ARE THE LATEST IN CONSTRUCtion, most powerful in operation and the motors are guaranteed against defective workmanship and material for the life of the truck. They are positively the highest class trucks made. Two cylinder, one-ton four cylinder, one, two and three-ton. Four speeds forward. Hess-Bright ball bearing transmissions made in our own shops of the finest tool steel, three-piece disc clutch, covered by patents owned by us. Send for 1912 Catalog and specifications. Prompt delivery on all models. Large publicity campaign just begun. Our quality will do the rest.

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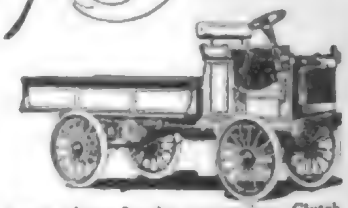
The Lauth-Juergens Motor Car Co., Fremont, Ohio.

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BOSTON—David Abrams, 131 Portland St.
NEW YORK—West Side Garage & Motor Co., 160-162 101st St.
CHICAGO—The Lauth-Juergens Motor Car Co., 2630-32 Wabash Ave.
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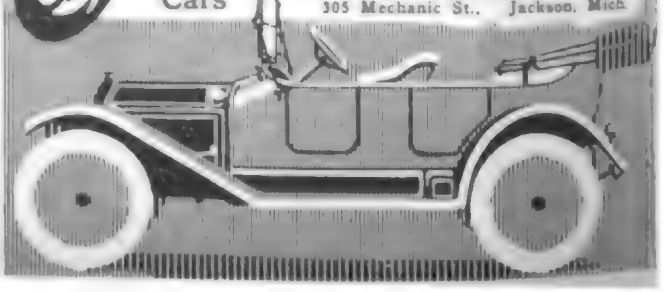
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60-6 six-cylinder, fully equipped with electric starter and lights $2750
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The same chassis is used for both models.

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Built for 24-hour a Day Service

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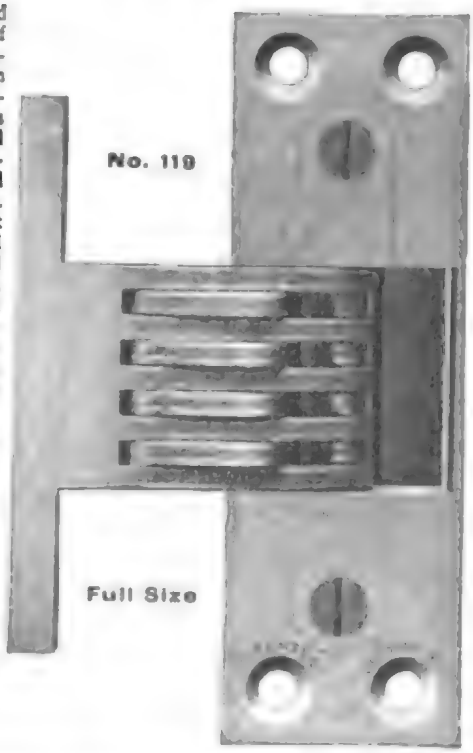
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There are more than 220,000 Fords on the world's highways—the best possible testimony to their unexcelled worth. Prices—runabout $525—touring car $600—town car $800 f. o. b. Detroit with complete equipment. Catalogue from Ford Motor Company, Detroit, Mich.

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The Reasons for Jencick Quality and Jencick Prices are worth knowing.

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For Motor Trucks

from base to spark plug, have features that are "Different and Better."

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Every part built in the KisselKar plant, which is equipped with every facility for economical manufacture. All KisselKars have extra liberal wheelbase and roomy tonneaus unsurpassed by any car at any price for comfort and capabilities. Write for catalog.

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"Thirty"
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60 H.P. "Six"

KisselKar prices include full equipment—self-starter, top, windshield, demountable rims, speedometer, electric lighting equipment, shock absorbers, etc.



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All charges for repair work are based on actual time consumed. Our work is absolutely guaranteed.

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If you will send in your old radiator, we will be glad to give you an estimate either on repairing it, or on rebuilding it with a Livingston core of patented tubes, or on building a complete new radiator.

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OAKLAND MOTOR CAR CO.
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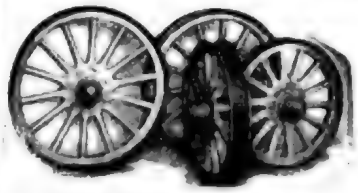
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$1000. to $3000.
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WHEN attending the coming Boston Automobile Show do not fail to visit Space 220, Basement, and see the new **6-CYLINDER K-D SLIDING CRESCENT VALVE MOTOR** on exhibition by the

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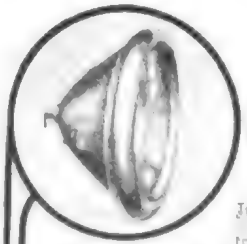
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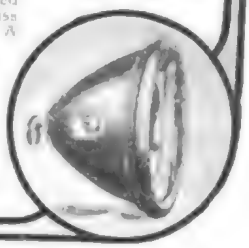
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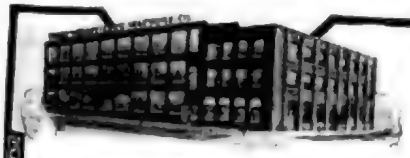
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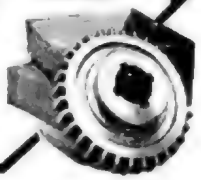
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The lining that makes your brakes dependable, and your car safer.

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We also make Duplex and Raymond Brakes and Gyrex the Mixer.



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We offer an especially liberal proposition to dealers. Write us.

STAVER CARRIAGE COMPANY
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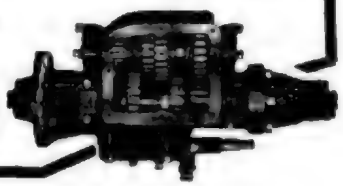
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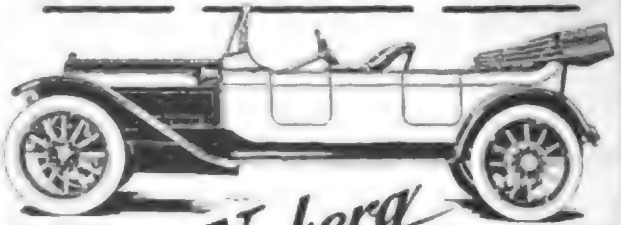
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Complete Equipment

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WRITE TODAY for **Cole Blue Book** and dealer's proposition.

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Model 29—Runabout -	$2600	2000 Lb. Chassis -	$2200
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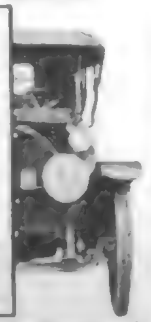
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The Marmon "32"	*The Marmon "48"*
Four cylinders, 32-40 h.p., 120-inch wheelbase, electric starting and lighting system, left-hand drive, center control, nickel trimmings, with newest body types to meet every requirement and corresponding equipment—	Six cylinders, 48-60 h.p., 143-inch wheelbase, electric starting and lighting system, left-hand drive, center control, nickel trimmings, with body types to meet every requirement and corresponding equipment—
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BUDA MOTOR

We're 25 years old now and you can rest assured there will never be any "out of business" sign up when you want that interchangeable part.



Model "T"

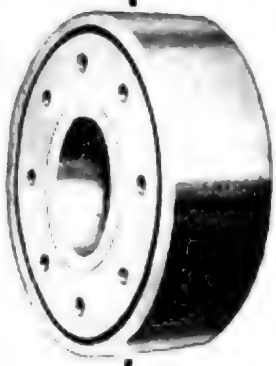
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cost very little more than castings. They are vastly superior and less expensive in the end.

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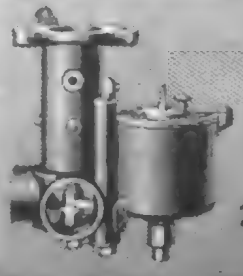
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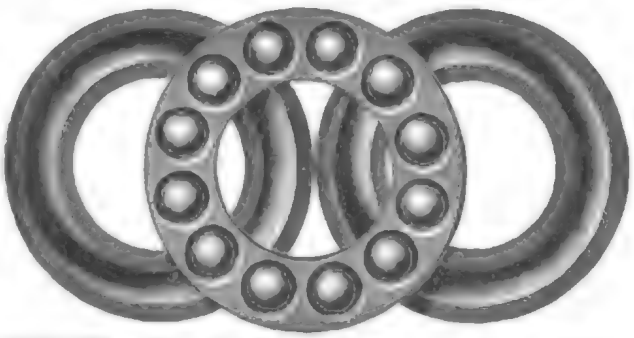


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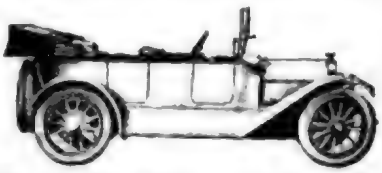
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The unrestricted and absolute sale by public auction of the entire plant (less real estate) of

THE E. R. THOMAS MOTOR CAR COMPANY

At Buffalo, New York,

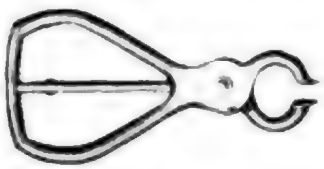
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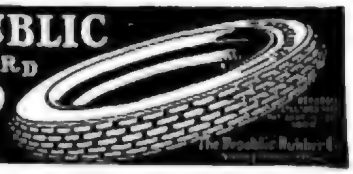
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The unrestricted and absolute sale by public auction of the entire plant (less real estate) of

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At Buffalo, New York,

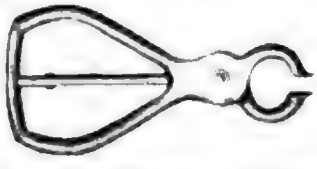
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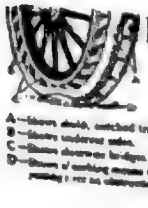
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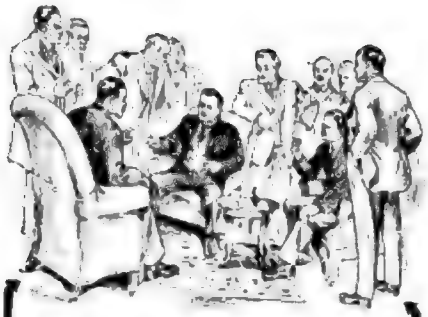


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Weed Chains

In one of those friendly after-luncheon, get-together parties at a well known city club, eleven men drifted on to *the subject of the dangers of skidding.* With a single exception each of the eleven owned an automobile, and each had a *skidding experience* to relate, and each felt that *his particular predicament* was the most sensational and startling.

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Insure perfect control and safe, comfortable driving

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Weed Chains are an absolute necessity on both rear tires and to doubly guard yourself against accidents and to make steering comfortable and easy, put them *on the front wheels too.* They cannot injure tires because "they creep"—occupy very little space when not in use—applied in a moment without the use of a jack or other tool.

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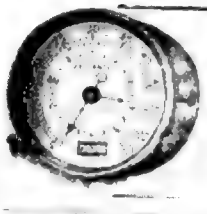
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Here is an accessory that will not stay on the shelf. It sells on sight.

MARVEL STEAM VULCANIZER

Automatic, therefore safe for rubber. Uses alcohol or gasoline. Low priced. Send for sales plan and sample Vulcanizer.

THE MARVEL AUTOMOBILE SUPPLY CO., 710 Hollister Bl., Cleveland, O.



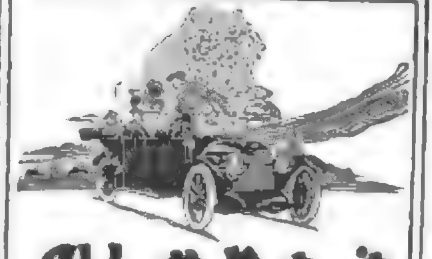
These Tires for You

Four corps of experts working in four of the best equipped tire plants in the world are operating as a unit to produce

UNITED STATES TIRES

Nothing of the kind has ever before been attempted in automobile tire manufacturing.

United States Tire Company
New York



Abbott-Detroit

"The demand of the day is that an organization shall be judged by its product and not by what it claims for itself" Keep this in mind when you examine these 1913 models

MODELS AND PRICES

[illegible]	[illegible]	$1700
34-40	5-passenger, Fore-Door Touring Car 116-inch wheelbase	$1700
44-50	5-passenger, Fore-Door Detail-Tonneau 121-inch wheelbase	$1975
44-50	7-passenger, Fore-Door Touring Car [illegible]	$2000
44-50	Speedster Roadster, 121-inch wheelbase	$2150
44-50	7-passenger, Fore-Door [illegible] 121-inch wheelbase	$2050

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ABBOTT MOTOR CO.
[illegible] DETROIT, MICH.

NATIONAL Compound Mixer and Primer

makes any car start easier in cold weather; adds 10 to 40% to power and mileage. Simple, easily installed, guaranteed effective on any motor. Get details and price.

NATIONAL MANUFACTURING CO., Kalamazoo, Mich.

The Ford Water Circulator

forces the water from radiator through cylinder water jacket, maintaining rapid circulation when car is in motion. Write for descriptive matter if you handle Ford cars.

THE FULTON-McCUTCHAN CO.
1146 Michigan Ave. CHICAGO, ILL.

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DIAMOND TRUCK CHAINS

The life of a chain is largely dependent on the strength and durability of its rivets; for the rivets receive more wear than any other individual part of the chain.

For this reason Diamond Truck Chains have Nickel Steel Rivets exclusively, and all holes in side bars are Reamed to exact size and pitch. This gives rivet shoulders an even bearing throughout the entire thickness of side bars—a result not possible with the customary punched hole.

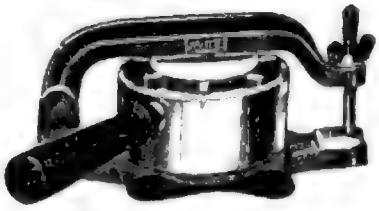
If you want chains that have the ability to withstand hard, continuous, day after day service, have your trucks equipped with Diamond Chains.

Our treatise "Power Chains and Sprockets" is a valuable book of reference on chain drives. Write today for a copy.

LOOK FOR THIS
TRADE ◇ MARK
ON EVERY LINK

DIAMOND CHAIN AND MFG. CO.
150 West Georgia St. Indianapolis, Ind.

Capacity 8,000,000 Feet Per Year



DEALERS: A million motorists will have tire trouble in 1913. There is a demand for a **reliable,** inexpensive vulcanizer that can be used by anyone, anywhere—a vulcanizer that will mend tube punctures as perfectly as the most elaborate plant.

VUL CANIZER REPAIR KIT $2

The only inexpensive vulcanizer that actually **vulcanizes** a repair clear through because it is the only one in which the vulcanizing temperature is maintained long enough to cure the raw rubber. Its ever-present fuel, gasoline, is converted into a gas by the patent generator which distributes the flame over the vulcanizing surface at just the right intensity.

Other exclusive Shaler features are a handle that is cool enough to permit moving the vulcanizer the moment the repair is finished, asbestos plate inlaid in tube shelf to retain heat and prevent pinching tube, and universal clamp insuring even pressure to all parts of a repair.

A real SHALER Vulcanizer

Not an experiment, but the product of the largest exclusive vulcanizer manufacturers in the world. Sold under the Shaler guarantee which has made the Shaler line of vulcanizers for motorists and repairmen the standard throughout the auto industry.

Get our trade proposition

Write today and get full details and trade prices on this indispensable accessory. Sooner or later every motorist will get a VUL-KIT from someone.

C. A. Shaler Co.
409 10th St. Waupun, Wis.

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For Sale—Wants—Exchange

15 cents per line of six words, cash with order.
— In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

SALESMAN WANTED by a concern making electrical goods and auto specialties of high grade and strong selling features. To the right man making investment a good interest and good salary will be given. Capital required one to $5,000.00. Rare opportunity. BOX 248, care Motor World.

APPLY Boyer's Automatic Refinisher to your automobile today. Tomorrow it will look as though it just came from the factory. Finest thing in the world for dull hoods. Easily applied with cheesecloth. Particulars free. BOYER CHEMICAL LABORATORY CO., State and Michigan Sts., Chicago, Ill.

MAILING LISTS AND STATISTICS.
Owners or dealers; any state, county, city; weekly and monthly supplements at lowest prices. Special lists of Electrics, Trucks, Fords, Studebakers, Overlands, etc.
MOTOR LIST CO. OF AMERICA.
230 News Arcade, Des Moines, Iowa.

PEERLESS AUTO TOP DRESSING.
For mohair, duck and canvas automobile tops and curtains. Waterproofs leaking tops. Makes old tops a uniform color. Ask your dealer.
The Columbus Varnish Co., Columbus, O.

FOR SALE—Five passenger automobile phaeton body, costing originally $1,100; no doors in front; built for Berliet car; top and windshield complete; used less than 200 miles; now in storage. Write PERRY, 17 East 55th St., New York City. No reasonable offer refused.

WANTED—Rectifier, two-twenty volts; prefer General Electric. NIC. N. STEFFES, Winona, Minn.

MORA REPAIR PARTS—We have purchased the repair business of the Mora Cars, including all stock on hand, drawings, patterns, jigs, office records and the right to receive the mail of the company. Owners of Mora Cars will save considerable time by placing their orders for parts directly with us. We have in stock repair parts for all models. PHILADELPHIA MACHINE WORKS, 67 Laurel St., Philadelphia, Pa.

$1500 will purchase five-ton Couple Gear Electric Truck, recently overhauled and in fine shape. All tires in perfect condition recently applied. KNOWLTON WAREHOUSE CO., Buffalo, N. Y.

ONE-TON Delivery Truck, in first-class running order; pneumatic tires, two extra shoes, chains, shields, insurance, etc. Having no use for same must be sold at once; no reasonable offer refused. Will give thorough demonstration. LINWOOD HAINES LIMITED, Front and Federal Sts., Camden, N. J.

FOR SALE—Brush car, in good running order, complete, with top, extra tire and full equipment of tools; at a bargain. Address P. JONAS, 780 Delaware Ave., Milwaukee, Wis.

PLANT FOR SALE CHEAP—Suitable for auto bodies (especially limousine) and accessories. Power, lights, water, dry kilns, sprinklers, sidetracks, abundant storage. A. J. PHILLIPS CO., Fenton, Mich.

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For leather, rubber and pantasote tops and curtains. Softens the top and renews the finish. Ask your dealer.
The Columbus Varnish Co., Columbus, O.

TO EXCHANGE—Mitchell Model G and lot in thriving town of Ashdown, Ark., for Buick roadster, 1911 or 1912 model, or other make as good. Address LOCK BOX 583, Pittsfield, Ill.

$400 BUYS, COST $1,000
Atterbury truck, 1912, half ton, panel top, hard tires, chain drive; sold because owner bought larger capacity. DUKE, 57 East 108th St., New York.

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WELDING—Cylinder crank case and crank shaft welded, cylinders rebored, $7.00 to $11.00 a cylinder, including piston and rings. STERLING ENG. CO., 331-333 S. Clinton St., Chicago, Ill.

PEERLESS LINING DYE.
Fod dyeing the inside of all cloth tops and curtains. Makes faded, stained and grease spotted lining a black uniform color. Ask your dealer.
The Columbus Varnish Co., Columbus, O.

SIMPLEX 90, with touring and racing equipment in A1 condition. Cost $7,500. For sale, $2,000. J. A. FORSYTHE, JR., 350 E. Forsythe St., Jacksonville, Fla.

FOR SALE—Garage, equipment and business at Hobart, Okla., county seat of 5,000, two railroads, prosperous and growing agricultural section surrounding. Weather and roads such that everybody uses the auto the year round. No tie up for snow and ice. Come or write. D. A. SCOTT, Hobart, Okla.

FORD Model T Reference Book" gives cause and cure of all the ails of Model T simply and concise. Gives the latest kinks. Full of pointers. Written especially for it. Elaborate cross index enables you to discover any trouble at once. Write for descriptive circular or sent postpaid, $1.00. FORD REFERENCE BOOK CO., 57 West 125th St., New York.

AUTO LISTS, owners, etc., of any State. S. H. CARROLL, JR., Albany, N. Y.



An ad. like this will cost you 75c. for each insertion.

These columns offer you an opportunity to appeal to an audience of 8,000 readers whose merchandising taste is being cultivated

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For Sale—Wants—Exchange

15 cents per line of six words, cash with order. — In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

LOT in Velasco, Texas, for automobile or motor boat; paid $1,000 20 years ago. TOM CHILDRESS, R. F. D. No. 2, Arlington, Texas.

FACTORIES ATTENTION!!!
We are in the market for excess stock of complete cars; chassis; bodies; engines; magnetos; accessories, etc.
PEETS-HOMAN CORPORATION
239-241 West 56th St., New York City.

ALUMINUM vulcanizers for both casings and tubes. $3.50 prepaid to any address. Money back if not satisfactory. TRUSCOTT SUPPLY CO., St. Joseph, Mich.

RURAL Parcels Post Delivery Car—Any party with capital and push interested in placing one on the market, correspond with E. P. COWLS, Sparta, Mich.

AUTO LEGAL MATTERS
Have you a troublesome chattel mortgage, bad insurance, or disadvantageous contract, bad debts you want to collect? Do you want to borrow money, or need expert legal advice? I specialize in automobile law. Charges nominal. EDWARD ENDELMAN, Attorney at Law, 299 Broadway, Manhattan, N. Y. C.

FORD OWNERS—Our spare demountable wheel cures tire trouble on the road. Attention, Doctors. Write. ANGIER'S, Streator, Ill.

AUTOMOBILE CYLINDERS reground, new pistons and rings fitted. Garage air compressors. CAST IRON BRAZING CO., Manchester, N. H.

WANTED—Salesman for agencies in every city to install new process in demand, showing over 300% profit to garages, supply dealers, breweries. Entirely new, big seller. This means big money. Experience not essential. H. J. WEBER, South Orange, N. J.

FOR SALE OR LEASE—The most modern garage in Southern Colorado, with fine repair shop and storage room for sixteen cars, doing good business and fine prospects for coming year. A snap for someone. Address BOX 208, Monte Vista, Colo.

FOR SALE—Cheap, one American Traveler, color battleship gray; just like new; run a little over 4,305 miles. MICHIGAN AUTO CO., 410 7th St., Calumet, Mich.

CADILLAC 1911,
$675—5-passenger; top, windshield, slip covers, Prest-O, speedometer, extra shoes and tubes; entirely new; any demonstration. DUKE, 57 East 108th St., New York.

ARE YOU in need of any additional help in any department of your business? Are you out of employment or looking for a better connection? Have you second-hand apparatus of any kind or do you want to buy second-hand material. Have you a factory site for sale or do you want to buy one? If so, use the Want and For Sale column of the Motor World. Seven words to the line, fifteen cents a line. Advertisements can be inserted over a number when it is desired and identity of the advertiser will be kept confidential.

BROKEN Cylinders and Crankcases—Send them to be made good as new at fraction of replacement cost. Scored cylinder repaired, $12. No new piston and rings required because bore is not enlarged. Where cylinders are worn (not scored from loose wrist pin) reboring is only remedy. We do it expertly. Write for complete information and estimates. WATERBURY WELDING COMPANY, Waterbury, Conn.

WANTED—A first-class man to take the agency for the latest invention on the market, a rubber cover for automobile handles called Steerease; write for full particulars. Address DEPARTMENT E, GOODYEAR RUBBER HOSE AND PACKING CO., 221 Chestnut St., Philadelphia, Pa.

BROKEN CRANKSHAFTS, cylinders, crankcases, flywheels, gear teeth, pistons, perfectly welded and machined ready to replace. Guaranteed and references. Machinery up to 5 tons welded. ATLAS WELDING WORKS, 74-76-78 Irving St., Rahway, N. J.

FOR HIRE—White 1½-ton truck by week. CHAS. HONEHEIN, 2027 3rd Ave., New York City.

KEROSENE FOR AUTOMOBILES.
New Model B uses successfully half and half mixture lowest grades kerosene and gasolene. Satisfaction guaranteed or money refunded. Greatly increased power, very slow speed on high. Starts easy at zero. Special agents' prices. Dept. 8. THE AIR-FRICTION CARBURETOR CO., Dayton, Ohio.

DETECTIVES WANTED—Young men wanted to operate in own locality, secret service work, experience unnecessary. Enclose stamp for particulars. UNIVERSAL DETECTIVE AGENCY, 304 Colcord Bldg., Oklahoma City, Okla.

FOR SALE—Garage, fully equipped, within 50 miles of New York City. Two-story brick building, steam heat, 1,000-gal. gas tank, full stock of oils, greases, supplies and accessories. Agency for two standard non-competing cars. Storage for 35 cars. This is a rare chance for a live man. Ill health of owner reason for selling. Address Motor World, Box 241

CYLINDERS reground. Pistons fitted. Prompt shipments. HAUBER AUTOMOBILE WORKS, St. Marys, Pa.

weekly to the highest degree by our articles on "Wide Awake Merchandising." Look at the cost as shown in the margins.

An ad. like this will cost you 90c. for each insertion.

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THE HESS-BRIGHT MANUFACTURING COMPANY

Pioneers in the Introduction of Annular Ball Bearings

Most extensive Resources and Plants in existence exclusively for Ball Bearing manufacture.

Enlarging and improving facilities—product and capacity for distribution.

Main Offices and Plant No. 2:

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Philadelphia, Penna.

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THIS LIST of 49 cars represents the aristocracy of motordom. Read it over. How many high-grade cars do you fail to find?

Select any one and you buy a car Klaxon-equipped;—one that the maker intends shall be *completely ready*—for your comfort, safety, satisfaction.

You buy a car equipped with a signal that is the out-and-out choice of over 150,000 motorists; that is *necessary* to public safety; and that fully meets the measure of efficiency laid down by all signal laws and ordinances.

The concerted action of the high-grade car manufacturers of this country and Europe is the final stamp of disapproval upon the out-of-date, inadequate bulb-horn.



KLAXONET

Lovell-McConnell Mfg Company Newark, N.J., U.S.A.

KLAXON

"The Public Safety Signal"



KLAXON

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Studebaker

Saleability Is Built Right Into the Studebaker "35"

What makes for saleability in a car?

Many things—but first in importance in a buyer's mind—is its Value.

The Studebaker "35" is the most remarkable value ever offered at $1290.

It's an epoch-making car—marking the arrival of the period when $1290 will buy every feature of comfort, luxury, reliability and endurance.

Not in one single detail does the "35" suffer by comparison with cars costing $2000 and more.

It's electrically started by simply pulling a handle on the steering column and electrically lighted by pressing a button.

It's a car of long, rakish lines—an aristocrat in beauty as well as in performance.

It's a car of comfort with resilient, easy riding springs, deep sumptuous upholstery and a wheel base of 116 inches.

It's a car of adaptability—seating four or six, as the occasion demands, and riding with luxurious ease, whatever the load.

It's a car of strength—of sturdiness—of reliability—a car for long, hard, unrelenting service every day in the year, for years.

It's a car built by Studebaker, and that means it's a good car "clear through." It's the utmost car value for $1290—and a big business builder for Studebaker dealers.

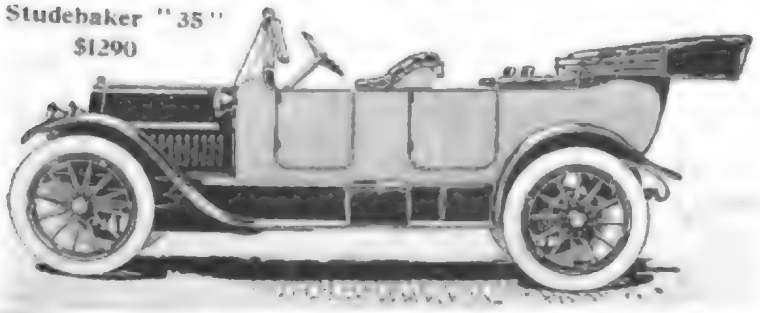
STUDEBAKER CARS

"20" Delivery Car....$825	"35" Touring Car...$1290	"SIX" Touring Car.$1550
"25" Roadster 885	"35" Sedan Type.... 2050	"SIX" Limousine .. 2500
"25" Touring Car.... 885	"35" Coupe 1850	

All prices for cars fully equipped F. O. B. Detroit

The Studebaker Corporation
DETROIT, MICH.

Studebaker "35"
$1290



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MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXXIV
No. 12

New York, March 13, 1913

Ten cents a copy
Two dollars a year

The ELECTRIC DISCO System
STARTING—LIGHTING

A *Sure* Start; a *Quick* Start
No Waiting

If your car is Electric Disco equipped, you won't have to wait and wonder how long you'll be getting started. Just press the button and away you go—at ONCE.

That's because the Electric Disco SPINS the motor.

It doesn't merely turn over your engine or crank it. It sets it spinning at 120 to 150 revolutions per minute.

Simplicity Itself

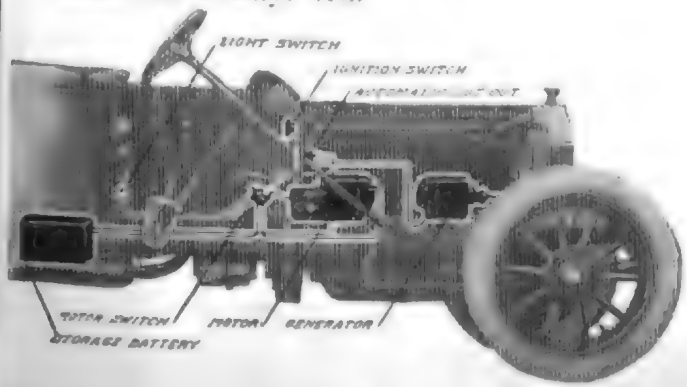
Yet the Electric Disco is marvelously simple.

No instructions are sent save these:

"To Start Car, Press the Button;
To Light Car, Turn the Switch."

Our Long Experience

From the beginning of Starters, the Disco has always led.



GAS Starters were in vogue. We have equipped over 150,000 cars with Gas Starters alone.

And, with the coming of the Electric Starter, motorists knew that the Electric Disco would lead.

The Price

The initial cost is somewhat above other Electric Starters. But who could expect to buy the most durable and dependable product in any line at a ridiculously low price?

And what reputable automobile maker, in order to save $50 or $100, would deny you your choice of Electric Starters?

Send for Book—FREE

Our new Book is proving a revelation to motorists who thought all Electric Systems complicated. On the contrary, the Electric Disco is quite simple. With the Book before you, it is easy to understand the basic principle of Electric Systems. In 6 minutes you have it all.

Send for this terse, non-technical, instructive book. Get posted. Send Letter or Postal, whichever is the more convenient.

THE DISCO COMPANY
715 Dodge Building **Detroit, U. S. A.**

Published Weekly by the Motor World Publishing Company, 1600 Broadway, New York

Truffault-Hartford
SHOCK ABSORBER

An Easy Riding Car Needs Few Repairs

If it were not for the jolting and jarring a car receives on rough, uneven roads, its usefulness would be extended indefinitely. Excessive wear and tear are arrested comfort is assured—and tire mileage increased by the use of the Truffault-Hartford Shock Absorber.

These absorbers are now included as regular equipment on 25 leading cars, after a thorough laboratory test by their factory engineers. No car can render the best service without them and their inclusion on any car means the betterment of its riding qualities and endurance, as well as the reduction of its up-keep cost.

HARTFORD SUSPENSION CO.

Office and Works
Jersey City, N. J.

Branch Offices
and Dealers
Everywhere



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BALL BEARINGS
HERE
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EVERYWHERE
Quality



A Century's Progress in Wrench Making

The crude implement that served as a wrench 100 years ago emphasizes the perfection of the drop-forged, tempered steel

Billings & Spencer

"The tools that are guaranteed"

WRENCH

—recognized by machinists in general as the last word in wrench making.

Critical selection of steel, perfect drop forging of parts, and micrometrical exactness in assembling, make possible the "guarantee of a lifetime of service" under which it is sold.

Write for Catalog and prices

BILLINGS & SPENCER COMPANY
Hartford, Conn.



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Mr. Dealer:

¶ Protecting the trade means hearty co-operation on the part of the manufacturer.

¶ Inquiries and orders received by us from automobile owners are referred to those dealers who handle our

MONOGRAM OIL

¶ Surely this is something to take into consideration when you are thinking of what line of oils and greases to carry in stock.

¶ Write for our proposition.

NEW YORK LUBRICATING OIL CO.
Consolidated with
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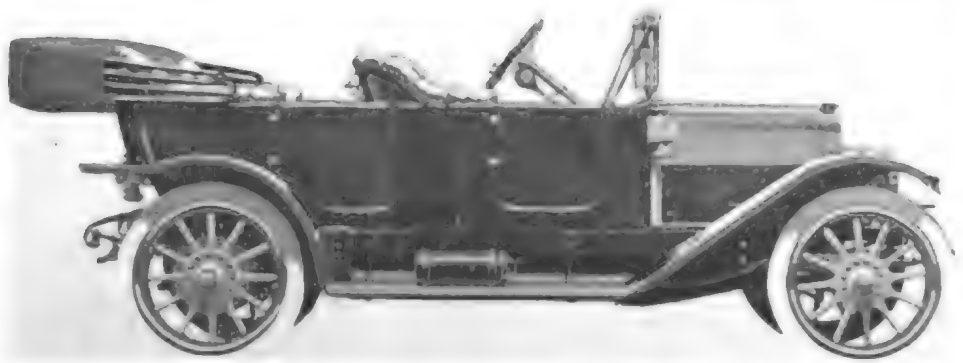
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MOTOR WORLD

Vol. XXXIV New York, U. S. A., Thursday, March 13, 1913 No. 12

SALE TO DETERMINE FUTURE OF EMBARRASSED MATHESON

Property of Company, Which Failed, to Be Sold by Receiver-president Next Month—Assets Are Appraised at $680,000.

Whether or not the Matheson Automobile Co., of Wilkes-Barre, Pa., will recover from the embarrassment which overtook it on December 20th last will become known soon after April 21st next. For on that day, by order of the court, the property will be offered for sale by William C. Shepherd, the receiver, who was president of the company at the time of the failure. The identity of the purchaser of the plant probably will indicate the future of the Matheson establishment.

The property which will be offered for sale has been appraised at $628,708.45, of which $226,410.15 is subject to first and second mortgage bonds, totalling $257,222.11. The certified "appraised sound values" are as follows: Land, $32,000; buildings, $80,201.67; machinery and equipment, $181,720.64; patterns, $20,196.25; inventory of stock, $363,352.05; New York City branch, $5,237.84; total, $682,708.45.

The company's own schedule placed its assets at $706,137.87, the property covered by mortgages being: Land, $32,000; buildings, $80,201.67; machinery and equipment, $181,720.64.

Among the accounts receivable appear the items, "Automobile Board of Trade, $642.71," and "New York show, $750."

In addition to the first mortgage bonds, of which $183,200 are outstanding, and second mortgage bonds, of which $68,500 are outstanding, it appears that the Matheson company, on January 27, 1912, effected a loan of $75,000 from those identified with it, giving as collateral a 50 per cent. interest in the list value of 49 Matheson cars, the numbers of which were specified in the trust agreement which was executed.

At the time of sale on April 21st, the property will be offered in separate parcels, after which bidders will be permitted to bid for all or any separate portion of the property.

Nonpareil to Produce Cubit Horns.

The Nonpareil Horn Co., of New York, has acquired an exclusive American license from the Kosmak Electrical Co., of Jersey City, to manufacture and market the Cubit $3 horn, the Kosmak company itself becoming chiefly a licensing company. It will, however, continue to handle the foreign business, securing the horns from the Nonpareil factory.

The transaction was brought about primarily by the unexpected demand for the Cubit horn, which reached such proportions that the Kosmak manufacturing facilities could not cope with it. On the other hand, the Nonpareil Horn Co., which previously had devoted itself exclusively to the production of bulb horns, possesses such facilities that the manufacture of the Cubit signalling device fits nicely into its scheme of things and will permit the demand to be properly cared for.

Incidentally, Morris Kind, of a wealthy Philadelphia family, has acquired a substantial interest in the Nonpareil Horn Co., of which he has become general manager.

Mason Personally Purchases Flint Plant.

A. C. Mason, president of the Mason Motor Co., of Flint, Mich., personally has purchased the plant in that city formerly occupied by the Randolph Motor Co., which several months ago was sold over its head to the Sterling Motor Co. Mason, it is stated, will lease the property to the company bearing his name, and when it takes possession, the present Mason plant will be occupied by the Little Motor Car Co., which thereby will obtain much needed space. The Little and the Mason companies are closely affiliated, the former making the engines for the latter and both being under the immediate influence of W. C. Durant of the Republic Motor Co.

STATE OFFICIALS' QUARREL HOLDS UP DEALER'S MONEY

Governor of Arizona Appropriates Car Bought for Jail and State Refuses to Pay—Dealer Waits Long and Then Sues.

If a Commonwealth buys an automobile for use in a State prison, and if the governor takes the new car and sends his old car, which also is owned by the State, to the prison, has the State auditor any right to refuse to audit the automobile dealer's bill? Lest any quick-witted tradesman attempt to solve the riddle, it may be said that his effort may be wasted, for the problem has kept the auditor, the board of control, the governor and a considerable portion of the trade in Arizona in a turmoil for weeks, and now the Arizona Motor Co., which sold the car, is suing for its money. The amount asked is $2,343.

The trouble started when a salesman of the Arizona Motor Co. learned in the peculiar way in which salesmen learn things, that the State was in the market for a car to be used in the penitentiary, and he utilized his merchandizing talents to such good effect that the sale was arranged and a warrant was drawn upon the State treasury for the price of the car and some extra equipment, the warrant, however, specifying that the car was for penitentiary use.

When the brightly shining car, an Abbott-Detroit, arrived last November it sparkled in the bright Arizona sunshine, and when the governor, who was driving an old Locomobile which had been purchased by a preceding administration, saw the new car he fell in love with it at once. He was told that the car was for use at the penitentiary, but the governor's desire was so great that he nevertheless backed the new car into his garage and considered the matter settled when he kindly dispatched his old Locomobile to the jail. He thought he had settled the matter, but he hadn't. It is

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quite likely that the superintendent of the penitentiary, having expected a new car for a long time, was somewhat disappointed when he saw the battle-scarred Locomobile presented to him as "his new car."

Whatever his feelings, there evidently were others who disapproved of the chief executive's act, for the auditor at once announced that inasmuch as the new car never went to the penitentiary, as the warrant specified, he could not O. K. the bill—and he did not O. K. it. The board of control and the auditor have had several heated sessions, and it began to look to the Arizona Motor Co. as if the only way it could ever get its money was to sue the State and let the courts settle the squabble in which the State officials have become embroiled; therefore the suit was instituted. Meantime the governor continues to enjoy the new Abbott-Detroit.

Weed Finally Enjoins E-Z-On Grip Makers.

After having had its preliminary injunction dismissed in the United States District Court in New York City, on the grounds that being an exhibitor at the New York Automobile Show did not give the E-Z-On Chain Tire Protector Co., of Washington, D. C., a place of business in New York City, the Weed Chain Tire Grip Co. proceeded to bring an action in Chicago for alleged infringement of the Parsons patent, No. 723,299, and this week was granted a preliminary injunction against the E-Z concern. The E-Z grip had links of a peculiar construction, they being longer than the Weed links and those at the end of the cross chains having a V shape; this, the defendants contended, would cause the cross chains to bind and not creep when a stress was applied, but the court held that there was a liability of creeping. Other defendants were Edward D. Lewis, Thomas V. Garvin and Matthew J. Frambach, who recently formed the company but who hardly had launched into business before litigation resulted, the suit in New York City being the first.

No Motor Palace in San Francisco.

There will be no "automobile palace" at the Pacific-Panama Exposition in San Francisco after all. After canvassing the trade, the National Association of Automobile Manufacturers, which provisionally had passed on the elaborate plans for such a building, has found that the prospective exhibitors at the San Francisco fair will not be sufficiently numerous to justify the erection of a special structure of any sort. Accordingly the automobile exhibits will be located in the Transportation Building, in which the Exposition authorities will set aside 60,000 square feet for the exhibition of automobiles.

RETAIL PRICE AGREEMENTS UPHELD BY BRITISH COURT

Declares It Would Be a Scandal Were It Not Possible to Enforce Them —Decision Contrary to American Law.

Whatever may be the judicial or other opinions in this country regarding price maintenance contracts, the King's Bench Division of the British court has ruled that while "agreements for the maintenance of price are of modern growth and might be unfamiliar to those who had been educated on older notions, nevertheless such agreements are almost universal in commerce and it would be a scandal if they could not be duly enforced."

The strong language and direct approval of what has been adjudicated as illegal in the United States was rendered by the court last month in deciding in favor of the Dunlop Pneumatic Tyre Co., Ltd., which sought an injunction against and damages from a London department store which broke its agreement to maintain the list price of Dunlop tires. The price cutting in question was not the violation of a conditional license clause such as is employed by many American manufacturers but was a fracture of what was undisputedly a price agreement. Almost the identical thing was only recently declared a violation of the Sherman anti-trust law by Judge Ray in the United States District Court for the Southern District of New York when he condemned a dealership price contract of the Waltham Watch Co.

The principals in the litigation were the Dunlop company, A. J. Dew & Co., tire jobbers, and Selfridge & Co., of London, a large American-managed department store which bought tires from Dew, the price agreement being in effect throughout the course of the travel of the tires from Dunlop to Selfridge. The specific charge was that Selfridge & Co. has sold two tires at cut prices and therefore had become liable to a penalty of £5 for each violation, which sum the contract specified should be paid for each case of price cutting.

As usually is the case in this country, the defense argued that the agreement was in restraint of trade and contrary to public policy. The Dunlop attorneys, however, introduced evidence to the effect that such agreements were necessary for the protection of the small dealer in the country who, without some protection in the way of price maintenance, could not afford to carry a stock of tires; and should he not carry them, it was argued, the entire touring population would be put to an immeasurable inconvenience by being unable to purchase tires outside of the large cities. A. J. Dew, for the plaintiff, testified that so far as he knew there was no "ring" of manufacturers, formed for the purpose of keeping prices up generally, and that there was free competition between manufacturers in the sale of tires.

The defendants also contended that even if everything were proven against them, the action properly could be for damages only and not for an injunction, and they further contended that there was lack of mutuality in the price contract in that it was one-sided, there being no consideration on the part of the tire makers. The court, however, held that since the Dunlop company permitted the store to trade in Dunlop tires and to exact a commission upon sales there was a consideration sufficient to make the contract valid.

Relative to the defense that there was restraint of trade the court, as stated, declared it would be a scandal if such contracts could not be maintained, and not only directed damages of £10 but granted an injunction preventing further price-cutting by the department store.

California Sees "Chain of Factories."

"With millions of dollars of Eastern capital behind them," according to a San Francisco report, "Louis B. Jennings and Allen Sheldon, both automobile manufacturers of New York, together with James Scott, a capitalist of Manila and Honolulu, and W. D. Yeager, a banker of Washington, D. C., arrived in San Francisco yesterday preparatory to establishing in California a chain of factories for the production of high grade automobiles."

While Jennings, Sheldon, et al., frankly admit that they are merely "investigating industrial conditions," they naturally think well of California as a location for their "chain of factories." But as, despite San Francisco reports, neither Jennings nor Sheldon are so prominently identified with the automobile trade in New York as to make their identity certain, and as it is not made plain just how far behind them are the "millions of dollars of Eastern capital," it is not possible at this time to distinguish even the weakest link in the projected "chain of factories."

Lozier to Increase to $5,000,000.

The Lozier Motor Co., of Detroit, is preparing to increase its capital stock from $3,000,000 to $5,000,000. For the purpose, a special meeting of the stockholders will be held on the 19th inst. The present capital is made up of $2,500,000 common and $500,000 7 per cent. preferred shares. The new stock will add $1,000,000 to each class of stock.

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OPENING MONTH OF EXPORT YEAR SHOWS BIG INCREASE

Total Valuation of Cars, Parts, Engines and Tires Is More Than $3,000,000—Car Imports Lose, Parts Imports Gain.

Although the 1913 export year opened with no such rush as ushered in 1912, when the increase was more than 100 per cent., January of the present year gained 20 per cent. in value of automobiles and automobile products shipped to foreign countries, which increase amounts to $533,592, according to advance information furnished by the Federal government; the total valuation of cars, parts, tires and engines for January, 1913, is $3,226,848, as compared with $2,693,256 for the same month of the year before.

While statistics as to the countries to which the goods were sent are not yet available, the preliminary report shows that the shipments of cars last January were 2,157 in number and $2,234,077 in value while twelve months before the figures were 2,047 and $1,955,290, gains of 110 in number and $278,787 in value. Of the cars shipped the first month of 1913, 87 were commercial vehicles with a value of $182,271 and 2,070 were pleasure cars with a value of $2,051,806, an average value of $2,095 for trucks and $991 for cars.

Of the products other than completed cars, parts showed a loss when the two Januaries are compared, 1912 with $472,601 being $38,665 greater than 1913 with $433,936. Tires showed a goodly increase, the $161,337 worth exported in January, 1912, growing to $273,519 by the last January, a gain of $112,182. The number and value of automobile engines exported in January of the present year was more than twice those figures for the initial month of the preceding year; the 1912 figures were 837 engines, valued at $102,028, while those for 1913 were 1,705 engines, with a valuation of $285,316, a numerical gain of 868 and a monetary increase of $183,298.

Import figures may appear a trifle inconsistent in that, while car imports fell off considerably, the inward shipment of parts gained by nearly one-half; in January, 1912, 84 cars valued at $199,197 were imported and the cost of the parts was $25,145, while in January, 1913, the figures were: Cars, 71; value, $174,689; parts, $37,688. The cars lost 13 in number and $24,508 in value, while parts gained $12,543.

"35%"-Rubly Case Not Ended Yet.

Although the 35% Automobile Supply Co of New York City has twice beaten William Rubly, a grease gun manufacturer of Tuckahoe, N. Y., in a suit over one of the "35%'s" now famous advertising contracts, in the Supreme Court for New York County, Rubly is to have another try at the matter; two weeks ago, when Rubly's attorney failed to appear to try the case when it was called, an inquest, or one-sided trial, was held and judgment taken by the "35%," but now that Rubly's attorney alleges that he was engaged on other cases and could not attend, the court has decided to permit him to open the default. Holmes Jones, the attorney, was, however, roundly scored by the court, which at the inquest said: "The court is of the impression that this particular attorney has been trifling with the court and has been seeking by unworthy methods to obstruct justice."

Long's Bond Offer Discloses Earnings.

The Long Mfg. Co., of Detroit, which manufactures the radiator of that name, is offering for public subscription $75,000 of its first mortgage 6 per cent. bonds in denominations of $1,000. The interest is payable semi-annually and the bonds are redeemable at 102½. They mature in amounts varying from $5,000 to $12,000 on the first of February for the next ten years.

The Long company itself has capital stock of $255,000 and a surplus of $62,154. The first mortgage bonds which are offered for sale are a part of an authorized issue of $100,000. According to the Long report, its earnings for the years from 1905 to 1912 averaged $20,208, which, from present indications, are likely to be greatly exceeded during 1913, as for the first six months of the company's fiscal year the earnings amounted to $18,424.

Chandler Quits Detroit for Cleveland.

The Chandler Motor Car Co., which recently was organized by former department heads of the Lozier Motor Co. for the purpose of manufacturing a light "six," has removed its offices from Detroit to the Swetland Building in Cleveland, Ohio. The offices will be maintained at that address until the factory in Detroit is completed.

Evans Forming Detroit Parts Company.

William F. Evans, of Milwaukee, who formerly resided in Detroit, has purchased the factory property in the latter city previously occupied by the Michigan Twist Drill Co. and is preparing to utilize it for the manufacture of automobile parts. Evans now is organizing a company for the purpose.

Couzens Heads Detroit's Chamber.

James Couzens, secretary of the Ford Motor Co., has been elected president of the Detroit Board of Commerce. He is the third successive member of the automobile trade to be chosen to fill that office.

ON SECOND ATTEMPT WEED ENJOINS WHITTAKER GRIP

Manufacture of Latter Continued Despite Adverse Ruling in Willis Action—Massachusetts Court Admits It's Convinced.

Despite the fact that the Weed Chain Tire Grip Co. was successful when it brought suit in the United States District Court for the Southern District of New York against the E. J. Willis Co. for infringing the Parsons patent, No. 723,299, by selling the Whittaker tread, the manufacturer, the Whittaker Chain Tread Co., which is located in Boston and is outside the jurisdiction of the New York Federal court, declined to recognize this verdict as of any effect in the District of Massachusetts and continued to make and market its grips until last week, when the Weed company, in a suit in the Federal court in Boston, was granted a preliminary injunction restraining operations of the Whittaker concern.

The Willis suit, after it entered into the accounting stage, was appealed by the Willis company, but according to statements of the Weed interests the appeal has not been actively prosecuted and this information was incorporated in the Boston action, there also being made the statement that whereas the Whittaker company had borne the expense of the Willis suit it refused to come in as a party to the defense, and thereby secure a final adjudication through the one lawsuit; this refusal is said to have been the reason for the bringing of the suit in Boston, for the purpose of reaching the manufacturing company.

The Whittaker company manufactured Whittaker, Besdam and Empire grips, which are said to be similar to the Weed, with the exception of the mechanical difference that the side chains are connected at their free ends with harness snaps and the cross chain hooks differ slightly at their terminals; in rendering decision on the motion for a preliminary injunction, Judge Frederic E. Dodge went into the history of the Parsons patent insofar as litigation in his court was concerned and likewise commented upon statements made by the Weed company as to the financial responsibility of the Whittaker company, which, it is stated, has incurred heavy mortgage liabilities. After enumerating various cases and decisions and expressing his belief that the patent has been sufficiently adjudicated, the court turned to the Weed-Willis suit and said:

"The alleged infringing device in the suit last referred to is not claimed to differ materially from the device which the defendants now before me are making and

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selling. The defence and appeal in that case have been, indeed, as is undisputed, at their expense and under their direction, though they were not actually parties. They contend here that, notwithstanding Judge Lacombe's decision, the question whether their device infringes or not ought still to be regarded by this court as so far an open and doubtful question that no preliminary injunction shall be ordered at this stage.

"I am unable to take this view of the matter. I must agree with what has been said by the Court of Appeals for the Second Circuit in the suit against the Atlas Chain Co. above mentioned:

"'The history of the protracted litigation shows that, with few exceptions, the courts have regarded the Parsons invention as a meritorious one and have given it a construction sufficiently liberal to include all changes of form which accomplish the same result in substantially the same way.'

"Regarding the Parsons patent as valid and as having the broad scope thus described, I must also regard the defendant's device now before me as a device infringing the patent. In view of what has been decided since the injunction against the Standard Traction Co. was refused as above, I am unable to believe that there is now any such room for doubt upon the question of infringement by this defendant as ought to forbid the issue of a preliminary injunction against it.

"From the plaintiff's affidavits it appears that the defendant is a Massachusetts corporation, having an authorized capital of $5,000, and that it owns no real estate; that on August 13, 1909, it mortgaged all its personal property and all that it might thereafter acquire and use in its business for $5,000; that subsequently, on March 21, 1910, it gave a similar mortgage to secure an issue of 6 per cent. bonds not to exceed $100,000 in total amount, and that both mortgages are on record and undischarged of record. The defendant offers nothing by way of affidavit which tends to modify the inference to be drawn from these facts regarding its financial responsibility.

"The defendant moves to suspend all proceedings in this case pending the final determination of the plaintiff's suit in New York against the E. J. Willis Co. on appeal from Judge Lacombe's decision above mentioned. It also contends that the plaintiff's delay in bringing this suit should bar it from summary relief. The delay complained of is during the period beginning with Judge Lacombe's interlocutory decree, on September 22, 1911, and ending with the filing of the bill in this case of January 27, 1913.

"One affidavit only is presented by the defendant. It is presented by its solicitor, who had also represented the Willis Co. in the New York suit. Its allegations relate almost entirely to what has been done in Court in that suit or what has passed between the parties out of Court during its progress. Its allegations are not controverted by the plaintiff. But so far as the matters alleged have any claim to consideration by this Court in dealing with the present case, I cannot find in them any sufficient grounds for suspending the proceedings here. If it be true that the Willis Co. has been proceeding with its appeal in New York, at the defendant's instance, 'upon the assumption that it would not be sued in Boston, at least, until after the Willis appeal had been settled,' I do not see how the plaintiff can be held responsible for the assumption. If the expenses incurred by the appellant in New York have been large, or if any difficulty in providing for them has delayed a hearing upon the appeal, and if the plaintiff knew of this and might, by active co-operation to that end, have brought about an earlier hearing, or if it might, by bringing suit in Massachusetts earlier, have obtained a decision here in advance of the result in New York and at less expense to the appellant—none of these circumstances, in my opinion, give the defendant any claim to delay in these proceedings, or afford it any defence to the plaintiff's application. It is not disputed that the plaintiff has urged the defendant to become an actual party defendant of record in the proceedings against the E. J. Willis Co. in order that their result might settle the questions raised in the present suit; and that the defendant has refused to do so. And if I cannot hold that the defendant has been prejudiced, in any sense recognizable for the purposes of this case, by the plaintiff's failure to begin this suit earlier, I find still less reason to believe that it has been misled.

"A preliminary injunction may issue as prayed for. Motion to suspend is denied."

Hoover Ball Factory Ready in June.

L. J. Hoover, the former manager of the Flanders Mfg. Co.'s ball department, who, as stated in Motor World last week, purchased the ball machinery and finished and unfinished stock from the Flanders receiver, and who organized the Hoover Steel Ball Co. in Ann Arbor, Mich., will not remove his purchases to the latter city until about June 1st. At that time the Hoover factory, a brick and concrete structure, will be completed and practically ready for business.

Associated with Hoover in the enterprise are Frank Smith and C. E. Bowling, who have been in the ball making business for some 15 years. Hoover himself has been engaged in that industry for 19 years, having at one time been superintendent of the Standard Roller Bearing Co., and later one of the organizers of the Grant-Hoover Co.

Brass Goods to be Made in Peru.

The Crum-Wiley Mfg. Co., now located in Decatur, Ill., has secured a factory site in Peru, Ind., residents of the latter city, including a number of those identified with the Brown Commercial Car Co., having acquired an interest in it. The necessary factory building will be erected immediately and will be devoted to the production of all automobile accessories made in brass, particularly grease cups and other small parts. The officers of the reorganized company are: E. L. Crum, president; Max Kraus, vice-president; S. A. Shesler, secretary-treasurer. These officers with W. H. Brown, president of the Brown Commercial Car Co., and J. R. Woodring are directors.

Williams Gets Atlas Parts and Repairs.

The Auto Parts and Repair Co., of which P. A. Williams, Jr., is the moving spirit, has leased a portion of the former Atlas Motor Car Co.'s factory in Springfield, Mass., where it will carry a full stock of Atlas parts and not only repair Atlas cars but all other makes as well. Williams formerly was connected with the Atlas company and has with him a number of former Atlas employes. He states that it is even possible that the Auto Parts and Repair Co. ultimately may take up the production of commercial cars of the Atlas type.

Akron Strike Gradually Petering Out.

The strike of the Akron rubber workers is gradually petering out. Some of the professional labor agitators who caused the trouble are still on the ground, but they are being hard put to prove their worth. One day this week, after one of them had harranged a gathering of strikers, urging that they appear in force the following morning and make a demonstration at the Goodrich plant, he was rewarded by an assemblage of almost 50 men, who quickly dispersed at the order of the police.

Lexington Denies Having Been Absorbed.

Despite printed statements that the Lexington Motor Car Co., of Connersville, Ind., had been taken over by the Howard Motor Car Co., which was organized in that city several months since, the Lexington company denies that any such transaction has been consummated. "Nothing in such reports," is the Lexington reply to an inquiry.

Grabowsky Creditors Get 20 per Cent.

The trustee of the bankrupt Grabowsky Power Wagon Co., in Detroit, has declared a first dividend of 20 per cent., which is being paid. It is believed that remaining assets will net about 15 per cent. more.

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The Week's Incorporations

Portland, Ore.—Beaver Automobile Co., under Oregon laws; authorized capital, $150,000; to deal in motor cars.

St. Louis, Mich.—Admiral Motor Car Co., under Michigan laws; authorized capital, $50,000; to manufacture motor cars.

Thomasville, N. C.—Thomasville Motor Co., under North Carolina laws; authorized capital, $5,000; to deal in motor cars.

Painesville, Ohio—Vulcan Mfg. Co., under Pennsylvania laws; authorized capital, $200,000; to manufacture motor cars.

Jonesville, Mich.—Emery Whitmore Co., under Michigan laws; authorized capital, $5,000; to manufacture motor car supplies.

Richmond, Cal.—Richmond Motor Trucking Co., under California laws; authorized capital, $25,000; to operate a motor delivery.

Bangor, Me.—Penobscot Garage Co., under Maine laws; authorized capital, $10,000; to operate a garage. Corporators—Charles H. Storey, and others.

Amesbury, Mass.—Walker-Wells Co., under Massachusetts laws; authorized capital, $25,000; to deal in motor cars. Corporators—J. H. Walker, and others.

New Orleans, La.—La Croix Automobile Co., under Louisiana laws; authorized capital, $7,500; to deal in motor cars. Corporators—J. J. Wolf and others.

Lackney, Tex.—Placa Tractor Co., under Delaware laws; authorized capital, $100,000; to manufacture tractors. Corporators—W. E. Palmer, M. P. Glazo, and others.

Huntington, W. Va.—Jarvis-Huntington Automobile Co., under West Virginia laws; authorized capital, $100,000; to manufacture motor trucks and operate a garage.

Bangor, Me.—Spencer & Parsons Co., under Maine laws; authorized capital, $10,000; to deal in motor cars. Corporators—H. C. Spencer, C. W. Parsons, M. C. Parsons.

Camden, N. J.—Par-Kul Wheel Co., under New Jersey laws; authorized capital, $100,000; to manufacture wheels. Corporators—E. S. Muzzey, F. S. Sauerman, F. A. Kuntz.

Springfield, Mo.—Always Air Mfg. Co., under Missouri laws; authorized capital, $1,600,000; to manufacture tire sealing fluid. Corporators—R. P. Dickerson, and others.

Indianapolis, Ind.—Northern Auto Co., under Indiana laws; authorized capital, $10,000; to deal in motor cars. Corporators—J. J. Clements, R. M. Fleming, L. H. Vanbriggle.

West Allis, Wis.—Auto Transfer Co., under Wisconsin laws; authorized capital, $5,000; to operate a motor delivery. Corporators—O. M. Carter, John M. Carter, Emma S. Carter.

Chicago, Ill.—Atkins Carburetter Co., under Illinois laws; authorized capital, $2,500; to manufacture motor car devices. Corporators—Ila Olmsted, Cora Burch, E. G. Atkins.

Decatur, Ill.—Dawson Automobile Co., under Illinois laws; authorized capital, $10,000; to deal in motor cars. Corporators—Earle M. Dawson, Charles E. Dawson, Florence L. Dawson.

Layton Park, Wis.—Gas Tank Re-Charging Co., under Wisconsin laws; authorized capital, $25,000; to recharge acetylene gas tanks. Corporators—J. J. McJeskey, W. R. Ebert, Fred J. Pagel.

Rochester, N. Y.—Durno Mfg. Co., Inc., under New York laws; authorized capital, $100,000; to manufacture motor car appliances. Corporators—John H. Durno, John F. Turk, Milton Noyes.

Richmond, Ind.—Sedgwick Mfg. Co., under Indiana laws; authorized capital, $10,000; to manufacture motor car devices. Corporators—Richard Sedgwick, J. R. Sedgwick, James M. Judson.

Marion, Ohio—Automatic Puncture Stop Co., under Ohio laws; authorized capital, $10,000; to manufacture tire sealers. Corporators—C. E. Merkel, M. M. McKinstry, F. C. Smith, A. C. Queen.

Detroit, Mich.—King Motor Car Co., under Michigan laws; authorized capital, $200,000; to manufacture motor cars. Corporators—Artemas Ward, J. C. Bayerline, Artemas Ward, Jr., T. P. Case.

Trenton, N. J.—Taxi Service Co. of Trenton, N. J., under New Jersey laws; authorized capital, $25,000; to conduct an automobile business. Corporators—H. W. Snook, F. J. Rutter, C. H. Naylor.

Lima, Ohio — Gladwell-Crossley Motor Co., under Ohio laws; authorized capital, $10,000; to deal in motor cars. Corporators—A. J. Gladwell, C. C. Crossley, F. A. Holland, H. I. Bland, J. W. Roby.

Indianapolis, Ind.—Motor Starter Mfg. Co., under Indiana laws; authorized capital, $40,000; to manufacture motor car devices. Corporators—Samuel M. Brundage, William J. Sylvesta, Harry J. Herff.

Cleveland, Ohio—National Garage Co., under Ohio laws; authorized capital, $20,000; to operate a garage. Corporators—John Nally, C. A. Gardner, George L. Williams, R. D. Morgan, E. C. Nally.

Chicago, Ill.—Chicago Original Auto Polo Co., under Illinois laws; authorized capital, $20,000; to conduct amusement enterprises. Corporators—Joseph R. Deahl, Frederick W. Moore, Marie C. Suhr.

Buffalo, N. Y.—Willard Commercial Car Co., Inc., under New York laws; authorized capital, $50,000; to manufacture motor vehicles. Corporators—Robert A. Willard, John F. Schamel, Reginald F. Penton.

Billings, Mont.—Billings Auto & Machinery Co., under Montana laws; authorized capital, $15,000; to deal in motor cars and operate a machine shop. Corporators—Paul Behrendt, Frieda Behrendt, M. C. Holt.

Indianapolis, Ind.—Floatless Carburetter Co., under Indiana laws; authorized capital, $50,000; to manufacture carburetters. Corporators—M. M. Mahoney, E. S. Cornell, I. E. Rodgers, George D. Sisson, A. H. Cornell.

Dayton, Ohio—L. C. R. Storage Battery Co., under Ohio laws; authorized capital, $30,000; to manufacture storage batteries. Corporators—Samuel Loucks, Arthur Christy, Frank D. Reeder, Frank P. Brown, David I. Prugh.

Cleveland, Ohio—Diebold Products Co., under Ohio laws; authorized capital, $25,000; to manufacture motor cars. Corporators—Charles R. Diebold, Max Friedman, Louis P. Diebold, Martin W. Sanders, Mabel M. Hummel.

New York, N. Y.—Continental Rubber Works Selling Agent, Inc., under New York laws; authorized capital, $3,000; to deal in rubber goods. Corporators—Clarence E. Thornall, 50 Church street; Willis A. Darling, Walter S. Tullis, 35 Murray street.

New York, N. Y.—H. M. S. Motor Co., under New York laws; authorized capital, $22,500; to deal in motor cars. Corporators—Joseph J. Meyers, 66 West 85th street;

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Charles K. Starr, George P. Harvey, 134 West 49th street.

Far Rockaway, N. Y.—Far Rockaway Motor Vehicle & Cab Owners' Association, Inc., under New York laws; authorized capital, $500; to conduct a protective association. Corporators—James Harris, Edward T. C. Kelley, Harry Traver.

Buffalo, N. Y.—Conover Limousine Top Co., Inc., under New York laws; authorized capital, $125,000; to manufacture motor car fittings. Corporators—Rowland J. Conover, 180 Herkimer street; Charles E. Anglim, James T. Gilbert, Mutual Building.

New York, N. Y.—Robert Thedford Garage Co., Inc., under New York laws; authorized capital, $25,000; to operate a garage. Corporators—Robert Thedford, 1411 Union street, Brooklyn; George Glynn, Paul R. Gordon, 100 East 116th street, New York City.

Columbus, Ohio—Automobile Protective Association, under Ohio laws; authorized capital, $5,000; to guard owners against theft of motor cars and accessories. Corporators—William Lester, Mark A. Caputo, R. M. Switzer, E. L. Richards, A. M. O'Harra.

New York, N. Y.—Inter-State Motor Express Co., under New York laws; authorized capital, $3,000; to operate a motor delivery. Corporators—George D. Roedels, 22 Anderson avenue, Palisade, N. J.; Joseph L. McGee, Abbott Boulevard, Palisade, N. J.; Mary F. Fynes, 61 West 71st street, New York City.

New York, N. Y.—Norwalk Motor Car Co. of New York, Inc., under New York laws; authorized capital, $25,000; to deal in motor cars. Corporators—P. Lyndon Bryce, 121 Washington avenue, Newark, N. J.; Alfred L. Kirby, 49 Pennsylvania avenue, Newark, N. J.; Edward S. Murphy, 1205 Park avenue, New York City.

Boston, Mass.—G. L. M. Vulcanizing Co., under Massachusetts laws; authorized capital, $25,000; to operate a tire repair depot. Corporators—G. L. Matthew, and others.

New York, N. Y.—M. & S. Distributing Co., of New York, Inc., under New York laws; authorized capital, $3,000; to deal in motor cars. Corporators—Oliver P. Carpenter, Albert D. Bean, George A. Williams, all of 154 Nassau street.

Changes of Capitalization.

Detroit, Mich.—General Motors Truck Co. from $10,000 to $25,000.

Columbus, Ohio—Rogers Supply & Tire Co., from $10,000 to $25,000.

Downington, Pa.—Downington Motor Car Co. from $10,800 to $20,000.

Chicago, Ill.—South Park Automobile Garage Co. from $25,000 to $13,200.

SALESMAN AND CAR MAKER CARRY TROUBLE TO COURT

Walter Truck Manufacturer Demands Price of Demonstrating Car—Salesman Denies Debt and Demands Commissions.

The experience of Charles Wirth, of New York City, as a prospect hunter for the Walter Motor Truck Co., also of New York City, in 1910 appears not to have been satisfactory, for, in an action which the Walter company has brought against him in the New York City Court for the price of a demonstrating car and repairs, Wirth has entered a counterclaim for more than $1,000, and the court has upon its hands the problem of deciding who owes whom and how much.

Wirth entered into an agreement with the Walter company, he states, May 2, 1910, whereby he was to seek prospects for the Walter company on a 5 per cent. commission basis and the Walter people claim that he so acted for them for just two weeks; they charge that on the day he entered into the agreement he bought a demonstrating car, a Walter "24-30," the company making pleasures vehicles at that time, but that he paid only $1,602 of the $2,080 purchase price. Between September 30, 1910, and July 31, 1912, he is charged with having incurred a repair bill amounting to $345.60, which brings the total asked up to $823.60.

When Wirth entered his answer he said he brought about sales to the amount of $20,500 on the 5 per cent. basis, secured one other customer on a 10 per cent. basis, did other work aggregating $1,000 and sold the Walter company a Knox touring body for $500, for all of which he never received his pay. Just how he arrives at his result is a bit mystifying mathematically, but he totals his grievance as worth $1,004 and asks that the complaint be dismissed and his claim allowed. In replying to his contention the company states that his commissions amounted to but $200 and have been paid, denies his other allegations, and this week secured a court order directing Wirth to file a bill of particulars itemizing his claims.

Changes Among Prominent Tradesmen.

Ward P. Haines has been appointed advertising manager for the Anderson Electric Car Co., of Detroit. He succeeds W. J. St. Onge, resigned.

R. E. Fries has been appointed chief engineer of the R. C. H. Corporation, of Detroit. He succeeds E. W. Winans, who resigned to become chief engineer of the Maxwell Motor Co.'s Dayton plant.

Robert Mott, manager of the United States Tire Co.'s Cincinnati branch, has been transferred to the management of the New Orleans establishment. The vacancy in Cincinnati has been filled by the appointment of E. W. Bailey.

W. S. Jewell, former district manager of the R. C. H. Co., of New York, has been appointed sales manager of the Boston branch of the Kelly-Springfield Motor Truck Co. P. S. Aultman, however, remains in charge of the branch as manager.

W. W. Garabrant, who has been connected with the service department of the Franklin Automobile Co. for the past four years, has been appointed district sales manager for the States of Nebraska, Kansas, Missouri and Oklahoma. He will make his headquarters in Kansas City, Mo.

Fred L. Morgan, former manager of the Standard Electric Car Co.'s branch in Cleveland, has been elevated to the post of factory sales manager, which means, of course, that his headquarters hereafter will be in Jackson, Mich. The vacancy in Cleveland has been filled by the promotion of George Dufranne, formerly assistant manager.

Louis Schwitzer has been appointed chief engineer for the Columbia Motor Car Co., of Hartford, Conn. He has had experience with several well-known automobile concerns in the West, latterly as chief engineer with the Empire Automobile Co., of Indianapolis. Previous thereto he was connected with the Atlas Engine Works, where he had much to do with the development of the Atlas-Knight engine.

Minor Business Troubles.

J. H. Kirkwood, proprietor of Kirkwood's Garage, 8500 Lake avenue, Cleveland, Ohio, has filed a voluntary petition in bankruptcy; he places his liabilities at $8,983 and his assets at $619.

The Schildwachter Carriage Co., manufacturer of carriages and automobile bodies at 1885 Park avenue, New York City, has filed a petition in bankruptcy; liabilities are $36,486 and assets $23,583.

A petition has been filed in the Federal court in Chicago asking that Sanford C. McKnight, a dealer in tires at 59 East Garfield boulevard, be adjudicated a bankrupt; the petitioning creditors are the Michelin Tire Co., which claims an indebtedness of $659; the Fisk Rubber Co., claiming $305.64, and L. R. Kerley.

Frank J. Boutell, of Flint, Mich., who gives his occupation as a laborer but who until recently was the proprietor of a garage in Bad Axe, Mich., has filed a petition in bankruptcy in the Federal court in Bay City, in the same State; his liabilities amount to $1,038 and his assets consist only of personal effects and household goods.

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In the Retail World

Frank Beebe has opened a garage in Paullina, Ia.

George W. Van Syckle is erecting a new garage in Santa Ana, Cal.

George Gohring will open a garage and repair shop in Iowa Falls, Ia.

The Three Rivers (Mich.) Garage Co. is having a new garage erected.

L. A. Motte has opened a garage in Cambridge, Ohio. He will specialize in car painting.

S. E. Stomer has leased the Weigle Garage in Montpelier, Ohio. He will operate it.

R. L. Van Valkenburg, of Lewis, Kan., has purchased James Shannon's garage and livery.

The American Welding Co., of St. Louis, Mo., has opened a garage at 21st and Olive streets.

C. R. Tucker is about to erect a garage in Brookline, Mass. The location is on Pleasant street.

Webb Clark, of Calumet, Ia., has purchased the Weeks Garage, in Primghar, in the same State.

Jay A. Stephens will open an accessory store in Pontiac, Mich. He will locate at 16 East Lawrence street.

The Haynes Auto Sales Co., of San Francisco, has opened a branch in Oakland, Cal., at Broadway and 25th street.

The Horst & Strieter Co. has established a garage business in Rock Island, Ill. The location is 1516 Fourth avenue.

The Tuxedo Tire Co., Inc., has taken over the business of the Tuxedo Tire Exchange, of 558 Mott avenue, New York City.

The Parmelee Motor Livery & Garage Co., of Chicago, Ill., has changed its name to Cottage Grove Livery & Garage Co.

Peter Larson is about to enter the garage field in Toronto, S. D. He has rented a garage building of the Toronto Land Co.

Cylde H. Smith has succeeded C. B. Lewis as Nyberg dealer in Boston, Mass. He will trade as the Clyde H. Smith Motor Co.

Alba and Roy Newton, formerly in the trade in De Kalb, Ill., are about to open a tire repair shop in Kirkland, in the same State.

Richards & Loeffelholz are about to open a garage in Cuba, Wis. They will locate in the C. K. Hall building, which they have leased.

J. F. Griese and G. M. Wilson have formed the Crescent Garage in Evansville, Ind. They also have secured the Empire agency.

George T. Jackson and his son, Edward, have formed the Jackson Auto Garage in Montezuma, Ia. They will handle the Paige-Detroit.

Landis & Co. is the style of a new entrant to the trade in Salt Lake City. It will be managed by H. D. Landis and will stock Avery trucks.

W. E. Robinson of Terre Haute, Ind., has purchased the garage of the Central Auto Co. The deal includes the Ford and Studebaker agencies.

Charles Wirtz, a garage proprietor, and Joseph Saum have formed a partnership in St. Mary's, Ohio, for the operation of a taxicab service.

F. H. Burnham & Son, hardware dealers in Watseka, Ill., and J. I. Body, a retired farmer, have entered the selling field. They have the Cole agency.

L. M. Larson has purchased an interest in the Lead City Garage Co., in Lead, S. D. He has been a branch manager in that city for McCord, Brady & Co.

Byerley, Hoole & Throckmorton have opened salesrooms in Kansas City, Mo., at 1909 Grand avenue. They have the agency for Kelly-Springfield tires.

Abner McCoy has purchased the interest of his partner, H. L. Koch, in the Palace Livery & Garage, in Pekin, Ill. He will continue the business alone.

J. C. Stevens, of Rock Island, Ill., has entered the garage trade. He is selling, not running, garages, having taken the agency for Ruby portable steel garages.

W. H. Galligan, Jr., and Edward Priebe plan to open a garage in Rhinelander, Wis. Gilligan has been employed by the Morgan Garage & Supply Co. in that town.

Raymond Manchia has entered the trade in St. Louis, Mo. He has secured the Century Electric agency and will open salesrooms at 4700 Washington boulevard.

The Lenox Auto Tire Works has opened up in New York City at 113 West 116th street; Charles Bergstein is manager. Supplies and repairs constitute the business.

Shanley Bros., dealers in Ottawa and Seneca, Ill., have arranged to open a third salesroom in La Salle, in the same State; they are Studebaker and Apperson dealers.

The Kay-Kuhn Co., an accessory company in Toledo, Ohio, whose Madison avenue location was destroyed by fire recently, has secured other quarters at 220 Erie street.

Peter Donner has acquired the interests of Joseph Baker and F. S. Larison in a building in Whiting, Ind., heretofore occupied by the El Paso Auto Co. Donner will open a garage.

The H. W. Neuman Machine Co., of 308 East Second street, Davenport, Ia., is building a new garage at Third and Ripley streets. It will be completed May 1. The Machine company is dealer in Auburn cars and Modern trucks.

Walter Leach and Harry Marienthal have purchased the repair business of Ranus & Taylor, in Saginaw, Mich. It is located on North Hamilton street. A line of accessories will be stocked.

The Sims Automobile Co., of Crookston, Minn., is about to establish a branch in Grand Forks, N. D., with Normal Bennington as manager. A branch recently was opened in Park River, N. D.

The Premier Waverley Sales Co. of Tennessee has taken possession of a new garage and salesrooms in Memphis, at 265-69 Monroe avenue; the company handles Premiers and Waverley electrics.

Three new salesrooms will be opened this spring in Nauvoo, Ill. The dealers and their lines are: Ochsner & Weber, Buick; A. McAllister, Cadillac and Oldsmobile, and Fisher & Hobbs, Ford.

The Butler County Tire Co. has entered the trade in Hamilton, Ohio, at 105 Main street; the business will consist of vulcanizing, repairing and selling tires. W. S. Lentz, of Indianapolis, is the proprietor.

George M. Height and Theodore Bennett of Spring Lake, N. J., have sold a half interest in the Clayton Garage to Timothy Hurley. The price paid was $17,500. Clark Clayton still retains a half interest in the business.

J. L. Allen and Roy Meeker have opened

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salesrooms in Bloomington, Ill., both located in the building occupied by the Bloomington Buggy Co., at 405 South Center street. Allen is State distributer of Enger cars, while Meeker represents the Patterson line.

Raymond Conkwright and James Brash have left the employ of the Illinois Motor Car Sales Co., in Urbana, Ill., and will branch out for themselves; they will open a vulcanizing plant and salesrooms at Railroad and Broad streets.

J. Colyer & Co., for several years carriage dealers in Newark, N. J., at 500 Central avenue, have entered the automobile trade; they have taken the Maxwell and Moon agencies and will devote their entire ground floor to cars. The company has been depleting its carriage stock for some time.

The Osen & McFarland Automobile Co., of San Francisco, has re-established a service station for Mitchell owners in Oakland, Cal. The station was discontinued some time ago, when the Osen & McFarland company succeeded the Osen & Hunter company. E. L. Peacock, who formerly managed the station, is again in charge.

H. W. Jones has purchased the interest of his partner, Frank Vana, in the Montrose Garage in Cedar Rapids, Ia., and will have erected a new building, 80 x 140 feet, on 1st street, between 1st and 2nd avenues. Jones is regarded as the pioneer repairman of that town, having been employed as repairman by the owner of the first car, a steamer, that was purchased in that city.

Recent Losses by Fire.

Columbia, Mo.—Columbia Automobile Co., garage and 14 cars destroyed. Loss, $20,000.

West Peabody, Mass.—Elder's Turnpike Garage and six cars destroyed. Loss, $20,000.

Chicago, Ill.—Tennant Motor Co., 2447 South Michigan avenue, building damaged. Loss, $7,000.

Detroit, Mich.—Aluminum Castings Co., molding plant and sand sheds destroyed. Loss, $10,000.

Syracuse, N. Y.—Abbott Garage, 1050 South Clinton street, garage and cars damaged. Loss, $2,200.

New York, N. Y.—Locke & Co., body builders, 218-20 West 84th street, plant damaged. Loss, $25,000.

Cambridge, Mass.—Myer Abrams Co., 150 Vassar street, garage and 45 cars destroyed. Loss, $100,000.

Los Angeles, Cal.—Crowe Auto Co., 1228-30 South Flower street, four cars destroyed and building damaged. Loss, $7,000.

HOLD "SANE" SHOWS OR NONE AT ALL, URGES ANDERSON

Detroit Manufacturer, Rich in Carriage Experience, Gives Voice to Radical Views—Would Not Mix Cars and Accessories.

Admitting that he does not believe that his views will serve to put an end to automobile shows, W. C. Anderson, president of the Anderson Electric Car Co., of Detroit, has placed himself on record as willing to co-operate in any way to bring about what he terms "sane shows."

His opinions on the subject were expressed in a letter to Alfred L. Pope, in response to the latter's communication urging that the National shows in New York and Chicago be discontinued, and the Anderson opinions are sufficiently radical to "stand by themselves in any company."

Originally one of the largest carriage makers in this country, Anderson for years had to do with the national carriage shows, and he ventures the prediction that sooner or later the automobile interests will arrive at the same destination.

For five years the carriage shows were quite successful, and the exhibitors obtained satisfactory results, but, unlike the automobile displays, there were no extravagant decorations or no money spent for wasteful purposes. When the shows lost their force, Anderson took the lead in an effort to bring about their discontinuance.

When the subject was broached, it was found that, while the larger manufacturers were practically of one mind, the smaller makers desired the continuance of the shows. As a compromise, Anderson suggested that the carriage manufacturers themselves take over the promotion and management of the shows and participate in the profits, which proposal, however, was set at naught by the show promoters, who leased and thereby tied up all the available halls in Cincinnati and Chicago where the shows had been held in alternate years.

Several of the larger makers, including Anderson, remained aloof, however, and by notifying dealers everywhere that they would not exhibit they at least partly accomplished their purpose, and in due course the show promoters cried "enough" and quit.

Before they did so, however, the carriage makers took a stand against the display of accessories and had them barred from all shows of finished vehicles, and "this is precisely what should be done today if automobile shows are to continue," says Mr. Anderson in amplifying his beliefs. "No automobile accessory man should be permitted to show his wares among the finished automobiles. Let them hold their show collectively in some other building. They are now occupying much of the best exhibit space, and on account of that have forced the New York people to divide their show and hire an extra hall, and hundreds of people take in the one show and do not go to the other. If the members of the National Association of Automobile Manufacturers are unsuccessful in stopping these shows, they certainly should be successful in making it an exhibition for finished vehicles only.

"The principle underlying automobile shows is wrong. Such a proposition was never heard of until the automobile came on the market. I consider it a crime to waste money in such a manner, and it is that very same thing that disgusts people. The average business man in other lines reasons this thing out and he says to himself (and justly so): 'Are these men crazy? Is this business run by men of sane business minds? What other business could be run along the same lines—pay to enter to buy something?' He naturally asks himself who is paying for this.

"It is true there is an entrance fee to the automobile show, but there was not to the carriage show, but the larger part of the expense is borne by the exhibitors and we all well know how to locate this expense. It is not newspaper advertising alone, but hotels, railroads and the extraordinary entertainments permitted, extra expense on exhibition cars, and the per square foot paid the promoters, running into thousands and thousands of dollars. Where does this land? In your overhead and mine, and the public getting wise.

"I question very seriously whether your efforts or mine would have such an influence as to put an end to these shows, but I am willing to co-operate in any way to bring about either no shows at all or what I might term 'sane' shows. Have them put on economically and at the lowest cost possible for exhibitors. I am of the opinion, if we must have a show, that not more than one should be held each year, and that at some central point in the Middle West. No place, of course, looks so good to me as Detroit, held at such a time of the year as people can find comfort in traveling. I would suggest the months of September or October—finished cars to be in one department by themselves and the accessories shown by themselves."

Goodrich Acquires a Canadian Site.

The B. F. Goodrich Co., of Akron, Ohio, is planning the establishment of a tire factory in Canada. The necessary site, 17 acres, already has been acquired in St. Catherines, Ont.

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KEROSENE FOR TWO-CYCLE MOTORS.

If the use of kerosene as fuel for motor propulsion ever does become general, as often has been predicted, it will mean a slight loss of prestige for the two-cycle motor, now chiefly confined to commercial vehicles.

The main idea advanced by its adherents in support of the two-cycle principle for vehicle propulsion, is its simplicity, which not only means the elimination of valves but of the usual lubricating system as well, for it has been fully proven that the simplest means of lubricating the two-cycle motor is to combine the lubricant in correct proportions with the fuel, whence it passes through the carburetter jet, and being so much less volatile than the gasolene, is precipitated for the greater part in the motor base. The fuel, if it be gasolene, has little or no effect in "cutting" the lubricant or destroying its properties which fit it for the work in hand, for it evaporates, or is readily taken up in the mixture.

With kerosene as fuel, however, such is not the case. Heat is necessary to effect vaporization of this fuel and heat also is effective in causing the vaporization of part of the lubricant, so that it is readily apparent that part at least never comes in contact with the surfaces to be protected. Admitted into the comparatively cold base, the mixture is precipitated as a whole and does not separate, as is the case with the gasolene and oil; thus are the lubricating qualities of the oil nullified by the lighter kerosene. From which it appears that at least one complication in the shape of a lubricating system which is distinct from the fuel system, must be added if two-cycle practice is to continue with kerosene as fuel.

TAXATION THAT SUGGESTS EXTERMINATION.

If New York City was not so thoroughly debt-ridden it would not be so easy to understand Borough President McAneny's proposal that the city emulate the State in piling taxation on motor vehicles. Mr. McAneny is not a "hack politician" and because of the fact, the city's prodigious and growing debt may truly worry him. His proposal therefore probably springs from sincere motives, but if Mr McAneny has fully realized all of the probable effects of his effort to raise more money, there is no evidence of it.

An analysis of the proposed scale of license fees indicates that the effect of such a measure, if passed, will be to legislate heavy vehicles out of existence, so far as New York City is concerned. A comparatively light machine, weighing 3,500 or 4,000 pounds, will carry something like 1,000 pounds on each rear wheel, and therefore will come within the class paying a tax og $50 annually. Many pleasure cars and most of the light delivery cars will come under this rating. A 5-ton truck carrying, loaded, 6,000 pounds on each rear wheel, is taxed $75 a year, and from this point upward the rate increases so rapidly that a 10-ton truck, the rear wheels of which will carry close to 10,000 pounds each, stands to cost its owner the huge sum of $1,000, to say nothing of the State tax and a possible further tax on width.

When men like Borough President McAneny stand sponsor for such movements, tax-ridden automobilists well may ask, What next?

IS AN ACCESSORY SHOW POSSIBLE?

Although the show situation has been settled for at least another twelvemonth, the radical opinions on the subject expressed by Mr. W. C. Anderson, president of the Anderson Electric Car Co., which are reproduced in another column, cannot fail to attract attention.

His belief that cars and accessories should be exhibited separately will, perhaps, provoke greatest diversity of opinion, in which the question, Can an accessory show stand alone? will be paramount.

It was given point this week by an accessory exhibitor who stated that the Boston show netted him more real profit than his exhibits at either New York or Chicago. He attributes it to the fact that the Boston show falls on the eve of the outdoor season and at a time when dealers are most inclined to stock up.

While there is no doubt that the assertion of this particular exhibitor will be disputed, the point, taken in connection with Mr. Anderson's belief that cars and accessories should be displayed separately, is whether an accessory show in a more central point than Boston, and not held in mid-winter but on the threshold of spring, would not bring more than the indirect results which now are too generally the rule, assuming, of course, that an accessory show of any sort is desirable or possible.

It is a thought which the accessory manufacturers themselves well may turn over in their minds.

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NEW YORK CITY MAY TAX TO POINT OF EXTERMINATION

Fees of Almost Unlimited Amounts Suggested for Local Licenses—Vehicles of All Kinds Included in Proposed Measure.

Not content with seeing the State "pile on the agony" and expense, New York City, or, at any rate, Borough President George McAneny, is seeking to add to the agony by having the municipality itself draw more blood and money from owners of motor vehicles, particularly, and incidentally—and more equitably—from the owners of all other vehicles.

McAneny would institute special city licenses costing from $1 to $2 for light cars and practically legislating heavy trucks out of existence; he has drafted an ordinance with that end in view, and while it is cold comfort to the burdened car or truck owner, it is an interesting example of the extension of a principle that the ordinance goes further and embraces in its scope everything that goes on wheels. The measure sets forth that "no vehicle shall be allowed to use or pass over the pavements of any streets of the City of New York after the passage of this ordinance without a license from the bureau of licenses of said city." Which, apparently, would also tend to increase the burdens of those who propel push-carts, wheelbarrows, baby-carriages and other "vehicles."

Even more startling is the proposition to exact license fees of large, not to say disconcerting, proportions from both horse and motor vehicles, such fees to range from $75 to $1,000 per vehicle, according to the load carried and the tire width. The reason given in all cases is that the pavements are rapidly deteriorated by heavy loads, and that the vehicle owners ought to go down into their respective jeans for the wherewithal to pay the piper.

In the proposed ordinance cognizance is taken of the capacity of narrow tires, heavily loaded, for damaging asphalt pavements in the setting of a maximum limit of 1,000 pounds load per inch of tire width, except in special cases where exceptionally heavy loads must be transported, when individual trip permits will be issued. It goes without saying that there will be well-proportioned special rates for these special permits.

It is proposed that the scale of wheel-weight fees shall range from $1 per year for a load of 750 pounds per wheel to $50 for 1,000 pounds per wheel. For weights in excess of 1,000 pounds per wheel the suggested scale of fees is as follows:

6,000	to 6,500 pounds	$75
6,500	to 7,000 pounds	110
7,000	to 7,500 pounds	150
7,500	to 8,000 pounds	200
8,000	to 8,500 pounds	300
8,500	to 9,000 pounds	500
9,000	to 9,500 pounds	750
9,500	to 10,000 pounds	1,000

For loads in excess of 10,000 pounds per wheel the rates are to jump $500 for each 1,000 pounds or portion thereof, so that a vehicle carrying 11,100 pounds per wheel would net the city the modest sum of $2,000 per year.

Ingenuity has gone even further, however. Heretofore no one has thought of taxing a vehicle for its width; but that is just what is proposed by McAneny's ordinance, which lays down a scale of fees for width, varying from $1 for a width of from 6.6 feet to 7 feet, to $25 for a width of from 8.6 to 9.6 feet.

It has been pointed out that the imposition of a special city tax would be in conflict with subdivision 7, section 282 of the State law, which states, with reference to the State tax: "These fees are in lieu of all other taxes, general or local."

Horseless Age Salary Suits Settled.

Just as they were about to come to trial last week in the Supreme Court for New York County, the suits of Samuel B. Stevens and John Lurie against the Horseless Age Co., of New York, were amicably settled. Stevens and Lurie, who were stockholders in the company, brought suit to recover money which they claimed Frederick J. Wagner, Charles B. Ames and T. B. Van Alstyne, as officers of the company, had voted and paid to themselves in the form of excessive salaries. Stevens and Lurie were two of four automobile tradesmen who were credited with being the financial "godfathers" of the Horseless Age officials and who made their ownership possible, and had it come to trial the action therefore would have exposed the sharp and broken ends of a one-time unusually friendly relationship. According to the terms of settlement, Ames and Van Alstyne will purchase the minority stock on time payments and have agreed to certain limitations as to their salaries. Wagner retired from the Horseless Age Co. about a year ago.

Caffe's Long-Fought Suit Settled.

Just at the time when it appeared as if the stock-selling suit of Michael P. Caffe against the Newark (N. J.) Automobile Mfg. Co., now bankrupt, would be threshed out in the New York City Court this week, the defendant and the plaintiff consented to a judgment for $875, which is about 15 per cent. of the $5,775 which Caffe asked. He sued as assignee of L. R. Bonta and Charles Hallock, who claimed that while they were under contract to sell stock in the company the concern itself disposed of $39,500 worth of stock and that they therefore were entitled to a commission on this amount. The case was tried, appealed, reversed and was about to be retried when settled.



March 3-15, Des Moines, Ia.—Des Moines Automobile Dealers' Association's fourth annual show in the Coliseum. First week pleasure cars; second week trucks.

March 8-15, Boston, Mass.—Boston Automobile Dealers' Association's annual show in Mechanics' Hall. Pleasure cars only.

March 10-15, Dallas, Tex.—Annual show of the Dallas Automobile Dealers' Association in the Fair Grounds Coliseum.

March 12-15, Peoria, Ill.—Peoria Automobile Dealers' Association's annual show in the Coliseum.

March 15, San Antonio, Tex.—Start of the second annual endurance run under the auspices of the San Antonio Light.

March 17-22, Norfolk, Va.—Norfolk Automobile Trade Association's second annual show in the State Armory.

March 19-22, Springfield, Ill.—Springfield Commercial Association's show in the Armory.

March 19-26, Boston, Mass.—Boston Commercial Vehicle Association's annual show in Mechanics' Hall.

March 24-29, Indianapolis, Ind.—Indianapolis Automobile Trade Association's show.

March 24-29, Watertown, N. Y.—Annual show of the Watertown Automobile Dealers' Association in the State Armory.

March 29-April 5, St. John, N. B.—New Brunswick Automobile Trade Association's show in Queen's Rink.

April 1-6, San Francisco, Cal.—San Francisco Automobile Dealers' Association's motor truck show.

April 5-12, Pittsburgh, Pa.—Pittsburgh Automobile Dealers' Association's seventh annual show in the East Liberty Market building.

May 5, Washington, D. C.—Start of the reliability-economy run for commercial vehicles under the auspices of the Washington Post.

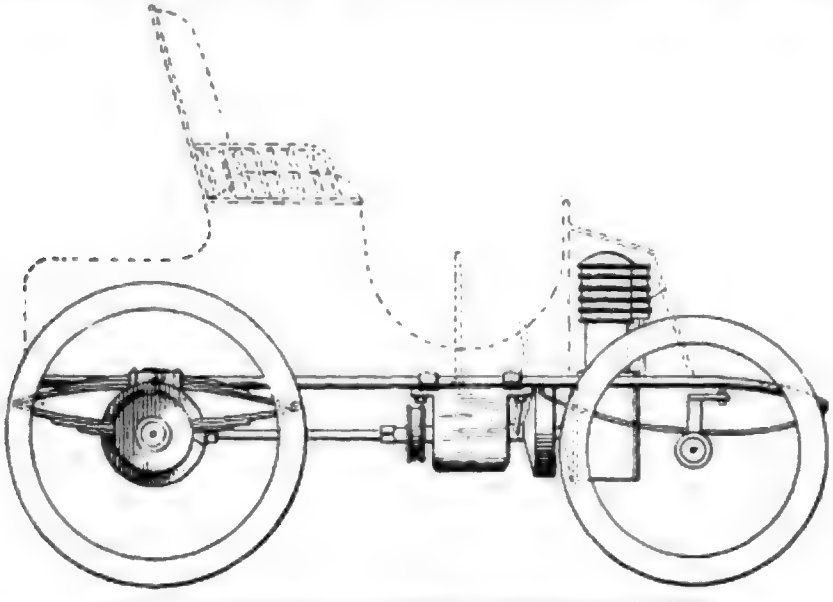
July 1, Indianapolis, Ind.—Start of the Indiana Automobile Manufacturers' Association's cross continental tour to Los Angeles, Cal.

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COMPLETE AUTOMOBILE IS PART OF DYER'S PATENTS

That He Is Inventor of Transmission Only a Wrong Impression of Long Standing—Grants Cover Many Modern Cars.

That the Automobile Board of Trade, which is soon to join the National Association of Automobile Manufacturers in the new and greater Automobile Chamber of Commerce, has acquired rights under the Leonard H. Dyer patents is well known in the automobile trade, and when the name Dyer is mentioned tradesmen almost without exception are quick to say, "Oh, yes! Dyer transmission patents." When the tradesman makes that remark he, in the street lad's vocabulary, "has said something," but the tradesman doubtless will be somewhat surprised when told that he "has not said enough," for Dyer's patents, which only about three years ago attained real prominence, not only cover the transmission used in most cars to-day but also include within their claims practically every entire car that is manufactured at the present time—not a part of a car, but a whole automobile.



THE CAR DEPICTED IN DYER'S AUTOMOBILE PATENT.

Dyer himself remarked the fact to a Motor World man only a few days ago.

Just how the popular misconception that the patents apply only to a transmission arose is a matter of dispute, but those who claim to know state that when the patents first loomed up in the courts a trade paper writer mistook the transmission element for the vital part of the patent on the automobile and furnished a false lead which has been followed ever since.

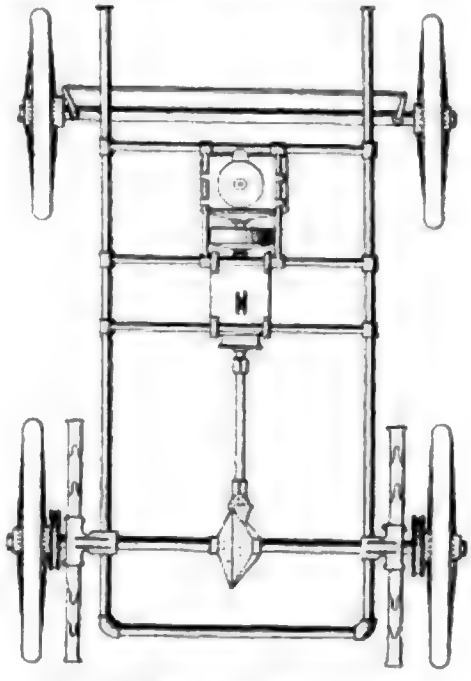
Dyer, whose patents are held by the Enterprize Automobile Co., was the originator of seven, of which five are of early date and cover transmissions, change gear gate and a completed car, but those which are regarded as vital to-day are No. 885,986, for a transmission, issued April 28, 1908, and No. 921,963, issued May 18, 1909, and covering an entire car. As their legal life is seventeen years, the first does not expire until April 28, 1925, and the automobile grant not until May 18, 1926, 12 and 13 years from now, which means much to both Dyer and the trade. The application for the automobile patent remained pending for nine years, having been filed February 3, 1900, and renewed September 22, 1908, while the transmission patent was applied for January 22, 1906; thus, it is seen, the whole transaction regarding the transmission came between the dates when the automobile patent was applied for and was granted.

Whether Dyer had accurate foreknowledge of the trend of events in the industry or whether he just happened to take out patent No. 921,963 because he thought it looked good to him is immaterial, but suffice to say, at a time when designers were putting motors under the seat and over the back axle and had not settled down to Dyer's idea he patented a combination of a motor in front under a hood, and then the successive elements in the power chain to the rear axle, including the chassis frame, springs and other now essential parts.

Introductorily the patent specifications state, "My present invention relates to automobile vehicles wherein an engine of the explosive or internal combustion type is used. The objects of my invention consist in improvements in the frame of the vehicle, in the driving gear therefor and in the speed changing and reversing mechanism."

Thereafter it is stated that the grant is to cover "direct driving connections between the motor and differential with such reduction as is necessary, owing to the relatively different speeds of such parts," and the "reduction" is covered by the transmission which is described in No. 885,986, the transmission patent.

Preferably the motor is located at the forward end of a steel frame under a hood and on a sub-frame and the power chain, consisting of transmission, friction clutch and the necessary shafts, terminates, of course, in a differential which may be located upon the rear axle or may be located upon a jackshaft, as is the case with chain-driven cars; it is also specified that univer-



PLAN VIEW OF DYER CHASSIS

sal, or knuckle, joints shall be used if necessary to allow oscillation of the frame without interference with the transmission of power. The patent states that the transmission, which is of the selective sliding type, is covered in patent No. 885,986.

Other things included in the combination are: Driving and steering wheels, the arrangement of the driving shaft longitudinally between the wheels, either midway between the wheels or not midway, a differential, and a reversing gear.

As is apparent, the claims read very much like a general description of almost any up-to-date car, and whether the use of a friction drive or a planetary transmission would relieve a manufacturer from a clash with the claims as a whole is a matter which has not been adjudicated; also the patent prefers a forwardly located motor which indicates an exemption from infringement, to an extent, at least, of cars otherwise constructed.

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UNSEEN PROFITS OF GARAGES

The Big Field of Extra Profits Which So Often Is Neglected—Striking Illustration of Trade Which Was Turned Away.

The man who drives a car just naturally thinks that the garage or store in which he bought the car is the place to buy the supplies he wants, and it takes the new car owner some time to be educated to the fact that while the average dealer sells gasolene and oil he overlooks entirely the opportunity to cash in on the necessary accessories.

A certain motorist in Cleveland wanted new batteries. He went to the place where he bought his car. He was going to stop there anyway for his gasolene, so why not get the new dry cells at the same time? Happy thought! So he stopped on his way home and, while his tank was being filled, asked for some new dry cells.

Garage the Natural Accessory Store.

"We don't keep them for sale," said the man who waited on him. "You will have to get those down town at such-and-such a place."

Disappointment No. 1. Query: Why didn't the dealer have them? No answer.

Two weeks later, on a Saturday night, he wanted his car washed and polished for Sunday. Getting to the garage at 10 P. M., he found that one man was sick and there were so many cars in hand that it would be out of the question to promise him his car before noon on Sunday. Too late. Happy thought: Why not buy some metal polish and wash the car at home early Sunday morning? Whereupon he asked the garage man for a gallon of metal polish, but "We don't keep it for sale, sir; just have it in bulk for our own use. I could let ye have a little in a bottle, sir."

Disappointment No. 2. Confidence in garage facilities gradually weakening.

Sunday morning, after his hard work, the owner planned a run into the country to visit relatives some 28 miles distant. He knew the county had been repairing roads and he was rather afraid of the outcome should one of the sharp stones come in contact with a weak casing on his right front wheel. Happy thought! Will stop at the garage and get a blow-out patch and an inside patch, in case of accident.

Loses Profit and Disappoints Owner.

Family all ready. Into the car everybody climbed. Just one thing to do before driving into the country. Stop at the garage for gasolene fill-up and some extra oil and—oh, yes! the blow-out patches.

Five minutes later the garage man was explaining that they didn't have blow-out patches; you would have to go to some tire dealer, etc.

Disappointment No. 3. Confidence turned to disgust.

Ample Stock Would Cost But Little.

Here was business that would pay a profit being turned away for no reason except that the garage man did not see the countless daily opportunities for making money. Did not realize that the sale of each car was creating a business for him that he had only to take care of to hold. Why not meet the demand? The price of a single car would enable most dealers to carry a stock of supplies sufficient for ordinary needs. And is there any objection to keeping customers and making all possible profit on them.

"GREEN" SALESMAN'S SYSTEM OF SEEKING PROSPECTS.

One of the simplest and most direct methods of getting in touch with prospects was originated by a green salesman. He had made good in other lines, but when it came to selling machines he did not know exactly where to start. He thought the matter over for some time and then made a hurried visit to the printer's, where he had a thousand cards struck off bearing the name and address of his firm.

Armed with these, he went downtown to the business section, and whenever he saw a car of the make he was selling waiting at the curb he stuck around till the owner appeared. His first question was "Is your car giving satisfactory service?" If not, this question was followed by an invitation to bring the car up to the service station and have it looked over. Almost every one admitted he was satisfied. At the conclusion of the conversation each time the salesman asked the motorist if he would kindly give him the names of any friends who might be interested in the purchase of a similar car. It was surprising how many names were secured in this way, and it was further interesting to note also that the business cards he handed out to each man interviewed kept turning up at the salesroom with amazing frequency.

The car represented sold for considerably less than $1,000, and yet this new salesman's commissions after a month or two of this kind of work ran from $350 to $400 a month.

PRICE CARDS FOR THE SALESROOM.

A neatly lettered price card on the running board of a car, or leaning "gracefully" against the wheels where it does not interfere with the flowing lines of the body, is a good investment for any salesroom.

Price is not the whole thing; indeed, in the minds of many salesmen it is the matter of least importance; nevertheless, people are interested in price, and when good values are apparent it is strictly good business to indicate the price of the car.

But a word of caution is necessary. Do not let the sign writer work off those fancy, high-colored, "instalment house" effects on you. Stick to plain black lettering on a white background. If you must have a second color use red, orange or a dark green.

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AWAKE-N-DISING WORLD

"TEAMWORK" IN SALESROOM

Dealer Who Believes in "Get Together" Methods and Results He Achieves—Salesmen Like Commendation as Well as Compensation.

An automobile dealer who has been remarkably successful in building an efficient organization—and also in keeping it intact—always makes a point of having his salesmen meet any prominent factory officials who come to call on him. Instead of allowing the factory man to take him out to lunch he makes a point of inviting him to lunch with himself and his men. This has two distinct effects. It makes the salesmen feel that the "family" idea which is talked about is real; and it gives the salesmen an opportunity for getting further first-hand information of the sort that helps to consummate sales.

Monthly Dinner Fruitful of Ideas.

This dealer believes that one of the prime requisites for a successful organization is to "get together." Once a month, at least, he and his men gather round the board at some good hotel or restaurant and spend the evening in earnest business talk that is invariably fruitful of new ideas. An effort is made to get exchange of experiences that have come up during the past month and the successful methods employed by one salesman in handling a difficult case are thus capitalized by his associates while the salesman is moved to greater effort.

Commendation Appreciated by Employes.

When one of his men consummates a good sale this dealer is the first that makes the salesman eager to put over another. In a word, this dealer recognizes that salesmen are just like other men, keen for the money, of course, but wonderfully appreciative of an encouraging word and amazingly loyal to a man who gives them a square deal. In the business of selling automobiles as in the business of baseball, team-work counts.

ONE DEALER'S WAY OF HANDLING PAINTING JOBS.

One dealer in a Western city who has no facilities for painting and refinishing cars manages nevertheless to earn a tidy sum of money each season on this work. He has a commission arrangement with a local carriage painter and personally guarantees the quality of each piece of work. Those who have purchased cars from him and found him square and trustworthy in other matters naturally prefer to do business with him rather than rely on an entire stranger. Thus he has developed quite a business without an investment of any sort.

One point in which his work has made a hit with his patrons is the fact that he will not accept a job that is not perfect. Paint covered over the greasy running gear never gets past him, and he is onto all the tricks of the lazy, careless painter who trusts entirely to having the general effect please the customer. It means better service for each man who gives him a job.

Enforcing High-Class Workmanship.

In the course of several years' experience this dealer had noticed that the average painter rarely pays attention to the brass work on the car but lets it go out of his shop spotted and dirty; thus the car looked new all but the brasses. He invested in a small electric buffing wheel and before the car gets to his customers it looks new all over. He even polishes the insides of the lamps. It costs a few dollars extra to have this dealer handle a painting job, but the real service he gives makes it easy for him to get the money.

SUGGESTED BY ACCESSORY SALES.

Nearly everybody seems to be reaching out after the automobile trade. Pretty good evidence that most everybody considers the automobile trade worth having, is it not? Department stores are selling accessories, hardware stores are selling spark plugs, wrenches, oil cans, oils and whatever else they can market. This business properly belongs to the automobile dealer, but he will never get it or control it until he really wants it and is willing to expend energy to serve the class whose wants seemed to have appealed to men of other trades while it has not appealed to him.

TIRE TROUBLE DISCLOSES LACK OF MERCHANDISING SPIRIT.

A cold winter's night; seven punctures in a four and a half mile drive; not a tire or accessory store open; not a garage within two miles that carried tires in stock; three garages visited and three 'phoned to; the sixth one had the much wanted tire. Such is a story of a recent experience in a typical Western city.

Garage Motorist's Only Night Haven.

After six o'clock at night the only place the motorist can look to for any help is the garage. There, at least, someone is on the job; but, as it appears from the story, many dealers are sadly lacking in the "merchandising spirit" and do not carry in stock those things which are needed by each and every car owner and which to be sold need only be carried.

Change in Dealer-Garageman Necessary.

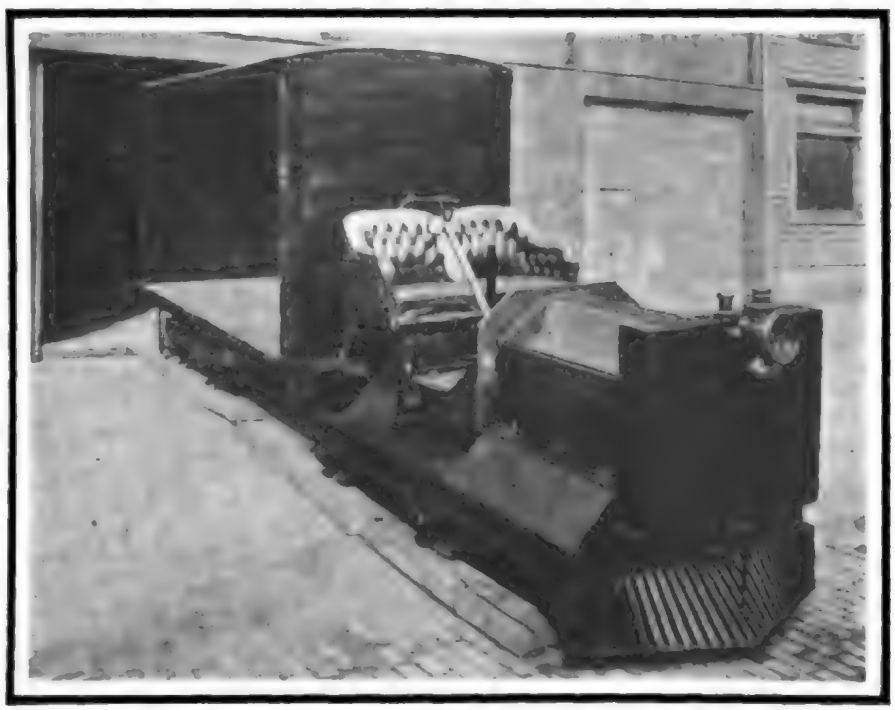
There will be a startling change in this respect before very long. Dealers will awaken to the fact that "profits are profits" and that "it pays to sell as many things as possible to your automobile customers." Many feel that this business rightfully belongs to them, but—unless a stock is carried and pushed so that car owners are brought to realize the dealer's claims, there is little chance of making money in a big way.

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USED CAR THAT FORMED BASIS OF A LOCOMOTIVE

Provided With Substantial Frame and "Regulation" Wheels, It Is Utilized in Paper Factory—Drive System Unique.

That a great many motor cars of vintage more or less remote and which, because of that fact, have become too uncertain in their functioning or, what is equally condemning, too noisy in it for use as motor cars, finally are shipped to rural districts and are disassembled and the component parts used for a variety of different purposes, there seems to be no doubt. Probably that is the end of nearly all that are not so warped out of shape by fire or smashed up in accidents to make them absolutely unfit for anything save sale as junk, but that there are a few which escape the "chores" of the farm is attested by the accompanying illustration, which is of an industrial locomotive improvised from a model 17 Buick, which is giving a good account of itself in the service of the A. P. W. Paper Co., of Albany, N. Y.



NEW YORK PAPER COMPANY'S CONVERTED BUICK "LOCOMOTIVE"

The original frame of the car was "clipped" off, so to speak, immediately behind the front seat and at the front so that the side members were flush with the front of the motor hood. New cross-members were riveted in place, so that the motor and transmission elements were not disturbed in their relation to that portion of the frame that was preserved. This frame then served as a sort of sub-frame and was rigidly mounted by means of angle braces to a very heavy main frame which was built up of six-inch channel iron girders riveted together and braced at the corners by means of web plates, to the elimination of weaving. The axle journals, which quite naturally are of the railroad type, are supported upon a pair of sills placed under the side members of the frame. The wheels are 20 inches in diameter and are forced in place on the two-inch axles by means of a hydraulic press in the orthodox manner of mounting car wheels.

Naturally the shortening of the wheel base necessitated an alteration in the final drive arrangement, and power now is transmitted to a countershaft, bevel wheel driven from the shortened propellor shaft and thence to the rear axle by means of a pair of chains of the silent type; of course, the differential mechanism has been eliminated, for it is obvious that its use would be superfluous when the rear wheels and axle are integral. It is quite readily apparent that the effect of replacing the regulation artillery wheels with the car wheels of so much smaller diameter is the same as if the gear ratio were lowered, so that when the gears are meshed to give the highest ratio—direct drive through the gearset—the motor is quite capable of starting the locomotive without undue laboring and without injury to the clutch. Naturally, when the trailer which is formed as part of the locomotive, as is clearly shown in the photograph, is heavily loaded with paper stock, or when the locomotive is hauling a train, starting is accomplished in the orthodox manner with the usual gear shifting. One very curious feature of the drive mechanism is the fact that the counter shaft can be shifted slightly in the direction of its axis, so that either one of two bevel gears which are mounted on it is brought into engagement with the bevel pinion on the end of the foreshortened propellor shaft; thus the motion of the countershaft is reversed and the three speeds provided in the gearset and originally intended for forward motion only, become effective in either direction. The gearset reverse is eliminated.

One more or less unusual departure was the removal of the radiator and the substitution of a sheet metal water container of large capacity. The reason for the change, however, is quite clear, since the locomotive operates in parts of the plant where a considerable quantity of dust floats continually on the air and, were the motor not fully enclosed, it would be littered beyond recognition after a few hours of service, even if the fan which functions to draw the air through the radiator were disconnected. Naturally, with the fan disconnected the radiator is but little better than the tank as a water cooler, since the speed of the locomotive is not sufficiently great to cause a large amount of draught through the radiator even when it is going forward, and it must be remembered that it operates in the other direction quite as much as ahead.

Very much of the "locomotive effect" which is disclosed by a glance at the photograph is imparted by the genuine "cowcatcher" or pilot which attaches to the front cross-member of the frame and serves to prevent persons of parts from falling under the wheels. The headlight, too, makes for a businesslike appearance.

Seattle Defines Adequate Warning Signal.

Seattle, Wash., finally has come to its senses. Some time since, that city passed an ordinance specifically prohibiting the use of Klaxon horns except on motor vehicles used by the fire and police departments and, despite its manifest discrimination, the ordinance was literally interpreted, drivers of automobiles having been stopped by the police to prove that they were not using Klaxon horns, all others being exempt. Seattle, however, has realized the absurdity of its ways and has enacted a new law requiring only a "bell, gong, horn or other signal device capable of producing an abrupt sound sufficiently loud to be heard above the noise of traffic." It is unusual, however, in that it also provides that except on public vehicles it shall be unlawful to sound such signal devices "more than three sharp, abrupt blasts in succession as a warning in any one emergency, or to sound such signal device at all except as a warning of danger."

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BRANCH MANAGERS COME UNDER DISCUSSION

Reilly and the Sales Manager Pay a Visit to One of Them and an Interchange of Opinions Results—Good Salesman Not Necessarily a Good Manager, Maintains the Factory Man.

"Hello, Jim!" greeted Reilly by long distance from his salesrooms some thirty miles from the factory which he represented. "Did you say you were going to New York to look over your branch there?"

"Yes; next week," replied the Sales Manager through the telephone on his office desk at the factory.



THE YOUTH STARED HARD AT THE CARD AND THEN AT THE RETREATING PAIR

"Well, I've got to go down the day after to-morrow," answered Reilly. Come down with me—can't you go this week just as well as next week?"

Inspection Trip on "Rawr" Morning.

To this request the Sales Manager finally assented, which accounts for the presence of the factory man and his dealer, each rubbing his sleepy eyes and sitting on the edge of a berth as their train sped along the Hudson above the city on a morning somewhat cold and very "rawr"; a few miles up the river the morning had been "raw," but now, according to the interpretation of the indigenous population, it was "rawr."

After the two had followed signs in the new Grand Central Station for what seemed like a goodly portion of a mile, they recognized the rumble of the Subway and started for the hotel colony about Times Square, first, of course, having to be yelled at by a ticket chopper for going through the wrong gate and without dropping in their tickets. When they had registered and had been relieved of their baggage, breakfast resolved itself into a debate which ended in Reilly agreeing to accompany the Sales Manager to the factory's Broadway branch with the understanding that the latter individual was to go with Reilly on the latter's business expedition later in the day.

Despite the "rawrness" of the morning the inland inhabitants decided that to walk was as expeditious as any other way of getting to the desired section of "Automobile Row," so, with after-breakfast cigars aglow, they moved up Broadway, past the offices of Motor World, and shortly entered a capacious showroom which bore the factory name; the two having entered, Reilly casually inspected the cars upon the floor, waiting for the Sales Manager to see the branch manager, and the Sales Manager also began an inspection, but of the mural decorations and nothing in particular, as he waited for some one to emerge from somewhere. Finally from a remote portion of the office someone did emerge, but it was not Bolton, the branch manager.

"Where's Bolton?" asked the Sales Manager.

"Not down yet," replied the stenographer.

"What time does he get down?" came the question, as the Sales Manager glanced at the wall timepiece; it showed 9:40 o'clock.

"He ought to be in soon," apologized the youth. "Won't you wait?"

"No; tell him I'll be back at 11 o'clock," replied the Sales Manager, as he handed the young man a card and walked out. And as the factory man and Reilly passed to the street the youth stared hard at the card and then at the retreating pair. When Bolton came in at 10.20 o'clock he, too, took several perplexed looks at the card and at the clock.

"Just what I was afraid of!" exclaimed the Sales Manager, as he and Reilly stepped outdoors again.

"What?" questioned Reilly.

"I didn't tell you before we came why I was coming," explained the Sales Manager, "but there has been something the matter with the branch lately and I'm anxious to find out where the trouble lies. I was afraid Bolton was the seat of the trouble and I believe I'm right."

"What's the matter with Bolton, and what's the matter with the branch?" was the dealer's query.

Efficiency Lacking in Factory Branch.

"It's only the old story of trouble we've had with branches before," went on the Sales Manager. "We never had very good luck with branches. Our dealers have been very satisfactory, as a rule, but we never seemed to be able to pull the branches up to the plane of efficiency we would like to have them on."

"Why not?" demanded the dealer.

"Now you've said something!" asserted the factory man. "Why not? That's what I want to know, and it will be a wrinkle-preventive if I can answer the question. This is a typical case; Bolton was a ripping salesman and did so well on the road that

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we put him down here to handle the branch, but for some reason results have been lacking. It's exactly the same thing that happened in our St. Louis branch, when we put McVickar down there as manager; he was a corking good salesman and is drawing good money for us now as a road man, but he didn't last long as a road manager.

"What happened?" questioned Reilly.

Inability to Analyze the Business.

"To start with, the efficiency of the place wasn't our idea of efficiency. It was bad enough before, but then it got worse. McVickar didn't have the faculty of sitting down and analyzing his business; he couldn't see where he could improve things, he didn't know how to manage either the men or the business. He never told his force how things should be done, and he had no discipline whatever; he got into the same habit Bolton has—that of thinking that a manager of a branch, seeing that he is paid a good salary for being manager, doesn't have to get down somewhere near beginning time in the morning and should not concern himself with small things.

"Just as in this case, complaints began to come to the office about the branch; our owners said they weren't getting the attention to which they were entitled. One man said he had gone to the branch several times and had stood around the floor for minutes at a time before he could find anyone to ask him what he wanted. When he did find someone, on one occasion, and it was one of McVickar's salesmen, the salesman seemed sadly in ignorance about the car he was selling. McVickar apparently never had put any of his salesmen through a catechism or seen to it that they knew the car as well as their manager knew it. One man told us confidentially that Mac himself didn't seem to know what was going on in his own business; that he expressed surprise when told of things that had happened and even hadn't heard of some goods that had been pictured or described in most of the automobile papers that are published.

"Who's in St. Louis now?" questioned the Sales Manager's listener.

Good Manager But Not a Salesman.

"We've got a man there now who never pretended to be much of a salesman," responded the Sales Manager, "and I wouldn't wonder but that he'll make good. I don't mean to say a salesman won't make a good branch manager, but the man in St. Louis now is a manager and not so much of a salesman; he can manage the place, he says, and make it pay if we'll hire men to do the actual selling. He says he doesn't want to be a salesman, for he's always held managerial positions."

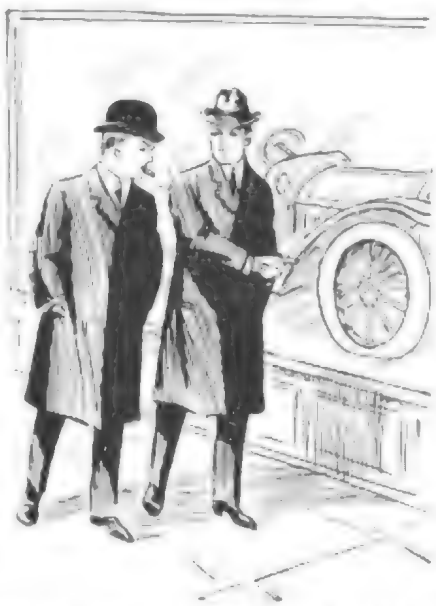
"Why, I know lots of salesman who have made red hot branch managers," interrupted Reilly. "Do you mean to say a salesman isn't a good manager?"

"No, no! Far from it!" exclaimed the Sales Manager. "A good salesman has qualifications which ought to make him the best of managers if he would only shake himself up and decide that he's really going to be a manager. I think I can wake Bolton up; it may be quite a task, but I believe it can be done."

"For instance?"

Lofty Attitude Is Not Effective.

"Well, to open up with, he's got to be made to see that he's got to get right down



"DIDN'T YOU SEE THE SOFT TIRES ON THAT CAR?" WAS THE ANSWER

into the thick of the business and not imagine that dictating letters to the factory is his chief mission in life, nor sit so high up that he's above all the details, and he's got to be the punch and mainspring behind every move that is made in his establishment," emphasized the factory man. "If he isn't going to be on hand when the branch opens in the morning he ought to have someone there to take proper care of anyone who may come in. He ought to make every salesman on his staff know the car thoroughly and be not only over-anxious to please anyone who walks into the place but competent to go out and seek prospects with an intelligent tale. A manager not only ought to know what to do and when and how to do it, but more than all else he must be able to tell the men under him the how and the why of it and, having told them, it is up to him to know why they fail to do things when they don't do them and to distinguish between explanations and mere excuses. That's the essence of executive ability. A salesman may make a good manager, but a manager doesn't necessarily need to be as good a salesman as he is a manager; if a man is onto his job and can put efficiency into an organization he can make the organization possess all the salesmanship that is required.

"Look there!" exclaimed the Sales Manager, as he pointed to a car in the window of another factory branch which they were passing. "I'll bet that branch, too, is far from one hundred per cent. efficient."

Soft Tires as a Caliber Indicator.

"Why do you say so?" asked Reilly, who stared long and hard at the front, window signs, car and other details, but who could not detect the clue which had prompted his companion's assertion.

"Didn't you see the soft tires on that car?" was the answer. "Do you know, Reilly, if I were a proverb maker I would say, 'Show me the tires on a salesroom car and I'll tell you how the salesroom is managed.' It's both a little thing and a mighty big thing; it isn't a half-bad index of the caliber of an automobile establishment and the way it's conducted.

"When I see Bolton I'm going to sit down with him and ask him to hold the branch up for his own inspection and ask him to see if he can't discover a few things that are lacking; if I can get him on the hunt for things that need remedying I'm positive he will go the limit in that line, for he's a thorough man when he once gets on the right track. The principal trouble with him, I imagine, is that he doesn't know where or how to begin."

Advice and Chance Possible Solution.

"I can't conceive of Bolton not making good," commented Reilly; "he always appealed to me as a man who would win out almost anywhere if he had a fair show."

"That's the way I size him up, too," declared the Sales Manager, "and I want to give him every chance."

For several minutes the two had been standing beside the little park at the uptown end of Times Square, and a glance at his watch told the Sales Manager he would have just about time if he started then to reach the branch for his 11 o'clock engagement. They crossed to the west side of the street, which a delayed morning sun had made a sort of springtime basking place, and the Sales Manager started uptown.

"What are you going to do until I come back?" he asked Reilly.

"Oh," hesitatingly replied the dealer, "just stick around, I guess—watch the styles and so forth." And as the Sales Manager began his second trip toward "Automobile Row" Reilly began an aimless but enjoyable ramble in the sunshine where the many-hued population of the chorus colony was just emerging for breakfast.

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BOSTON MIXES BABYLON AND MOTOR CARS

And Does So in a Manner That Pleases the Eye and Compels Admiration —Little That Is New Develops But the Picturesque Settings Cause All Else to Be Forgotten.



MAIN AISLE IN EXHIBITION HALL LOOKING TOWARD THE ENTRANCE

If Sam Miles, who runs those automobile shows in Chicago, can spare the time, he ought to run up to Boston before the 22nd of this month and seek out Chester Campbell. If he asks for it in the proper tone of voice, Campbell undoubtedly will provide him with a pass permitting him to enter Mechanics' Building, in which the Boston show will be housed until that date, and the show is worth the risking of even a Milesian eye.

Chester Campbell runs the Boston show for the Boston Automobile Dealers' Association, and while Miles has given the world some mighty spectacular show dressings, Campbell has done the same thing at very much less expense. He did it last year, and the year before, and the year before that, and he has done it again this year. In fact, this time he has simply exceeded himself, which is why Miles should go to Boston.

If he looks over the Babylonian garden which Campbell has hung or spread or planted in Grand Hall, which is the "show place" in Mechanics' Building, Miles is likely to blink at least one eye and to feel a very delicate green suffuse his countenance; and when the green gives way to red he is as likely to call together his Chicago artists and day-dreamers and order that the 1914 show in Chicago be laid out under Niagara Falls, or in the Grand Canyon of Arizona, or both. For Campbell has drawn not only from Egypt but from Bermuda for his "stage properties," and his brother, E. W. Campbell, who did the actual drawing, has made of it what the boy in the street probably would describe as "a swell job." It is by far the most spectacular automobile show ever staged in the New England metropolis and, as always, it is pleasing to look upon.

Still speaking of Grand Hall, which directly adjoins Exhibition Hall—all under the same roof—the show is set at the base of the Hanging Gardens of Babylon, the "hanging gardens" themselves being constituted by an immense painting which completely conceals one end of the hall. Terrace upon terrace of the "garden" stretch upward into the distance, a suggestion of a kingly palace and a waterfall, which was to have been wet but which isn't, forming a portion of the "garden" painting. At the opposite end of the hall, and over the elevated stage, is another heroic Egyptian painting, depicting the portals of Nebuchadnezzar's palace. It is of Egyptian architecture, of course, and if anyone doubts it, the winged and bearded lions of the Assyrian period, which guard the approach to the palace, are there to prove it.

The roof of the "hall" is concealed by a canopy of Egyptian tapestry, with openwork centers, from which are hung garlands of flowers and strings of green and white electric bulbs. Also pendant from the canopy are 10 large floral chandeliers, the flowers—chiefly red and yellow—being illuminated from within. Likewise hanging directly from the canopy are cross-sections of painted foliage. The balcony fronts are hidden with foliage in which, at regular intervals, are panels of bearded lions and other Egyptian characters, with here and there a plaster cast of an Egyptian mummy.

On the floor, where the cars are staged, 10 giant palm trees uprear themselves.

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There are smaller palms on the gallery and, take it from Mr. Campbell, they were imported directly from Bermuda especially for the occasion. Mr. Miles, it will be recalled, once imported genuine English walnut trees from Kankakee, Ill., for a show which he held in Chicago. But Campbell has "put it all over" Miles in at least one other respect. He has not only painted a wonderful waterfall in the Babylonian garden but actually has fashioned eight other waterfalls which extend almost from the roof to the main floor, where gilded fountains have been placed to catch the water which rarely flowed. There are four on each side of the hall and, truth to tell, they suggest toboggan slides as much as anything else. Advance notices stated that the water would "tumble down from the second balcony level over illuminated plate glass into fountains at the floor level." The glass is there—a bluish glass illuminated from underneath—but if ever the water "tumbled" no one saw it. On several occasions it dripped downward, and then it ceased to flow at all.

"Exotic Magnificence" Exemplified.

On the main floor, where the waterless fountains are located, the exhibitors' spaces are marked by corner posts or "turrets" of Egyptian architecture, the name of the exhibitor being illuminated from within. From the top of each "turret" sprout smaller palm trees, and with the life-size palms which grow from the floor and from the gallery, the foliage is impressively heavy. In fact, viewed from either end of the hall, the scene is truly imposing. The big paintings blend well with the other decorative effects and the picture is complete. Green and yellow are the prevailing tints, the burned brick of Nebuchadnezzar's time being carried, of course, into the paintings and into the "turrets," while the gallery rail and the walls of the hall are of similar hue, trimmed with green.

"Passing from the exotic magnificence of Grand Hall," to quote official language, and into Exhibition Hall the show-goer finds himself in what is officially described as "A garden of a century ago," when it appears that not merely white picket fences constituted "garden walls," but when it was the fashion to mark each corner of the garden by white colonial posts connected by light arched trellises.

Exhibition Hall, an immense triangular room with bare posts and equally bare girders, is not easily embellished, but each year the deft hands of the Campbells have dressed the nakedness in inspiring fashion. On this occasion, each post is made to represent the trunk of an apple tree, while the girders are hid, or half hid, by painted foliage which stretches out over the aisles and forms an umbrageous canopy for the exhibition spaces.

What They Did to the Basement.

The lower half of the walls is covered with painted landscapes which overlook white picket fences, to which fences, as is the case with the fences which separate the individual exhibits, are tacked sprays of hollyhocks and other old-fashioned flowers which are supposed to be nodding their heads over the pickets. Vines creep over the arched trellises and over the three pergolas which distinguish the main aisle, the monotony of the green being softened by strings of electric bulbs. It is a simple and comparatively inexpensive dressing, but somehow or other it is so deftly carried out that no description of it can do it more than scant justice.

The same skilled hands and artistic eye also have accomplished wonders in the basement, where tires and accessories and other things mingle. There the posts are covered with alabaster cardboard of a bluish tint, while the rafters are hung with blue and with red and white bunting and a profusion of red and white and green bulbs. Nothing could be simpler, and yet the effect obtained is more than passing pleasing to the eye.

The Bubble Blower of Boston.

It is in the basement where, as stated, cars and accessories and other things mingle; it is there that the machinery and machine tools—always a feature of Boston shows—are found in motion. It is there that the vendors of red lemonade and grape juice, and fountain pens, and magnifying glasses, and souvenirs, without which no Boston show is complete, also are located, and John Quincy Adams, with his dictionaries, is among those present, as usual, and, write it not in Babylonian hieroglyphics, there was at least one newcomer in the basement. He had a patented bubble blower for sale and, fat and apparently good-natured, he blew bubbles for the edification of young and old alike. There are those who maintain that it is not such a far cry from bubble-blowing to certain phases of the automobile industry, and possibly bubble blowers have as much place in an automobile show as automobiles have a place in the "garden" of a long defunct, and extinct and otherwise dead Egyptian king. Whether the Boston bubble-blower will find his exhibit profitable is of minor moment. He was there Saturday evening last when the show opened, and he probably will be there until Saturday next, when the doors close for three days in order that pleasure cars may be moved out and trucks moved in. They perform no Sunday work in Bosting.

If the cars that are exhibited could speak right out and voice their innermost feelings after the manner of some of Kipling's inanimate heroes, it is altogether likely that a few of them would boast of the mileage to their credit—made in box cars—and some of them might protest at the very nearly ceaseless round of show-going that started with the New York exhibition and has continued right up to date. Also, they might boast of the number of pairs of curious eyes that have gazed at them and the number of equally curious fingers that have prodded their yielding upholstery. At least one of the cars on view, a luxurious Locomobile limousine done in two tones of maroon and finished in crimson silk and gold-plated trimmings, has done quite a little traveling since first the show season opened in New York. It was exhibited in Madison Square Garden, when it dropped out of sight for a time, only to reappear in the Coliseum in Chicago. From Chicago, it was shipped back to New York and helped beautify the Brooklyn (N. Y.) dealers' exhibition; now it is in Boston and it attracts just as much attention as ever it did. Incidentally, it is flanked by a pale green Locomobile limousine, tricked out with silver trimmings, that has been its companion on at least a part of its travels.

Glimpses of Things Worth Seeing.

These are only two of the transplanted exhibits, of course. Almost everywhere others greet the eye. Under the signs that blazon forth the names of old and well-known cars there is very little that has not already been seen, though among some of the exhibits of transplanted cars, new ones, or, rather, differently finished ones, have been planted, and though nearly all of them are pretty to look at the hues of some of them and the comparative delicacy of their "trimmin's" suggests that sunshine was in the mind of the designer, or the painter, or whoever is responsible for the coloring, when the scheme was laid down on paper.

That cars of the kind appeal to the esthetic in the fair sex there can be no doubt, and as a rule the feminine chorus of "Oh-h-h's!" and "Ah-h-h's!" is echoed by the more masculine, though none the less appreciative, "Ain't it a peach?" There is one Oakland car in particular that always compels attention. It forms a veritable picture, for the good and sufficient reason that it is supposed to do so. The car itself is finished in a canary yellow with white striping and the "warmth" of coloring is further enhanced by pigskin upholstery and dull-finished metal parts. So much for the car, which, needless to add, is of the very latest vintage. Its surroundings consist of a large box-like structure completely lined with black velvet, having the front open and finished off in imitation of an im-

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mense gilt picture frame. The lights, of course, are inside the "cabinet" and are so placed and shaded that from a little distance the illusion is perfect. But by the way the crowds flocked up close to the picture frame—one impulsive youngster stepped within the magic square and was promptly and forcibly ejected—it would seem that illusions, no matter how perfect or how beautiful, are not appreciated by the show-going public.

Cars Displayed in Unusual Settings.

The Oakland, by the way, is one of the few that was not transplanted from a previous show. Evidently it was gotten up for the occasion, as were two Buicks—one finished completely in lavender and the other a chaste white—that are displayed in a manner a little more effective in keeping spectators out of the light provided to set them off. They are behind substantial brass rails.

Scarcely less conspicuous, though no special lighting or other display methods are employed to bring it to the attention of visitors, is a white Mercedes, which, with three or four Renaults, serves to give the show just a wee little bit of foreign flavor. One of the distinctive features of the Mercedes is the way the leather upholstery has been carried outside of its rightful domain clear down to the running boards between the bottom of the doors and the step, presumably to protect the paintwork from carelessly wielded feet.

Such newness as there is in the line of body building and painting, however, is very nearly submerged beneath the colors and the shapes that made both the New York and the Chicago shows. Thus, for instance, the speedy looking red Fiat roadster that occupied a prominent place in Grand Central Palace is very much in evidence. As was the case last year, the Fiat exhibit is the first one the visitor sees after passing the main gate. Following down the line, the eye lights first on a white Pope-Hartford roadster and quickly is drawn to an orange and black roadster exhibited beside it. Both of them are new among the other transplanted Pope-Hartford cars. Across the aisle, Columbia-Knights hold forth beside the newer Maxwells. And, of course, the sectioned Knight cylinder draws the crowd it always draws—until some one or other presses the starter button on the Maxwell engine and, with characteristic fickleness, it deserts the old new Knight engine for the new new electric starting system.

Motion Exhibits Not So Numerous.

Moving exhibits—cut away chassis and engines that run under the persuasion of electric motors—are scarcer at the Boston show than they were at either of the others, and it does not require very keen discernment to discover the influence of the electric starter in causing their demise. It is so easy to depress a button and cause the motor to whir—the gears whir quite loudly in some cases, too, and if the noise serves no other useful purpose it causes visitors to turn their heads—and the demonstration kills two birds with one stone, so to speak: It shows the engine in action and it demonstrates the starter. There are plenty of chassis, of course, though only one of them is shown with its parts in operation, and almost any one would be warranted in hazarding a guess at its name. It is the Cartercar which, with the exception of the little Metz, is the sole exponent of friction transmission on exhibition. Apparently, the salesman never tires of demonstrating the infinite variety of speeds that can be obtained with the simple apparatus.

The Chalmers "factory exhibit" has been moved in toto, even to the attendant in overalls, the only difference in its make-up being that a little more prominence is given to the table of parts and the testing methods employed in perfecting Chalmers parts. Also, the Rambler lecturer is there in all his glory, industriously pointing out the "high spots" of Rambler cars with a wary eye for chance acquaintances in the crowd that always gathers around him. Occasionally he varies his stereotyped remarks, but his wit seems to go even higher over the heads of the Bostonians than it did over the heads of natives of the Windy City, where last he held forth.

Cars That Have Made the Rounds.

Through the doors that join Grand Hall and Exhibition Hall there gleam two "eyes," one red and the other green, the "eyes" being the side lights on a brown Winton. They are properly mounted, too, as far as the nautical significance of their coloring goes, the green light being on the right side, which is starboard, and the red light being on the left side, which is port. Needless to add, they create an effect that is just a little different from anything else. Otherwise, the Winton exhibit is almost exactly as it was for the previous shows, and the like can be said for nearly every other exhibit in the hall. The great yellow Peerless double limousine with its peculiarly flared body is very much in evidence; the sedate and luxurious-appearing Pierce-Arrows, with their arched doorways, are just across the aisle; the newer crop of left-driven Loziers faces the Knoxes, and up at the end of the main aisle, almost in the shadow of the stage where, as usual, Packard and Cadillac hold forth supreme, there is the only limousine in the show in which there is apparent any real attempt at obtaining adequate ventilation of the body; it is the Alco that first made its appearance a year ago and it scarcely has changed a bit in the interim.

Familiar Names on Babylonian Turrets.

Looking down the hall through the tropical foliage from a vantage point on the stage, nothing but familiar names are in evidence. The White is nearest, with the Stevens-Duryea and the S. G. V. hard by. Two of the S. G. V. cars, by the way, are equipped with the U. S. L. electric lighting and engine starting system for the first time. A little further along there is the Mercer and the National and the Locomobile and the Haynes. Just outside the door there are the American, the Pullman, the Krit, Overland, the Speedwell, with its six-cylinder Mead engine, the Case, and with very few exceptions every other name familiar to the motoring pubilc and to a great percentage of it that does not motor. In the spacious basements that have been so well disguised that they do not look like basements at all, the names are just as familiar. The Studebaker cars, for instance, occupy a corner all to themselves on a raised platform; not far distant there is the Edwards-Knight, which is making its premier Boston appearance, and the Henderson and the Little and Chevrolet "sixes," the Michigans and the Imperials, the Jacksons and the Hupmobiles, one of them being high up on a raised dais. One of the most striking exhibits of all, however, is an underslung Regal which is tipped up so far that it has made more than one person gasp and wonder at its stability.

Among all this dimmed glamour, if such it may be termed, there are just nine cars that are making their initial appearance of the season, and among the nine there is at least one that is a real surprise. It is the K-D—the first product of the K-D Motor Co. It is built around a very much revised edition of Miss Margaret Knight's crescent valve engine, which made its first appearance at the last Boston show. Of the other eight, two are electrics, the Bailey and the Grinnell, one is a steamer, the Stanley, and the rest are gasolene cars—namely, Ford, Nyberg, Moyer, Packard and the little three-wheeled Kelsey motorette.

K-D Motor Displayed On a Car.

There is nothing of severity in the lines of the K-D car. It departs further from the accepted straight-line effect than any other car in the show, though the lines are pleasing withal and suggest not at all the multitudinous curves that help give the typical foreign car its outre appearance to American eyes. Yet the body has a decidedly foreign appearance that is heightened to a degree by its wire wheels and its unusual fender lines. The hood is long, to accommo-

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date its six-cylinder motor, and after the manner that apparently is coming into greater vogue, slopes gradually upward from the front to meet a slightly convex skuttle that is fairly deep. Thence back, the top body line has a distinct "deadrise," to employ a nautical term, which is to say that there is very flat but continuous curve with the higher points at the skuttle and the back of the rear seat. A single entrance on either side, with the hinges and the latches artfuly concealed, suffices.

Individual Adjustable Front Seats.

The seating arrangement provides accommodations for five passengers, three on the rear seat and two in individual adjustable chairs in front with a narrow passage between them. The steering wheel is at the right with the control levers placed within the body but not in the center. Tool storage space is provided beneath the deep skuttle and just at the front end of the rear cushion there are two small lockers, one on each side, for trinkets or goggles or gloves or anything else the passengers may see fit to put in them. They are provided with locks. An integral windshield is fitted and the close-fitting top, supported by only two bows placed at the rear, attaches to it. The front fenders fit very closely to the wheels and the rear fenders are continued further around the circle of the wheels than is usual.

K-D Motor, at First "Four," Now a "Six."

The motor is a K-D, of course, though it is a K-D that has very little in common with the predecessor that made its first appearance a year ago. In the first place it is a "six," whereas the other was a "four"; the bore and stroke remain the same, however, and are four inches and six inches, respectively. In the second place, the piston rods of the original motor have been eliminated, as has the method of leading the exhaust products back into the crankcase and beneath the pistons to assist them in the scavenging stroke. Hence, the internal economy of the motor, with the exception of the valves, of course, is not far removed in construction from that of the orthodox poppet-valve motor. The crescent-shaped valves and their method of actuation by means of individual crankshafts remain the same, though the method of mounting them has been altered slightly to permit of larger port area and better cooling facilities. The sleeves now receiprocate between two water-cooled surfaces, a deep recess in the cylinder head permitting a circulation of water between the cylinders and the liner against which the valves press.

Lubrication, as heretofore, is entirely by splash, and ignition is effected with the aid of a Mea high-tension magneto. In appearance, the revised K-D motor is only slightly less compact than the Knight engine, due to small extensions to permit movement of the valve-actuating crankshafts, and suggests it not a little. The single engine on view is not in the chassis but is shown in operation under the persuasion of an electric motor, and there were any number of those who viewed it when first set up who were loud in their regrets that at least one cylinder head had not been left off the better to show the valve action.



LOOKING TOWARDS THE STAGE AND THE "PORTALS" OF NEBUCHADNEZZAR'S PALACE

But One Six That Is Strictly New.

Of the other cars that appear for the first time this year, three are "sixes," though only one of them—the Moyer—is, strictly speaking, a new product. The others, the Packard and the Nyberg, both are refinements and improvements on previously existing models, though they are none the less interesting for that reason. The Moyer, however, is new all the way through, though it incorporates many of the features that

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always have served to distinguish the products of the old-line carriage making firm that produces it. In the older Moyer models there is a new steering gear, new body designs and the U. S. L. electric lighting and engine starting system has been added as standard equipment without increase in price.

The motor in the new "six" is of the more or less conventional T-head type, with the cylinders cast in pairs, but with the valve mechanism left open and uncovered to facilitate adjusting and grinding operations. The bore and stroke measure 4½ and 5 inches, respectively, and the power plant is supported at three points on the chassis frame. Among the other essential elements of the car are its large diameter cone clutch, its three-speed selectively operated gearset and its full-floating rear axle. The spring suspension includes semi-elliptic members both front and rear and, of course, the rear members are mounted and connected in the distinctive Moyer manner. Which is to say, the front and rear ends of the two rear springs are connected to solid transverse shafts which act as equalizers, causing the strain to be equally distributed over both and eliminating much of the disagreeable side sway. The new steering gear is of the well-known worm and full gear type and is irreversible. To obviate the annoying rattles which sometimes emanate from such parts, the control tubes are made with a brass tube between the inner and the other steel tubes telescoped together with a close fit.

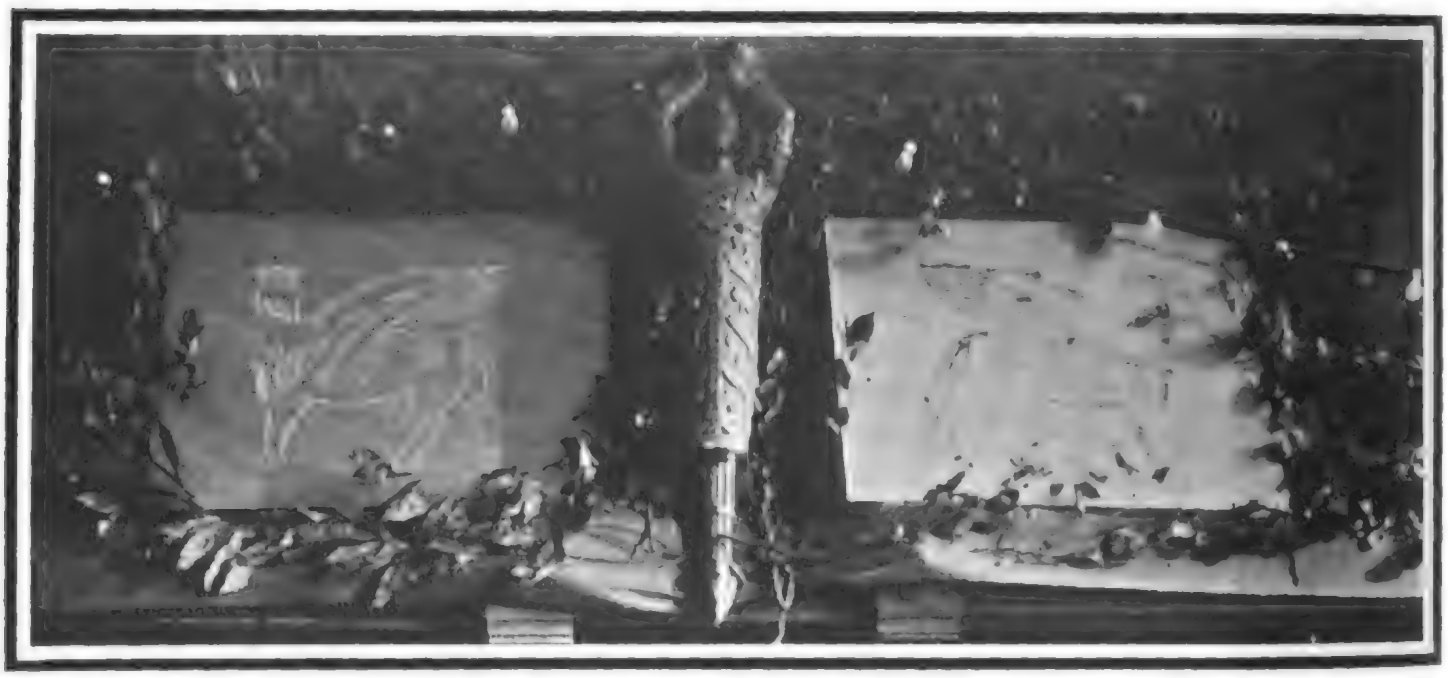
The new body styles that have been adopted differ from their predecessors primarily in that many of the unsightly angles and projecting parts have been eliminated. From a short skuttle, the top body line runs straight back without a break to the back of the rear seat and is approximately at the same level as the top line of the engine hood. In common with modern practice, the windshield is mounted without the use of a filler board and the struts are so placed as to obstruct the driver's vision as little as possible. Complete equipment is included in the selling price, quite as a matter of course.

Nyberg Adds Complete Electric Equipment.

The Nyberg, which, though last year exhibited nearer to its home town in Indiana, its annual appearance having been made at the Chicago show, this year was reserved for the Hub exhibition. Its engineers, too, have seen the light of the times—electric light, be it added—and have materially increased equipment by the adoption of a complete lighting and starting system. Which, briefly, is the only substantial alteration, if such it may be termed, that has been made since last the line was displayed. In both of the models displayed, a "six-45" five-passenger car and a "four-42," there is apparent a slight lengthening of wheelbases, a little lower hung frame to augment stability and a very considerable deepening of the upholstery by way of increasing the comfort of passengers. Incidentally, both of the bodies, or for that matter all of them, the rest of the line including a "six-60" and a "four-37," have taken on broad lighter-colored bands at the top body line, thus materially enhancing appearance.

As heretofore, all the motors are Rutenbers, the mere mention of the name serving as sufficient introduction to their qualities. In the larger "six" the cylinders are separately cast after the original Rutenber manner and in the little "six" they are pair cast. Similarly, in the larger of the "fours" the cylinders are separately cast, and in the other they are in pairs. In all of them cooling is by pump-circulated water and ignition is by the usual type of high-tension magneto.

In the design of the new bodies with which all the models have been fitted the straight-line effect is even more pronounced than it has been in the past, due, no doubt, to the addition of the encircling band. Strictly speaking, however, the band does not encircle the bodies; it ends at the front flush with the dashboard line and is at once a little different and a little more distinctive than the usual band which continues around the skuttle in an unbroken line. Another of the noteworthy features of the Nyberg line is that, though right-hand steering and control is standard and is supplied unless otherwise specified, left-hand steering with centrally located control levers may be had at the option of the purchaser.



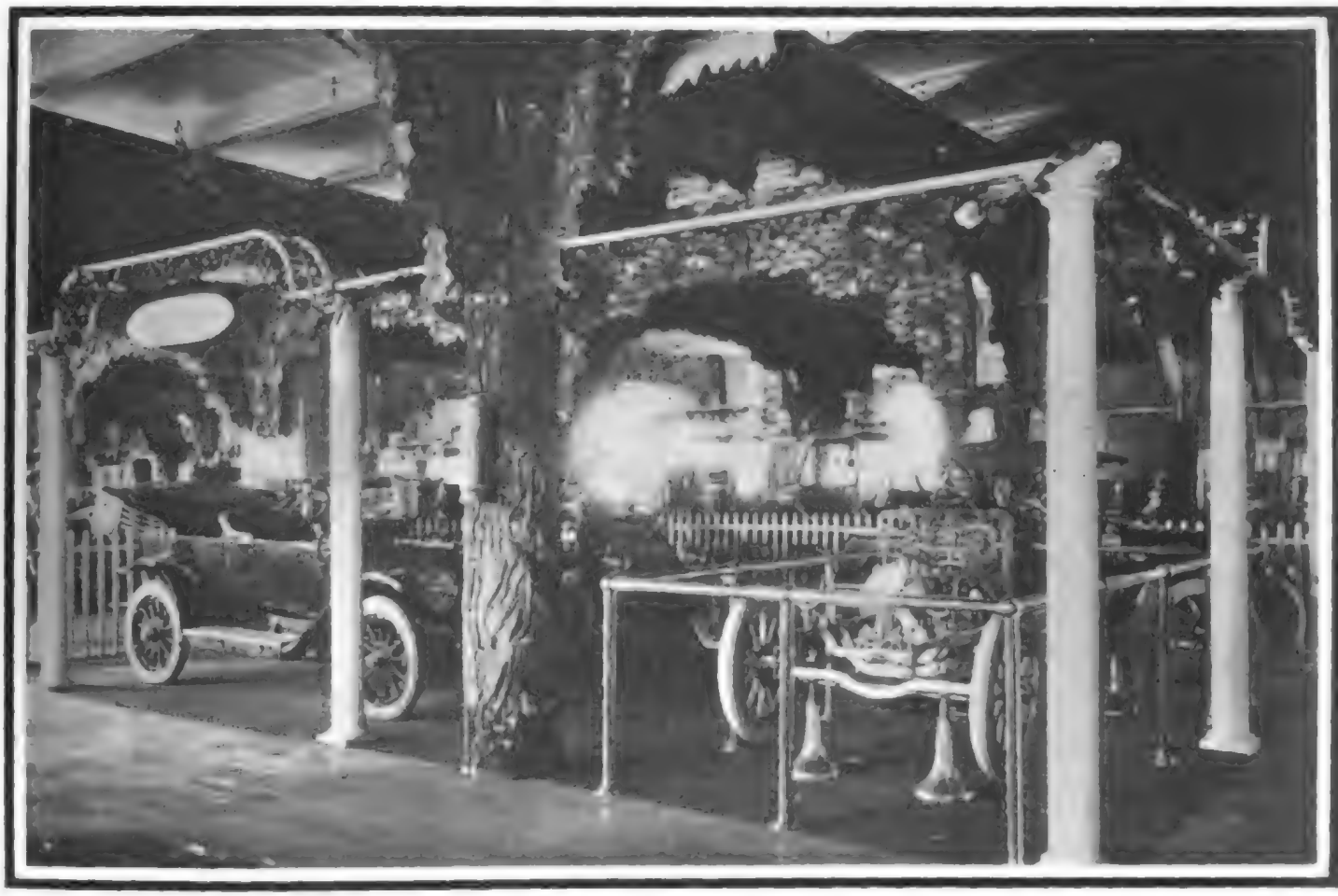
WINGED LIONS AND MUMMY THAT INCREASE THE EGYPTIAN FLAVOR

"Big Six" Packard Now Left Steered.

For the first time, left steering exclusively is a feature of all the cars in the Packard line, the newer "48," which appears for the first time, being the first of the revised Packard "big sixes" to be revealed to the general public. When the Packard company first brought out its "little six"—the "38"—it incorporated in it several radical departures from previous practice and incidentally let it be known that the im-

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provements over older designs which it represented soon would be incorporated in the larger "six" as well. Hence, it is no surprise that the "48" now has its steering column at the left side instead of the right, where it always has been in the past, and that the centralized control which is a feature of the "38" has been made a feature of the "48" as well. Though these two cars always have been as nearly alike in appearance as two peas in the same pod, the likeness is even more striking now than it ever has been, and it extends a great deal deeper in the construction.



CLOSE RANGE VIEW OF "A GARDEN OF A CENTURY AGO"—OVERLAND EXHIBIT IN FOREGROUND

Packard Adopts Lubrication Improvement.

Thus, for instance, though the motor remains substantially the same as it has been in the past, with its six cylinders cast in pairs with the valves on opposite sides, no little increase in efficiency has been obtained by adapting to it the supplementary forced feed lubrication system that first made its appearance on the "38." For ordinary running, all the internal parts are lubricated by splash and a gear driven pump, but directly the throttle is opened for a burst of speed, or for hard work on hills, the force feed system comes into action through interconnection with the throttle control; consequently, the amount of oil fed is in proportion to the size of the throttle opening and has no relation to the speed of the motor.

The centralized control also is familiar, and its advantages in permitting control and starting and stopping of the motor and the lighting of the lamps and carburetter adjustments, etc., without the necessity for the driver leaving his seat, are apparent. It has been adapted practically without change from the construction familiarized by the "38." The Delco electric lighting and engine starting system is retained, though ignition is furnished by a high tension Bosch magneto operating a dual system in conjunction with a storage battery.

Many New Body Styles Added.

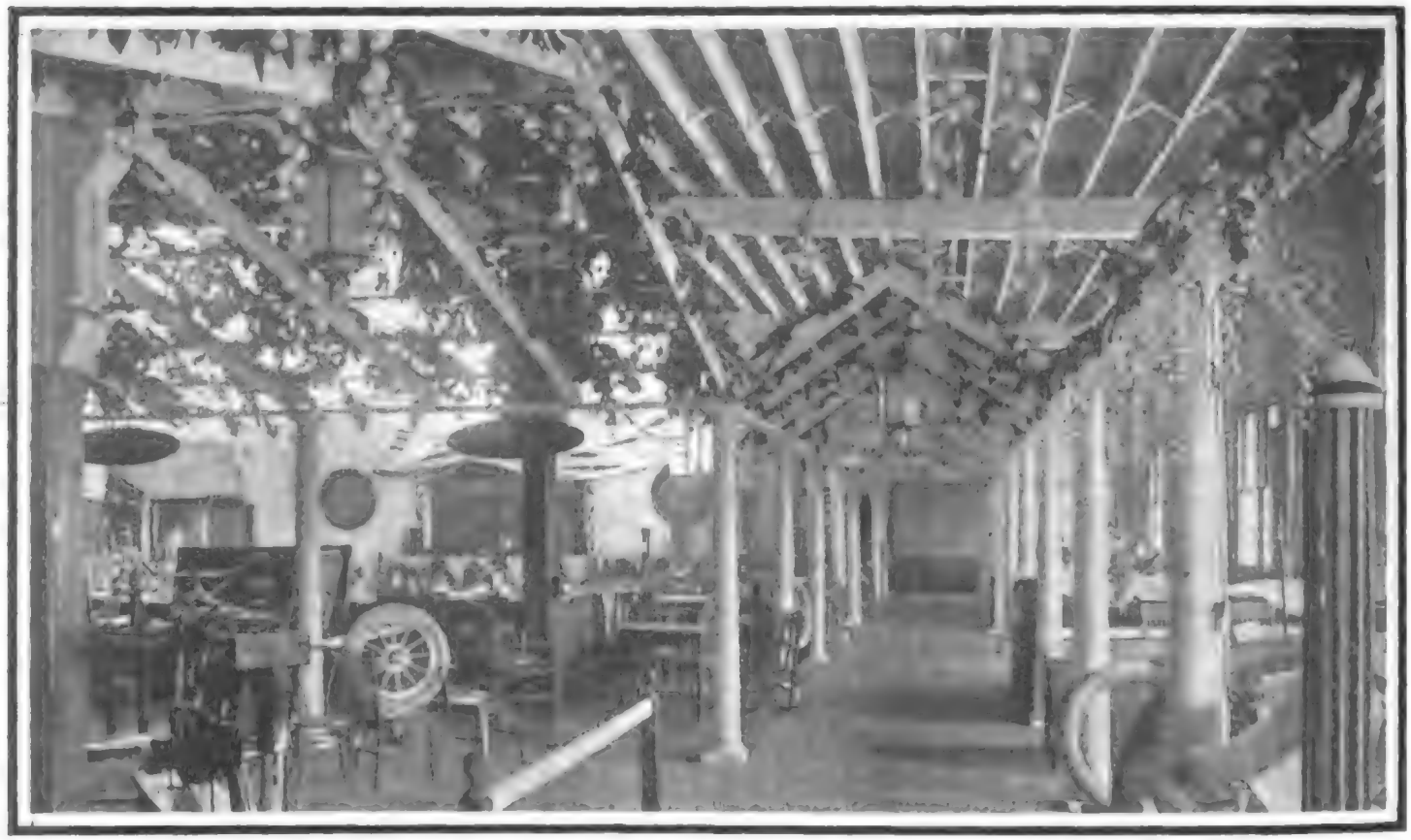
Filling out an already extensive line, several new body styles have been added. The phaeton-roadster is one of them; it has been designed primarily as a roadster body to fit the standard phaeton chassis which has a slightly longer wheelbase than the roadster chassis. The added space behind the seats is occupied by a liberal sized luggage compartment with large doors on either side. Extra tires are carried on the deck above the compartment. By a slight alteration in existing designs, either the brougham or the imperial limousine now may be had in either the double compartment type, providing a separate space for the driver, or in the "salon" type, in which the driver and the passengers are not separated. All of the open bodies are equipped with tonneau lamps arranged to illuminate the step, the location of the switch permitting the light to be turned on from the curb.

Of the three other brands of engine-propelled cars that have been reserved for the Boston exhibition—namely, the Ford, the Kelsey Motorette and the Stanley steamer—it is impossible to say anything in the same breath, so to speak; they are widely divergent types of vehicles. The Ford, as everyone knows, employs a compact four-cylinder motor, the Motorette has a twin-cylinder opposed motor, and the Stanley, of course, represents one of the last of the disappearing makes of vehicles propelled by the oldest known prime mover—the steam engine.

It is the same steam engine it always has been, too, though it now is made in one additional size which is rated at 10 horsepower. It is exactly like the larger engines, however—the "20" and the "30"—

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and employs two simple cylinders with link reversing mechanism. Making for extreme lightness and strength, the body is constructed entirely of aluminum and a further reduction of weight is permitted by the use of laminated wood sills instead of the usual metal members. Inasmuch as the steam engine is the only one of the prime movers that rightfully may be said to be self-starting, no other starting medium than the steam itself is necessary, though the equipment has been increased by the addition of a complete electric lighting system. One very



WISTARIA HUNG PERGOLAS THAT EMBELLISHED THE ACCESSORY GALLERY IN EXHIBITION HALL

important improvement in the boiler, which is of the fire tube type, has been made in the addition of a feed water heater which materially increases efficiency and permits greater mileage per tank of water than that obtained in the past.

The little Kelsey Motorette, which enjoys the distinction of being the only three-wheeler in the show, not counting the motorcycles, of course, looks just the same as it always has looked—provided the inspection is made from a distance. Closer examination, however, reveals one all-important and radical alteration from previous construction: it has a brand new 11-horsepower motor or the four-cycle type, though despite the evident improvement the price has been reduced to $300. The new motor is of the opposed type, with mechanically operated valves and the valve parts completely enclosed to make them dirt-proof It is water cooled by the thermo-siphon system. Like the orthodox four-cylinder automobile motor, the crankcase is made to do duty also as an oil reservoir, the lubricant being pumped over the main bearings, whence it drains down through a screen into a sump to re-commence its journey. Ignition is effected with the aid of a high-tension Bosch magneto. Steering, as heretofore, is accomplished with a lever, and the planetary gearset is retained intact, as are all the other essential elements of the car, with the exception of the motor. The driving wheel is at the rear, power being transmitted through the intermediary of a roller chain.

Ford Shows Body Refinements Only.

In the strict sense, the Boston show is not a National show, of course, and has nothing whatsoever to do with the preceding National shows in New York and Chicago, which accounts in a measure for the presence of the Ford, for Ford cars never are shown at the National shows. Still, the Boston show approaches the National shows in point of size at least, and the Ford exhibit in Boston is just as important there as it would be anywhere else. Altogether, there are four cars in the exhibit and, as might have been expected, they differ only in minor particulars from those that went before them, for in years gone by Ford cars have become pretty well standardized and, though slight refinements have been made from time to time as occasion warranted, there never has been any radical change in design. Which is just one reason why no one ever has any trouble in identifying a Ford on the road.

The alterations that have been made have to do only with the bodies and, though they are slight in extent, scarcely more than half an eye is needed to see that appearance has been materially benefited. In the touring body, for instance, the back has been slightly rounded out and given fuller curves that make for greater harmony of outline. Also the rear panel now is carried clear down to the fenders in an unbroken line and at the same time door latches have been relegated to less conspicuous places inside the body and very nearly all the brass work finished in black enamel. The most striking change is in the roadster model, however. Instead of being mounted at the back of the seats, together with a large tool box, the gasolene tank now is located beneath the seats and the space at the back has been decked over with a slanting deck which is hinged and covers a liberal sized tool and spare tube locker. One other change which has been made in both models is in the method of bracing the windshield. Instead of passing forward to the ends of the frame, the struts are very short and lead back to the top edge of the body. Incidentally, the windshield now

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rakes aft instead of being perpendicular, as it has been in the past. Together with the top and the horn and the acetylene generator and the speedometer it is included in the regular equipment just as it always has been.

In the matter of electric cars, the Boston show is a little more complete than was the New York exhibition, but not so complete as the Chicago show. Nearly all the well-known brands are there—the Waverly and the Detroit, the Rauch & Lang, and the Wood, the Borland and the Standard and others—and in addition there are two—the Grinnell and the Bailey—that were not shown at either of the previous big shows. Also, these two makes of car are about as far apart in the matter of construction and appearance as is possible.

The Grinnell, for instance, which is produced by the Grinnell Electric Car Co., of Detroit, Mich., is primarily a pleasure vehicle and it looks the part. Mechanical changes are few and far between, though one new model has been added to the line since last it was exhibited. The new model is styled a clear vision brougham, and its seating arrangement provides accommodations for five persons, all facing forward; the rear seat accommodates three persons and one other is seated at the side of the driver. The fifth seat beside the driver is a swiveling and folding chair which, when not in use, is completely out of the way, leaving the entrance to the driver's seat quite unobstructed. The drive, of course, is direct by shaft to the rear axle, with a single reduction, and the battery equipment is calculated to permit from 70 to 100 miles to be covered on a single charge.

Though the Bailey line also includes vehicles designed especially for pleasure service, one of which is a brand new model that just has been added, interest naturally centers around the fast, rakish appearing roadster which was designed as a sort of combined business and pleasure vehicle. To fill the demand for a more luxurious vehicle built along the same general lines but of better finish and better suited for pleasure, a new model almost exactly like it has been added.

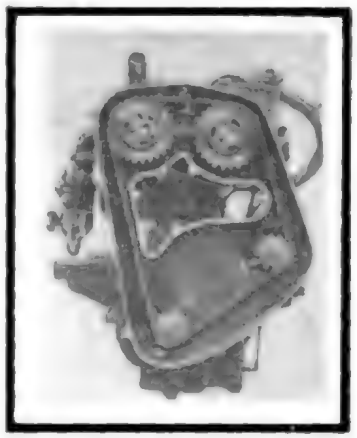
The most conspicuous point of difference between the old and the new is that in the latter the front battery hood lines extend right to the dash proper, to which the hood is attached firmly. The dash, mounting the doors, is hinged at the lower edge, permitting the hood to be raised for battery inspection, washing, etc. As heretofore, Edison batteries are used exclusively in all the models and the drive to the rear wheels by means of side chains from a countershaft is retained without change. With the usual equipment of 60 cells of A6 Edison battery, the new model lists at $2,900.

New Things That Cropped Up in the Accessory Department in Boston

Contrary to expectations, the Boston show does not live up to its reputation, gained in previous years, as a producer of much that is new in accessories. Only about 10 or a dozen really new devices are in evidence, and only one of them is designed to "put the pneumatic tire out of business," which may or may not be significant. Of the others, none is startling in either conception or construction, and in very few of them is there missing at least a hint of something else that has gone before and that borders dangerously near to being the very device that is on view.

Among a whole lot of other things which very freely are said to be brand new, for instance, there is the Elliott "Flexible Rotary Valve" engine. Actually, the engine is brand new, for it represents the very first product of the Elliott Motor Engine Co. of Waltham, Mass. However, it does not operate on a new principle, being a four-cycle machine of the four-cylinder type, nor is the arrangement of its rotary valves new, as any one can testify who has seen the Mead engine or the Henriod. What actual newness there is in the engine is in the form of its valves, their construction and their method of actuation.

Like the Mead engine, the usual poppet valves are replaced by longitudinal rotary members contained in pockets cast at the sides of the cylinders, exhaust on one side and intake on the other. Unlike the Mead engine, however, each of the longitudinal members is divided into four parts—one for each cylinder—and all are driven, each from its mate, by means of a single continuous roller chain which extends around the crankshaft and the magneto shaft and the valve driving sprockets which are located at and attached to the end member of each group of four valves. The valves themselves differ from the Mead engine valves



ELLIOTT ROTARY VALVE DRIVE

in that they are hollow and are split longitudinally in a line with the end of the port area, the object of the construction being



ELLIOTT FLEXIBLE ROTARY VALVE

to permit of a fairly tight fit while at the same time allowing for the necessary amount of expansion and contraction due to varying temperatures. Thus the valves are flexible to a certain extent, from which the reason for the name of the motor may be judged. Among the interesting claims that are made for the engine is that it can be constructed much more cheaply than any other form of engine, that it has fewer parts "than any other engine in the world," that it "will give 50 per cent. more power," and that it "uses but one-half the amount of gasolene of any of the standard makes of engines."

In the realm of lamps and signalling devices, one new rear signal, designed to permit the driver of a car to indicate to following drivers his intention to stop or to turn to the right or the left, appears. It is styled the Reliance Stop Signal and consists essentially of a small oblong box with a ground glass rear panel in which there are painted two arrows and the word "Stop." Three small buttons serve to switch on either of three lights to illuminate the right arrow or the left one or to illuminate both of them and the word "Stop." T. F. Russell & Co. exhibit an ingenious trouble lamp designed either to be held in the hand or attached to the hat or the clothing or to any part of the car by means of a projecting handle provided for the purpose. Except for the handle, it is the usual trouble lamp contained in a tiny cage to protect it from injury and equipped with a long, flexible cord and a plug; it is styled the "Pomo" lamp.

Though there are almost any number of attachments for converting acetylene head lamps so that they may be used as electric lamps, there are comparatively few devices of the kind for the conversion of side lamps. In view of this fact, and to supply the demand for small, low-cost electric side lamps

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that can be attached by any one, the Standard Auto Supply Co. has developed and exhibits several systems of the kind designed to be operated by dry cells. The lamps are small and light and their attachment requires merely the driving of a couple of screws and the running of the necessary wires. "Driver" lamps, they are styled, and they come in a variety of styles and at a variety of prices that in no case are high. The lamps are fitted with tungsten bulbs, parabolic reflectors and imported lenses.

One of the few real novelties of the show is exhibited by Donal N. Macdonald, in the form of leaded glass panels in colors to take the place of the usual front or side glasses in lamps. A variety of designs are shown, including initials and conventional designs, and it is pointed out that in addi-

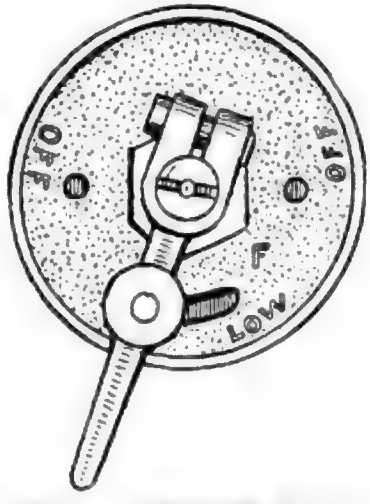


POMO TROUBLE LAMP

tion to adding a touch of individuality and providing a more certain mark of identification than the usual monogram on the sides of the doors, the leaded glass panels may be made to serve as head lamp dimmers on occasion. Otherwise they can be so designed that they interfere but slightly with the required brilliancy. Any design can be built into a panel, whether it be monogram, crest or just plain initials.

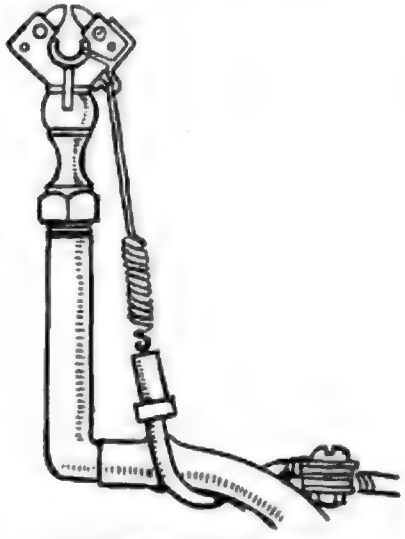
The Dunn-Ray lighter is exhibited for the first time and is, as its name suggests, a device for lighting acetylene head lamps from the driver's seat. It differs from the usual device of the kind, however, in that it employs no high tension current. Instead of a spark, the Dunn-Ray lighter relies upon a tiny incandescent wire, suitably attached to the burner, to ignite the gas; two dry cells furnish sufficient current to heat the wire. The rest of the apparatus consists of a combined switch and valve to be mounted on the dash, rotation of a small handle serving to turn the flame up or down, according to the requirements of the driver.

Among the various signalling devices that are exhibited—the Klaxons and the Long horns and the Tutos and Rexos and others—two new ones are on view, one of them being an electrical device which is claimed



DUNN-RAY ACETYLENE VALVE

to be one of the few that has a really "gentlemanly" tone, and the other is an exhaust horn that has been developed primarily for Ford cars. The former is the Reacto horn, produced by the Holtzer-Cabot Electric Co., and the latter is the Tremo, shown by the D. Henry Bonner Co. of Cambridge. The Reacto horn is of the usual vibrating type, the armature of

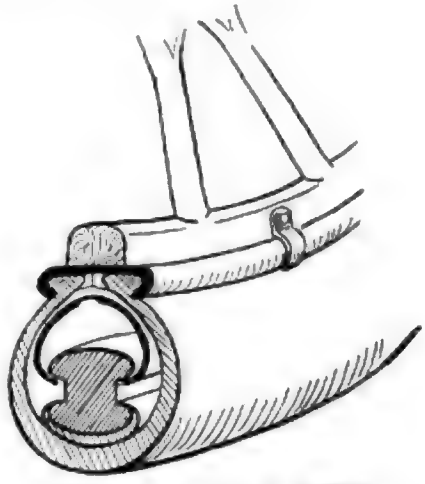


DUNN-RAY LAMP LIGHTER

an electro-magnet striking against the diaphragm. Its "gentlemanly" tone, it is pointed out, is due almost entirely to the care with which the materials entering into its make-up have been selected and the proper proportioning of weight of the parts. It is designed to operate on a six-volt battery, though it will sound effectively through the range from 4½ to 8 volts; its price is $10.

The Tremo exhaust horn also is of the usual pattern, though it has been designed to permit of a perfectly clear exhaust when the horn is inoperative. It is attached by merely slipping its shank over the end of the exhaust type and tightening a single clamping screw. It is made in a variety of sizes.

To help spark the motor, two new devices are exhibited, one of them being the J & B Junior master vibrator, exhibited by the J & B Mfg. Co., and the other being the Benton spark plug, which is produced and exhibited by the L. F. Benton Co. of Vergennes, Vt. The J & B Junior master vibrator is essentially a smaller and lower-priced version of the standard size J & B vibrator that has been on the market for some time. It is designed to be "floated on the line" between the ordinary low-tension magneto and the usual dash coil, thus enabling the existing ignition switch to be



EXPANSION TIRE IN SECTION

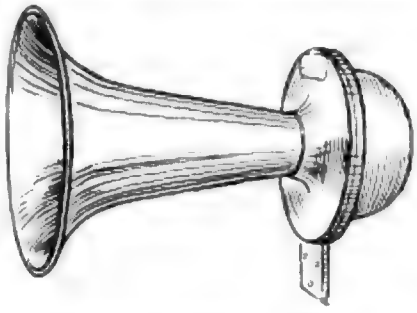
retained. It is ruggedly constructed and is water- and dirt-proof. The Benton spark plug is unusual in that it employs both mica and porcelain insulation and the metal parts are case hardened—in fact, the case hardening is made a strong talking point, its makers dubbing the Benton "the case hardened plug." The insulator is composed of sheet mica, spirally wound by a special process and forced under great pressure into a taper hole in the case hardened bushing; outside the mica, between the body of the plug and the terminal, German porcelain is baked on. The electrodes are of extra heavy wire drawn from an alloy of platinum and nickel, the shell member being continuous and passing from one side to the other around the center member.

The removal of carbon deposit from the pistons and combustion spaces of motors long has constituted a problem, though the Ozo Co., which exhibits the Ozo carbon destroying outfit, makes light of it; it makes light of both the carbon and the work,

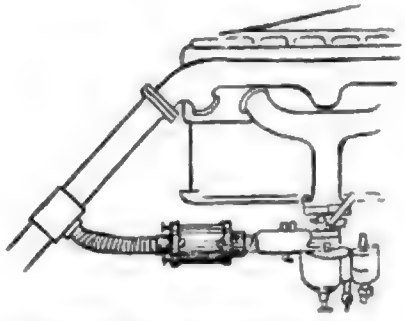
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which is to say, it consumes the carbon by burning it. Briefly, the apparatus consists of nothing more complicated than a cylinder of oxygen, a second cylinder containing a purifying chemical through which the oxygen is passed, a suitable controlling valve and a length of flexible metal tubing. The modus operandi is to insert the flexible tube in the cylinder, preferably through a valve cap opening, and permit the purified oxygen to come in contact with the glowing particles of carbon, which burn up and disappear. It is claimed that the average four-cylinder motor can be cleaned of carbon in from 20 to 30 minutes and at a surprisingly low cost.

The single device designed to cause pneumatic tire makers to worry is an ingenious arrangement of alternate segments of rubber and a non-compressible material in a continuous band fastened within the usual outer casing by means of a metal clamp which serves to prevent the beads of the tire from coming out of their grooves in the wheel rim. Resiliency is imparted both by the rubber in the band and by the metal spring. Vertical shocks are partly absorbed by the rubber an dpartly transferred circumferentially to the hub. The device is styled the Expansion Tire and is produced by the Expansion Spring Rim & Tire Co. of Boston.



REACTO ELECTRIC HORN



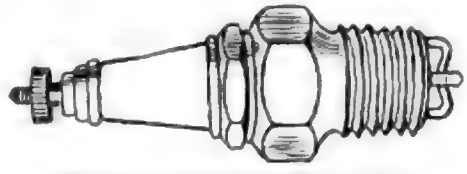
ARNOLD AIR HEATER APPLIED

By way of assisting cold motors to start, the Arnold Electric Co. has developed and exhibits a small electric heater designed to be attached to the air intake of the carburetter, the idea being to preheat the air and thus to assist in the vaporization of the fuel.

In its simplest aspect it consists of a series of coils of high resistance wire enclosed in a casing in such a way that the entering air is forced to pass over them. The coils are heated by the current from a six-volt storage battery, and as the device is in use only for a very short time and at comparatively long intervals the current consumption is slight.

Celfix is the name of a preparation exhibited by the Woodman Sales Co. that has been produced for the purpose of permitting quick and easy repairs in the celluloid windows in side curtains and in windshields. It is a fluid and is applied with a brush; virtually, it is liquid celluloid, or such it appears, for breaks mended on the spot scarcely could be determined, so close was the union.

No inconsiderable number of tools for the motorist's kit put in an appearance, though of them all none is more ingenious than a monkey wrench exhibited by the Globe Wrench Co. After the manner of all monkey wrenches, the jaw is adjustable though the method of moving it is different from any other method. The actuating mechanism is contained within the handle of the wrench; merely turning the handle suffices to bring the jaws closer together or to separate them.



BENTON "CASE-HARDENED" PLUG

Summary of the Pleasure Cars on View and Their Exhibitors

Anderson Electric Car Co., Detroit, Mich.—Two Detroit electric cars: one each coupe and collapsible coupe.

American Locomotive Co., Providence, R. I.—Two six-cylinder Alco cars: one each double limousine and touring car and one chassis.

Andrews-Dykeman Co., Boston—Two four-cylinder Moon touring cars and one each four-cylinder Detroiter touring car, roadster and chassis.

American Motor Car Co., Boston—Two four-cylinder Marion touring cars, two four-cylinder American touring cars and one four-cylinder American roadster.

Bailey & Co., Inc., S. R., Boston—Three Bailey electric cars: two roadsters and one coupe.

Borland-Grannis Co., Chicago, Ill.—One Borland electric brougham; one chassis.

Bowman Co., J. W., Boston—Four six-cylinder Stevens-Duryea cars: two touring cars, one roadster, one limousine and one chassis; two four-cylinder S. G. V. cars: one each limousine and roadster and one chassis; one Waverley electric brougham.

Buick Motor Co., Flint, Mich.—Five four-cylinder Buick cars: four touring cars, one roadster and one chassis.

Binney, J. A., Boston—Two four-cylinder Henderson cars: one each touring car and roadster.

Cadillac Automobile Co., Boston—Five four-cylinder Cadillac touring cars: three touring cars, one each coupe and limousine and one chassis.

Clark-Carter Automobile Co., Jackson, Mich.—Two four-cylinder Carter cars: one each touring car and roadster; one chassis.

Connell & McKone Co., Boston—Three four-cylinder Overland cars: two touring cars, one roadster and one chassis.

Curtis-Hawkins Co., Boston—Four Speedwell cars: two four-cylinder touring cars, two six-cylinder touring cars and one six-cylinder Mead engine chassis.

Case T. M. Co., J. I., Racine, Wis.—Three four-cylinder Case cars: two touring cars and one roadster.

Cutting Motor Car Co., Boston—Three four-cylinder Cutting cars: one each touring car, roadster and racing car.

Dutton Motor Car Co., F. A., Boston—Four four-cylinder Abbott-Detroit cars: three touring cars and one roadster.

Dodge Motor Vehicle Co., Boston—Two Buffalo electric cars: one each brougham and roadster.

Donovan Motor Car Co., Boston—Five Studebaker cars: two four-cylinder touring cars and one four-cylinder coupe; one each six-cylinder touring car and limousine; one four-cylinder chassis.

Davis Carriage Co., Geo. W., Richmond, Ind.—One four-cylinder Davis touring car.

Edwards Motor Car Co., New York City—One four-cylinder Edwards-Knight touring car and one chassis.

Fiat Motor Sales Co., Boston—Five Fiat cars: two four-cylinder roadsters and one four-cylinder touring car; two six-cylinder touring cars and one six-cylinder chassis.

Ford Motor Co., Boston—Four four-cylinder Ford cars: two touring cars and one each roadster and landaulet.

Franklin Motor Car Co., Boston—Three six-cylinder Franklin cars: one roadster and two touring cars.

Fuller, Alvin T., Boston—Seven Packard cars: two six-cylinder roadsters, two limousines, one double limousine, one roadster and one four-cylinder touring car.

Habich Co., G. E. & H. J., Boston—Four Cole cars: one four-cylinder touring car, two six-cylinder touring cars and one six-cylinder chassis.

Harrington-Thompson Motor Cars, Inc.,

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Boston—Two four-cylinder Krit cars: one each roadster and touring car and one chassis.

Henley-Kimball Co., Boston—Two Hudson cars: one each four- and six-cylinder touring cars and one six-cylinder chassis.

Hollander Motor Co., Boston—Two four-cylinder Metz roadsters and one chassis.

Hoyt Carburetter & Auto Co., Boston—Three four-cylinder Havers touring cars: two roadsters and one touring car; one chassis.

Imperial Motor Car Co., Boston—One six-cylinder Imperial touring car.

Inter-State Automobile Co., Boston—Three Inter-State cars: two four-cylinder touring cars, one six-cylinder touring car and one six-cylinder chassis.

Jackson Motor Car Co., Boston—Four four-cylinder Jackson cars: three touring cars and one roadster.

K-D Motor Co., Boston—One six-cylinder touring car with K-D sliding crescent valve motor.

Jeffery Co., Thomas B., Boston—Four four-cylinder Rambler cars: two touring cars and one each double limousine and roadster; one chassis.

Koehler Sporting Goods Co., H. J., Boston—Four four-cylinder Hupmobiles: two touring cars and one each coupe and roadster.

Lawrence & Stanley Co., Boston—Two Mitchell cars: one each four- and six-cylinder touring cars and one six-cylinder chassis.

Linscott Motor Co., Boston—Four four-cylinder Reo cars: two touring cars, one limousine and one roadster; one chassis.

Locomobile Co. of America, Boston—Six six-cylinder Locomobile cars: four touring cars, one limousine and one double limousine; one chassis.

Lozier Motor Co., Boston—Four six-cylinder Lozier cars: three touring cars and one double limousine.

Lenox Motor Car Co., Boston—Four four-cylinder Lenox cars: three touring cars and one roadster; one chassis.

Marathon Motor Works, Nashville, Tenn.—Three four-cylinder Marathon cars: two touring cars and one roadster.

Maxwell Motor Co., Boston—Three four-cylinder Columbia-Knight touring cars, one four-cylinder Maxwell touring car and one four-cylinder Maxwell roadster.

MacAlman, J. H., Boston—Four Stearns-Knight cars: one six-cylinder touring car, two four-cylinder touring cars and one four-cylinder limousine.

Maguire Co., J. W., Boston—Six six-cylinder Pierce-Arrow cars: four touring cars, one roadster and one limousine; one chassis.

Moline Automobile Co., East Moline, Ill.—One four-cylinder Moline touring car.

McFarlan Motor Car Co., Connersville, Ind.—Four six-cylinder McFarlan cars: three touring cars and one roadster; one chassis.

Michigan Motor Car Co., Kalamazoo, Mich.—Three four-cylinder Michigan cars: two touring cars and one roadster; one chassis.

Morse & Co., Alfred Cutler, Boston—One four-cylinder Mercedes touring car; one each Renault touring car, limousine and chassis, all four-cylinder.

Motor Car Mfg. Co., Indianapolis, Ind.—Five four-cylinder Pathfinder cars: two touring cars, three roadsters; one chassis.

Moyer, H. A., Syracuse, N. Y.—One six-cylinder Moyer touring car; one four-cylinder chassis.

Nyberg Automobile Works, Anderson, Ind.—Two Nyberg cars: one each four- and six-cylinder touring cars.

Oakland Motor Co., Boston—Four Oakland cars: two four-cylinder touring cars and one four-cylinder roadster; one each six-cylinder touring car and roadster.

Oldsmobile Co. of Massachusetts, Boston—Three Oldsmobiles: two six-cylinder touring cars and one four-cylinder touring car.

Peerless Motor Car Co. of New England, Boston—Six six-cylinder Peerless cars: four touring cars and two double limousines.

Paige-Detroit Motor Car Co., Detroit, Mich.—One four-cylinder Paige-Detroit touring car.

Pope Mfg. Co., Hartford, Conn.—Six Pope-Hartford cars: one each six-cylinder roadster and touring car, two four-cylinder touring cars and one each four-cylinder roadster and limousine.

Premier Motor Car Co., of New England, Boston—Three six-cylinder Premier cars: one each touring car, roadster and limousine; one chassis.

Proctor, G. H., Boston—One four-cylinder Pullman touring car.

R. C. H. Corp., Detroit, Mich.—Two four-cylinder R. C. H. cars: One each touring car and roadster; one chassis; one Hupp-Yeats electric double limousine.

Republic Motor Co., of Massachusetts, Boston—Two Little cars: One each four- and six-cylinder touring cars. One each six-cylinder Chevrolet touring car and chassis.

R & L Co., Boston—Four six-cylinder Garford cars: Three touring cars and one roadster; one chassis.

Russell Co., W. L., Boston—Six four-cylinder Regal cars: Four touring cars, one coupe and one roadster; one chassis. Two four-cylinder Haynes touring cars; one chassis.

Smith, Fred S., Boston—Two four-cylinder Mercer cars: One each touring car and roadster.

Standard Electric Car Co., Boston—One Standard electrique coupe.

Stanley Motor Carriage Co., Newton, Mass.—Four Stanley steam touring cars and one roadster.

Stevens, W. H., Boston—Four four-cylinder National cars: two touring cars and two roadsters; one chassis.

Stutz Motor Car Co., Boston—Four six-cylinder Stutz cars: Three roadsters and one touring car; one chassis.

Tiffany & Co., D. C., Boston—Two Rauch & Lang electric cars: One each roadster and limousine.

Tyler Bros. Corp., Boston—One Kelsey Motorette. One Columbus electric brougham.

Underhill Co., Boston—Five Knox cars: Two six-cylinder touring cars; one each four-cylinder touring car, roadster and limousine; one six-cylinder chassis. One Grinnell electric brougham.

Velie Motor Vehicle Co., Boston—Three four-cylinder Velie cars: Two touring cars and one roadster.

White Co., Boston—Seven White cars: One six-cylinder double limousine, two six-cylinder touring cars, two four-cylinder touring cars and one each four-cylinder collapsible coupe and roadster.

Whitten-Gilmore Co., Boston—Eight Chalmers cars: Two six-cylinder touring cars; three four-cylinder touring cars, one roadster and one limousine. Two Woods electric coupes.

Wing Motor Car Co., F. E., Boston—Five Marmon cars: One each four-cylinder roadster and limousine and two touring cars; one each six-cylinder touring car and chassis.

Winton Motor Carriage Co., Boston—Six six-cylinder Winton cars: Five touring cars and one limousine.

Westcott Motors Co., Boston—Three Westcott cars: One each six-cylinder touring car and roadster; one four-cylinder touring car.

The 158 Accessory Exhibitors and the Wares They Display

*Signifies will remain for Commercial Vehicle Show.

Adams & Co., J. Q., Boston—Dictionaries.

Aetna Life Insurance Co., Boston—Insurance.

Arnold Electric Co., Boston — Kellogg pumps and starters and electric manifold heaters.

Ajax-Grieb Rubber Co., New York City—Ajax tires.*

Allen Wrench & Tool Co., Providence, R. I.—Allen friction tools.

American Storage Battery Co., Cambridge, Mass.—Harvard batteries.

Arnold, N. B., Brooklyn, N. Y.—Slikup cleaning and polishing preparations.

Austin & Doten, Boston—Shelby steel tubing.*

Automobile Supply Mfg. Co., Brooklyn, N. Y.—Newtone and Electra horns.

Auto Parts Co., Providence, R. I.—Specialties for Ford cars.

American Kushion Kore Tire Co., New York City—Tire fillers.

Batavia Rubber Co., Batavia, N. Y.—Batavia tires.*

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Baums Castorine Co., Rome, N. Y.—Soaps and polishes.
Bell, Bayers & Woodbury, Boston—Lighting systems for cars and garages.*
Benton Co., L. F., Vergennes, Vt.—Benton spark plugs.
Blackledge Mfg. Co., J. W., Chicago, Ill.—Velvet auxiliary springs.
Boston Tire & Rubber Co., Boston—Nassau tires and Thermoid reliners.
Bowser & Co., S. F., Fort Wayne, Ind.—Gasolene and oil storage systems.*
Boyd, Shirley F., Boston—R. I. V. ball bearings.*
Burn Boston Battery Mfg. Works, Boston—Burn Boston batteries.
Brock Rubber Co., Boston—Hose and rubber specialties.
Cataract Rubber Co., Boston — Cataract tires.
Champion Ignition Co., Flint, Mich.—A-C spark plugs.*
Chandler & Farquhar Co., Boston—Machine tools.
Clark Foundry Co., Rumford, Me.—Machine tools.*
Coes Wrench Co., Worcester, Mass.—Wrenches.*
Columbia Lubricants Co., New York City—Monogram lubricants.
Columbia Tire & Top Co., Boston—Tires and tops.
Connell & McKone Co., Boston—Pittsfield ignition devices, Schebler carburetters, lamps and jacks, etc.*
Connell, W. J., Boston—Gabriel horns and rebound snubbers.
Cox Brass Mfg. Co., Albany, N. Y.—Windshields.
Cook's Son, Adam, New York City—Albany lubricants.
Coward Auto Supply Co., Boston—Aplco starting and lighting systems.
Cramp & Sons Ship & Engine Bldg. Co., Philadelphia, Pa.—Parsons white bronze bearing metal and worm gearing.*
C. R. G. Mfg. Co., Saugus, Mass.—C. R. G. carburetters.
Crowell Chemical Co., Beverly, Mass.—Oxford polishes.
Doehler Die Casting Co., Brooklyn, N. Y.—Die cast parts.
Dayton Airless Tire Co., Dayton, Ohio—Dayton tires.
Daniels, Smalley, Boston—Sly tire holders and tool boxes, Vulcan springs, Boreas windshields, etc.
Dean Electric Co., Elyria, Ohio—Tuto and Rexo horns, Dynalux lighting systems, Elyria-Dean and Otho starting and lighting systems, Elyria-Dean speedometers, etc.*
Diamond Rubber Co., Akron, Ohio—Diamond tires.*
Dixon Crucible Co., Jos., Jersey City, N. J.—Graphite lubricants.*
Double Fabric Tire Co., Auburn, Ind.—Tire liners.
Dover Stamping & Mfg. Co., Cambridge, Mass.—Saval funnels and measures and other sheet metal specialties.
Dunn-Ray Co., Boston—Electric headlight lighters.
Eagle Oil & Supply Co., Boston, Mass.—Lubricants.
Eavenson & Sons, Inc., J., Camden, N. J.—Jesco soaps and polishes.*
Edison Storage Battery Co., West Orange, N. J.—Edison batteries.*
Eisner-Lenk Co., Boston—Eisemann magnetos.
Electric Storage Battery Co., Philadelphia, Pa.—Exide batteries.*
Empire Rubber & Tire Co., Trenton, N. J.—Empire tires.
Endurance Tire & Rubber Co., New York City—Endurance red inner tubes.
Elliott Motor Engine Co., Waltham, Mass.—Elliott motors.
Ernsdale Worsted Co., Clinton, Mass.—Fabrics.
Fairbanks Co., Boston—Machine tools.
Federal Rubber Mfg. Co., Cudahy, Wis.—Federal tires.
Firestone Tire & Rubber Co., Akron, Ohio—Firestone tires.*
Fisk Rubber Co., Chicopee Falls, Mass.—Fisk tires.*
Findeisen & Kropf Mfg. Co., Chicago, Ill.—Rayfield carburetters.
Ford Co., Percy, Boston—Tires, tubes and vulcanizers.
Flentje, Ernest, Cambridge, Mass. — Hydraulic shock absorbers.
Forbes, Walter J., Boston, Mass.—Knojar shock absorbers, and K-W ignition devices.
Goodrich Co., B. F., Akron, Ohio—Goodrich tires.*
Goodyear Tire & Rubber Co., Akron, Ohio—Goodyear tires.*
Gray & Davis, Inc., Amesbury, Mass.—Electric starting and lighting systems and lamps.*
Grady & Co., J. W., Worcester, Mass.—Excelsior, Henderson and Dayton motorcycles.
Globe Wrench Co., Ipswich, Mass.—Wrenches.*
Harris Oil Co., A. W., Providence, R. I.—Lubricants.*
Hartford Suspension Co., Jersey City, N. J.—Truffault Hartford shock absorbers, Hartford jacks and bumpers and electric starting and lighting systems.*
Havoline Oil Co., New York City—Havoline lubricants.
Haws, George A., New York City—Panhard lubricants.
Heinze Electric Co., Lowell, Mass.—Heinze magnetos and other ignition devices.*
Hillman Auto Supply Mfg. Co., Boston—Lamps, radiators, etc.
Hoffecker Co., Boston—Hoffecker Steady Hand speedometers.
Holden, George N., Boston—Indian motorcycles.
Holtzer-Cabot Electric Co., Brookline, Mass. — Electric lighting systems and Newcomb carburetters and Reacto electric horns.
Homo Co. of America, Philadelphia, Pa.—Homo carburetters.
Holt & Beebe Co., Boston—Lamps and electrical specialties.
Hood Rubber Co., Boston—Shawmut tires.
Hopewell Bros., Newton, Mass.—Tool bags, tire covers, etc.
Houk Co., Geo. W., Philadelphia, Pa.—Wire wheels.
Ingersoll Rand Co., New York City—Pumps and compressors.
International Acheson Graphite Co., Niagara Falls, N. Y.—Oildag and Gredag lubricants.
International Metal Polish Co., New York City—Blue Ribbon polishes.
Invader Oil Co., Boston—Invader lubricants.
Jaeger Co., C. J., Boston—Marine motors.
J. M. Shock Absorber Co., Philadelphia, Pa.—J. M. shock absorbers.
Jones Speedometer, New Rochelle, N. Y.—Jones speedometers and recorders.
Justice Co., A. R., Philadelphia, Pa.—U-Kan-Plate polishes.
K. D. Motor Co., Brookline, Mass.—K. D. motors.
Kelleher, J. J., Dorchester, Mass.—Typhoon signals.
Keystone Lubricating Co., Boston—Keystone lubricants.
Kilham, J. F., Beverley, Mass.—Yale motorcycles.
Kelly-Springfield Tire Co., New York City—Kelly-Springfield tires.*
Lapoint Co., J. N., New London, Conn.—Machine tools.
Leather Tire Goods Co., Niagara Falls, N. Y.—Woodworth treads and repair boots.
Lee Tire & Rubber Co., Conshohocken, Pa.—Lee and Leland tires and Waymaker horns.
Linscott Supply Co., Boston—Supplies.
Lovell-McConnell Mfg. Co., Newark, N. J.—Klaxon horns and Conover safeguards.
Lunt-Moss Co., Boston — Pumping and lighting plants.
Laidlaw, Wm. R., Jr., New York City—Top fabrics.
McCue Co., Buffalo, N. Y.—McCue axles and wire wheels.
MacDonald, Donald M., Boston—Leaded glass for lamps.
Marburg Bros., Inc., New York City—Mea magnetos, S. R. O. ball bearings, Marburg-Hagen springs.*
Miller, Chas. E., New York City—Pan American oils, Brampton chains and other supplies.
Moore-Smith Co., Boston—Clothing.
Morrison-Ricker Co., Grinnell, Ia.—Grinnell gloves.
Mossberg Co., Frank, Attleboro, Mass.—Wrenches.
Motor Parts Co., Philadelphia, Pa.—Auto Cle wrenches.*
Motz Tire & Rubber Co., Akron, Ohio—Motz cushion tires.*
MacDonnell-Webster Co., Haverhill, Mass.—Scientific inner tubes.*
National Coil Co., Lansing, Mich.—National magnetos and other ignition devices.
New Departure Mfg. Co., Bristol, Conn.—New Departure ball bearings.
N. Y. & N. J. Lubricants Co., New York City—Columbia lubricants.
New England Motorcycle Co., Boston—Harley-Davidson and Pope motorcycles.

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Orona Mfg. Co., Boston—Perfumery.
Pantosote Co., New York City—Pantasote top coverings.
Perfection Filler Co., Somerville, Mass.—Tire fillers.*
Pennsylvania Rubber Co., Jeanette, Pa.—Pennsylvania tires.*
Philadelphia Grease Mfg. Co., Boston—Lubricants.
Piel Co., G., Long Island City, N. Y.—Long horns and G. P. Muffler cut-outs.
Pyrene Co. of New England, Boston—Pyrene Fire extinguishers.
Presto Inter Rim Co., Boston—Presto rims.
Peacock Co., Clarence N., New York City—Ames shock absorbers.
Randall-Faichney Co., Boston, Mass.—Jericho and Jubilee exhaust horns, Webster tank gauges, etc.
Reinhart, George W., Boston—Specialties.
Reliance Speedometer Co., Boston—Reliance speedometers.
Remy Electric Co., Anderson, Ind.—Remy magnetos and electric lighting and starting systems.
Republic Rubber Co., Youngstown, Ohio—Republic tires.
Ricker-Bennett Co., Cambridge, Mass.—Paints.
Robinson & Son, Wm. C., Boston—Lubricants.*
Rose, P. R., Boston—Microscopes.
Russell Co., T. F.—Morse lighting appliances, Macquic tools, Fire Death fire extinguishers, etc.
Sages Trunk Co., Boston—Trunks.
Salman, John A., Boston—Monograms, etc.
Sawyer Oil Co., Howard B., Boston—Lubricants.
Schoen-Jackson Co., Media, Pa.—Feps carburetters and flexible metallic tubing.
Seamless Rubber Co., Boston—Seamless tires.
Shannon, T. R., Boston—Polishes.
Shaler Co., C. A., Waupun, Wis.—Vulcanizers.
Simms Magneto Co., New York City—Simms magnetos and S. U. carburetters.
Splitdorf Electrical Co., Newark, N. J.—Splitdorf magnetos and other ignition devices and electric lighting systems.*
Standard Auto Supply Co., Boston—Lighting outfits.
Standard Thermometer Co., Boston—Standard speedometers and Abell tire pumps.
Standard Tire & Rubber Co., Boston—Standard tires.
Standard Woven Fabric Co., Worcester, Mass.—Brake linings.
Standard Welding Co., Cleveland, Ohio—Electrically welded tubing and parts.*
Stewart & Clark Mfg. Co., Chicago, Ill.—Stewart speedometers.*
Stromberg Motor Devices Co., Chicago, Ill.—Stromberg carburetters.
Swinehart Tire & Rubber Co., Akron, Ohio—Swinehart tires.*
Texas Co., New York City—Texaco lubricants.*
Tobey, Wm. L., Boston—Rim and glare removers.
Townsend & Co., S. P., Orange, N. J.—Grease guns.
Tyer Rubber Co., Andover, Mass.—Tyrian tires.
Underhay Oil Co., Boston—Lubricants.
United Rim Co., Akron, Ohio—Universal rims.*
U. S. Light & Heating Co., New York City—U-S-L starting and lighting systems.*
United States Tire Co., New York City—United States tires.*
Vacuum Oil Co., New York City—Mobil lubricants.*
Valentine & Co., New York City—Varnishes.
Veeder Mfg. Co., Hartford, Conn.—Tachometers, odometers and die cast parts.*
Vesta Accumulator Co., Chicago, Ill.—Vesta batteries and lighting systems.*
Voorhees Rubber Mfg. Co., Jersey City, N. J.—Brown inner tubes.
Walker Lithograph & Pub. Co., Boston—Maps.
Walpole Tire & Rubber Co., Boston—Walpole tires.
Ward & Sons, Edgar T., Boston—Tool steels, etc.
Warner Instrument Co., Beloit, Wis.—Warner Autometers.*
Weed Chain Tire Grip Co., Boston—Weed chains.
White & Bagley Co., Boston—Oilzum lubricants.
Willard Storage Battery Co., Cleveland, Ohio—I.BA batteries.*
Winship, W. W., Boston—Trunks.
Wolverine Lubricants Co., New York City—Wolverine lubricants.*
Woodman Sales Co., Boston—Celfix celluloid cement.
Wayne Oil Tank & Pump Co., Ft. Wayne, Ind.—Gasolene and oil storage systems.

Trucks That Follow Pleasure Cars.

When at the end of the three days—March 16, 17 and 18—permitted for moving out pleasure cars and rolling in commercial vehicles, Mechanics Building in Boston again is opened, the 46 exhibits of utilitarian machines will be surrounded and set off by the same decorations that are doing duty for the touring cars and runabouts. Advance information indicates that Boston will follow the lead of other important shows in showing nothing startlingly new, though there always is the off chance of a surprise. There will be a representative gathering of trucks from the lightest to the heaviest, to say nothing of the usual accessories. The show will remain open until Saturday night, March 19th.

The following commercial vehicles will be exhibited: Alco, Autocar, Atlantic electrics, Adams, Atterbury, Bessemer, Buick, Buffalo electrics; Chase, Couple-gear electrics, Decatur, Edison eelctrics, Federal, Flanders, General Vehicle electrics, G. M. C. electrics, Hupmobile, I. H. C., Knox, Kelly-Springfield, Little Giant, Locomobile, Lauth-Juergens, Lippard-Stewart, Mercury, Marmon, Overland, Packard, Peerless, Pierce-Arrow, Pope-Hartford, Reo, Speedwell, Stewart, Sanford, Stanley steamers, Smith-Milwaukee, Sowers, Sullivan, Schacht, Universal, Victor, Velie, Vulcan, Waverley electrics, White.

Lambert's Wonderful Flight Confirmed.

Despite the fact that it seems almost like accomplishing the impossible, mail advices confirm the cabled reports that on February 15th last Percy Lambert, driving a 25-horsepower Talbot on the 2½-mile speedway at Brooklands, England, covered 103 miles 1,470 yards in an hour, an average of 34.6 seconds per mile. The wonderful feat was accomplished—he set out to cover 100 miles within a span of 60 minutes—on the second attempt, the first of which was run on the Saturday previous, 8th ult., having resulted in a failure through the bursting of a rear tire on the last few laps. He however set up a new world's record for the half century, covering the distance in 29:10.5, or at the rate of 102.83 miles an hour. On the second attempt this record was lowered to 29:02.5, the rate being 103.4 miles an hour. One hundred miles were completed in 57:49.38 without mishap, the second time.

Although rated at 25 horsepower, the Talbot motor, which has a bore and stroke of 4.35 inches and 5.54 inches, respectively, figures out at 47.5 horsepower under the A. L. A. M. formula. At 2,500 revolutions a minute, the speed at which the motor operated when driving the car at the record-breaking speed, such was the design of the motor that it developed fully 2½ times this power—125 horsepower.

Elgin Sets Dates and Revises Program.

If things at Elgin, Ill., go according to the tentative program as mapped out by the Elgin Road Race Association, the fourth annual speed carnival over the local course will embrace the two days, Friday and Saturday, August 29th and 30th, and but a single race will be run on each day. On the first day of the meet the Ira J. Cobe trophy will be contested for, with the President's cup and the Jencks trophy, both of which were contested for in separate events last year, as second and third prizes, respectively. The Elgin National trophy will be the award for the victor in the second day's contest and the second and third man will receive the Illinois trophy and the Aurora trophy, respectively. Separate races also were run with these prizes as awards last year.

Savannah Dealers Form Association.

The dealers of Savannah, Ga., have formed the Savannah Automobile Dealers' Association. The temporary chairman who will direct affairs until the organization is completed is J. E. Finney.

BUFFALO COMMERCIAL SHOW FOLLOWS CARS BY A MONTH

Trucks Displayed in Red and White Trimmed Auditorium—Four Newcomers Among Twenty-seven Exhibitors.

Contrary to the usual order of things, the commercial vehicle section of the Buffalo Automobile Dealers' Association's annual show is being staged a little over a month later than the pleasure car section instead of during the following week. It was inaugurated on Tuesday evening last, March 11th, in the Broadway Auditorium—suitably adorned in red and white for the occasion—and will continue throughout the remainder of the week, until Saturday evening next, March 15th.

The show comprises 38 different makes of trucks displayed by 27 dealers and manufacturers; of the number, seven—Buffalo electric, Lippard-Stewart, Pierce-Arrow, Stewart, Kopp, Meyer and Willet—are local products. The three latter and the Coleman, which is shown by F. A. Ballou, are further distinguished in that it is their "first time out," so to speak, not having made their appearance previously during the present show season. Accessories are shown by eight dealers in motor car appurtenances and 11 different makes of motorcycles are on view, shown by half a dozen motorcycle dealers.

The trucks on view are: Atterbury, Kissel, Buffalo electric, Grabowsky, Coleman, Federal, Standard, Jeffery, Chase, Pope-Hartford, Alco, Studebaker, Mack, Saurer, Universal, I-H-C, Little Giant, Kopp, White, Lippard-Stewart, Sullivan, Marathon, Meyer, Overland, Packard, Pierce-Arrow, Autocar, Stewart, Menominee, Adams, Mais, Bessemer, Velie, Blair, Krebs, Commerce, Willet.

Forty Iowa Dealers Display Sixty Cars.

For the first time in the four years it has been staged, the exhibit of the Des Moines Automobile Dealers' Association has acquired proportions which necessitated separating the pleasure and commercial car displays. Part I, which comprised the pleasure cars, closed its doors in the Coliseum on Saturday evening last, March 8th, having held the boards for six days, from Monday evening, March 3rd.

The displays—60 different makes were shown by the 40 dealers who held space—revealed at least two makes of cars which are interesting in that they have not been previously exhibited during the present show season. They are the De Sota, a "six" of conventional lines which is made in Des Moines by the De Sota Motor Co., and the Zimmermann, product of the Zimmermann Mfg. Co., of Auburn, Ind. Accessory dealers to the number of twenty displayed the wares they handle.

The cars on view were: Cutting, Midland, Columbus electric, Imperial, Great-Western, Crow-Elkhart, Lambert, Maxwell, Ohio electric, Lozier, Buick, Moon, American, Hupmobile, Cartercar, Empire, Jackson, Metz, Cole, Studebaker, White, Rambler, De Sota, Ford, Chalmers, National, Woods electric, Oakland, Auburn, Velie, Reo, Apperson, Nyberg, King, Case, Detroit electric, Packard, Regal, Cadillac, Haynes, Detroiter, Hudson, Krit, Marathon, Marmon, Paige, Havers, Overland, Marion, Pierce-Arrow, Mitchell, R. C. H., Winton, Davis, White, Studebaker, Zimmermann, Colby, Michigan, Moline.

Sioux City Show on Three Floors.

Twenty-two dealers who had on display 33 different makes of motor vehicles for both pleasure and commercial use in the Bennett Building at Sioux City, Ia., comprised the fourth annual show of the Sioux City Automobile Dealers' Association which closed its doors on Saturday evening last, March 8th, after a six-day run. In the matter of decorations, the building is not one that lends itself readily to the purpose of the decorator; however, the three floors which are occupied by the display were "dressed up" with draperies and pennants galore. The cars on display were: Cole, Haynes, Locomobile, Studebaker, Empire, Velie, Reo, Cadillac, Cartercar, Metz, Rambler, Buick, Abbott-Detroit, Ohio, Auburn, Chalmers, Herreshoff, White, Moon, Cutting, Pullman, Krit, Matheson, Kissel, I-H-C truck, Imperial, Paige, Mitchell, Oakland, Ford, Michigan, Hudson, Oakland, Marion.

A. C. A. Seeks a "Social" Clubhouse.

Having reached the point where its business affairs, which means its garage and its testing laboratory, interfere seriously with its purely social life, the Automobile Club of America, at the last meeting of the Board of Governors, decided to divorce these several interests, not only in spirit, but in fact as well and to seek other and more appropriate club facilities in a new location on Fifth avenue. The garage and the rest of the business interests will remain in the big building on West 54th street, but a committee consisting of A. J. Hemphill, Henry R. Taylor, Henry Sanderson, James A. Blair, Jr., and Dave H. Morris, has been appointed to choose a suitable Fifth avenue location, though whether the club will build or will lease a building already constructed is a matter which as yet has not been decided.

LOUISVILLE DISPLAYS CARS IN "STONE-WALLED" BOOTHS

Imitation Masonry and Iron Fences Divide Exhibits at Kentucky Exhibition — Twenty-five Dealers Display Forty-two Cars.

Although the sixth annual show of the Louisville Automobile Dealers' Association, which held the boards in the State Armory, lasted only four days, from Wednesday evening, March 5th, until Saturday evening, 8th inst., that it was not a year-long institution could not be judged from the nature of the decorations which rendered the interior of the building eye-pleasing. Ashlar walls topped with iron picket fences served to mark off the various booths and to edge the gallery which served for the display of the accessories, while imitation stone walls improvised from suitably painted fireproof fabric on wooden frames obscured all view of the real walls of the drill hall. Both the surrounding walls and the separating walls were garnished with sprays of green oak. Green and white draperies hid the ceiling girders and served to soften the glow from the myriad incandescent lights and the dozen or more arc lights which dispersed the last traces of gloom.

In the booths of the 25 dealers who exhibited motor vehicles were the products of some 42 different factories, and of the number, one, the Transit truck, is a local product. It is made by the Transit Motor Truck Co. Two new products in the shape of the Helical shock absorber and the Speedway tire—the latter a brand new Louisville production—came to light in the displays of the dozen accessory dealers who occupied space. The shock absorber is of the conventional helical type, the springs being enclosed to eliminate dust and dirt; it is also manufactured by a local concern, the Helical Shock Absorber Co.

The cars shown were: American, Buick, Cadillac, Case, Chalmers, Cole, Detroiter, Hudson, Hupmobile, Interstate, Locomobile, Lozier, Maxwell, McFarlan, Oakland, Overland, Packard, Paige-Detroit, Peerless, Pierce-Arrow, Premier, Rambler, Regal, Reo, Stearns, Studebaker, Stutz, White, Winton, and Baker, Chicago, Detroit, Ohio, Rauch & Long, Waverley and Woods electrics. The trucks were: Federal, Packard, Rambler, Studebaker, Transit, Urban.

Wire Mesh to Strengthen Gaskets.

A gasket made of asbestos packing can be made to answer its purpose for a considerable time without blowing out if a similarly shaped piece of wire mesh is placed in position with it.

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TREMENDOUS LOAD HAULED BY HYDRAULIC DRIVE TRUCK

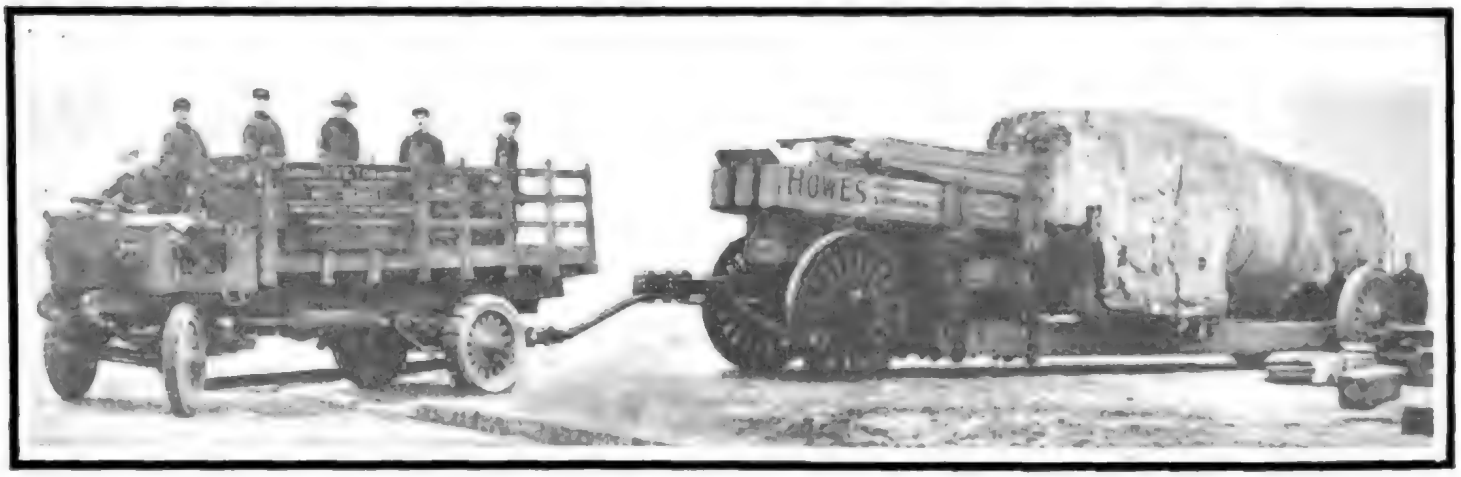
Demonstration that Served to Bring to Light Unusual Tractive Effort—Total Weight Moved, Forty-five Tons.

One of the objections that sometimes is raised by truckmen and other users of horses when approached on the subject of motor haulage is that, while the carrying capacity of the machine is as a matter of necessity kept within strict limits, a horse-drawn truck will carry "all you can pile on it"—that is to say, as long as the horses are able to move it. The endeavor to carry this old horse truck practice into motor trucking—in other words, overloading—has led to almost countless failures and disappointments.

But while the makers of trucks are drawing their maximum limitations closer than ever, the increasing power and reliability of the machines is indicated by the increasing use of trailers, which make it possible to utilize the abundant pulling power when the limit of carrying capacity has been reached. An example of this kind is found in the recent haul made by a La France hydraulic transmision truck, which had its tractive powers tested to an unusual extent.

The truck, of a rated carrying capacity of six tons, was loaded with six tons of boiler fittings and coupled by means of a heavy drawbar to the front end of a huge contractors' truck of the type employed for the transportation of large boilers and other exceptionally heavy material. Upon the contractors' truck, which weighs 12½ tons without load, was placed a boiler weighing 23 tons, making the total weight of trailer and load 35½ tons; the total weight moved, including the La France truck and its load of boiler fittings, was 45 tons.

The whole weigthy outfit, which is shown in the accompanying illustration, was hauled from 19th street and Second avenue to 68th street and East River, going up Broadway to 59th street. The rate of speed approximated four miles an hour and the work was done without any particular difficulty, the truck and its bulky trailer being at all times under complete control. The job was undertaken by the Hydraulic Truck Sales So., of 1777 Broadway, New York City, which handles the La France machine, for the Howes Transportation & Trucking Co., of New York, in order to demonstrate the capacity of the machine. To do the work in the customary way would have called for the use of 20 horses, making an extremely long and awkward procession, and one difficult to handle on short turns. The time required wolud have been at least double the time taken by the hydraulic truck to make the trip.



LA FRANCE MANLY HYDRAULIC DRIVE TRUCK WITH ITS MAMMOTH FORTY-ONE-TON LOAD

Boston to Motorize Fire Department.

Boston has taken the first step toward the complete motorization of its fire department. It already has several motor vehicles in use, but the fire commissioner just has recommended that the city council make an appropriation of $300,000 in order to carry out the contemplated motorization within a period of two years. As the mayor and city council are in accord with the idea, the adoption of the fire commissioner's recommendation is practically assured. He figures that with $300,000 he can purchase 51 distinct pieces of motor driven fire apparatus, in addition to repair trucks and runabouts.

Where Mud Splashing is Punishable.

When driving along muddy roads in Saxony, there are two alternatives open to the motorist: He must either confine his speed to a walking pace or wait till the mud dries up or freezes. Otherwise he is liable to run foul of the laws, for the German courts hold mud-splashing to be a punishable offense. The latest case to be heard by the Dresden Court of Appeals resulted in acquittal for the driver, for though he was adjudged to have committed an offense against the traffic regulations in that he did not slow down when passing through mud, he was dismissed with a reprimand for the simple reason that no one was near enough to be spattered. Few others get off, however.

Texaco's Chief Chemist Discusses Gasolene.

Advocating in no uncertain terms the development of devices that will permit the burning of some fuel other than gasolene in present types of automobile motors, H. Tipper, who is the chief chemist of the Texas Co., and who did most of the talking at the joint "gasolene" meeting of the Indiana Section of the Society of Automobile Engineers and the Hoozier Motor Club, held in Indianapolis Monday night, 11th inst., virtually placed the burden of the whole problem on the shoulders of carburation experts. It is Tipper's opinion, and the opinion of a great many others as well, that the problem is rather one of burning existing fuels than of developing or discovering new ones, and by way of bringing the argument home he offered the somewhat startling information that the cost alone of refining the future naphtha production would reach the figure of $75,000,000 in the case of one manufacturer alone. It is the actual cost of refining the fuel, as much as the shortage of crude oil, that enters into the problem, he said.

Indiana's Anti-Testing Bill Recalled.

Although it had passed both houses of the Indiana legislature, the protests of the automobile interests have proved sufficiently effective to cause the recall of the bill prohibiting the use of testing cars on the highways of that State. It proved to be more drastic than its authors supposed and, as a result, a new and modified measure will be introduced

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tion of the length of the blade, of course; it may show level in one direction and not in another. This is no drawback, however, because the blade can be shifted around so as to indicate in any line. A tool to indicate in all directions at once should be made with a flat base and a single point over which the bob would poise on a level surface, but would move away from in the direction of any downward tilt.

One Use for Which the Tool Serves.

One of the uses to which the tool can be put is squaring up a piston with the crankshaft, or indicating a bend in a connecting rod. The shaft first is leveled carefully, after which the tool is applied to the piston. Owing to the fact that many pistons are tapered, or may be worn, it hardly is safe to apply the vertical edge of the square to the side of the piston, though this can be done if the piston is known to be parallel. If the top is concaved or perfectly flat the square can be applied there; otherwise a straight-edge should be placed across the bottom of the piston and the square placed on top of the straight-edge. If the piston is true with the shaft there should be no discrepancy in the readings of the bob. It goes without saying that in making such a test the bearings at both ends of the connecting rod must be closely fitted and without looseness if the readings are to be of any use.

As to dimensions, a good all-round tool may be about six inches long on the blade and eight inches on the upright. For extreme accuracy the upright, and consequently the plumb-line, should be made longer. Clearly the higher the point of attachment of the line the greater will be the deflection of the point for a given error. For the all-round tool the arched upright should be of 5/16-inch square stock and the blade about an inch or an inch and an eighth wide.

Smoothing Surfaces by Draw-Filing.

One of the easiest methods of getting a fairly smooth surface on a piece of metal is to draw-file it. Draw-filing consists of holding the file by the ends and drawing it sideways along the work; the cut is much smoother and finer than its ordinary cut. After draw-filing with a file a piece of crocus cloth may be put on a stick and used in the same way to give a final finish.

Hardening Sharp-Pointed Tools.

Heating the point of a scriber, or any other sharp point, for hardening, must be done very carefully if the point is not to be burned. The heat should be applied a little distance back of the point until the red gradually extends to the point. To harden, jab the heated steel into a piece of wax or a potato and let it cool there.

CONDUCTING DEALERSHIP AS A BUSINESSLIKE BUSINESS

More Required Than Getting Agency and Then Waiting for Sales, Says Cole Man—Coordinating Selling and Advertising.

Making a dealership a real business, conducted in a business-like way instead merely of maintaining an agency and trusting to the dollars to roll in more or less of their own accord is a principle which the present leaders in the trade have grasped and which those who hope to travel the upward path must incorporate in their business doings. Recently, when H. C. Bradfield, of the Cole Motor Car Co., of Indianapolis, was visiting dealers on the Pacific Coast he found conditions there such as to arouse the enthusiasm of the man who delights in a fructifiable territory and in talking for the benefit of Cole dealers and Cole dealers-to-be he concisely expressed a few facts of vital trade interest, also touching upon the relations between dealer and factory.

Automobile Business With Big "B."

"The possibilities for expansion in the motor car industry are wonderful," he said; "that is, for the man who is ambitious, for the man who is in the automobile business, spelled with a big 'B.'

"The day of being in the motor car trade and having an agency and salesrooms, just to be in some line of work, has passed, and now only those who are heart and soul in the work can hope for success.

"People who nowadays purchase motor cars are going to the dealer who not only has elegant and commodious salesrooms, but to the man who, in addition, employs a competent sales and service force, and gives his clients real service under all conditions.

Combined Selling and Advertising.

"The successful automobile dealer is the one who co-ordinates his salesmanship and advertising. The automobile merchant is making money becaues he pays the proper attention to all the angles of his business, especially to advertising. This is really an essential element, for it is one in which a great deal of money can be easily wasted without adequate returns, thus making the dealer discouraged.

"To advertise properly the first essential is to give advertising attention. It must not be done mechanically. The automobile dealer must not try to pass off the spending of money to the automobile factory. He must delegate to himself, or one of his salesmen, this important part of the business. There is not a concern but what has somebody in its force who is partial to advertising, and only needs a little encouragement to show it. Once you get this man interested he will be able to write an intelligent advertisement. He will be able to put that newspaper human interest in his advertisements the same as a reporter puts in his story. He will localize his advertising. He will make it pull business.

Publicity and Real Advertising.

"Advertising is divided into two classes—publicity and pulling advertising. The first gets your name before the public, but without care it can be easily abused and do more harm than good. Pulling advertising interests the prospect, brings him to you to inquire about the car. It gets him to the salesroom, then its mission stops; for no advertising carries a possibility of being in a signed order, except in very rare occasions. If after the advertisement brings the prospects, the dealer does not close, it is the fault of salesmanship or his confidence in his product.

"The automobile merchant is in business, not in a game, and he is getting more and more adapted to these conditions, and thus he is able to give better service.

"Salesmanship in the automobile industry is a big factor. The man who can take an order under almost impossibilities is a salesman. He is the man who does not hang around the salesrooms. You never find him selling motor cars with his foot on the brass rail. Then there is the service question. This can also be much abused. The dealers in the automobile business are giving this department of their work proper attention, and getting results, because they conduct it from the business standpoint.

General Promotion Right Attitude.

"Last, but not least, the real good automobile dealer is looking after the industry from the general promotion standpoint. He is looking out to help the industry in general, whenever he gets an opportunity. That is one thing that is putting the Indianapolis made cars so firmly on the market.

"This co-operation of the big factories has done much for the general advancement of the trade and will continue to improve automobile conditions all over the country.

"The Western field is a good one for the motor car business and getting better each year. The factories realize this and are trying in every way to co-operate with their dealers in every field, to the end that business may be taken care of with as little friction as possible.

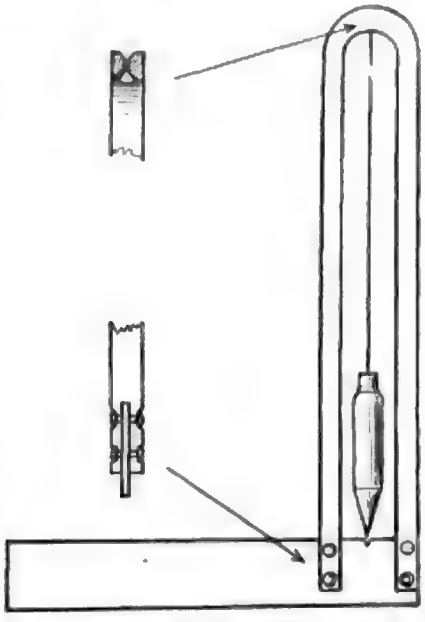
"The factories are now almost past the experiment phase of their career and consequently devoting more time and attention to where their products go."

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ONE OF THE TOOLS THAT FATHER USED TO MAKE

Making Gravitation Help in Doing Accurate Work—Combined Square and Level That Serves Sundry Purposes.

That almost extinct species, the old-time all-round mechanic, did not have the opportunities for stocking his tool-chest with factory-made tools such as are now so readily obtained. The variety of tools sold used to be much less extensive than it now is, and it was a matter of course that a man's tools were in many cases of his own make—and they were by no means poor tools, either. Every mechanic worthy of the name knew how to "originate" a surface-



CONSTRUCTION OF THE LEVEL

plate or a straight-edge, and it was considered an unnecessary expenditure of money to buy squares, surface gauges, calipers, and so on. In fact, it was rather the fashion to look down upon "bought tools" as less likely to be accurate than the home-made articles.

Handy Tool That Is Easily Made.

While good tools now are comparatively inexpensive and may be had of an accuracy difficult to equal in hand-made tools, there are not a few that are readily made up in spare time, and there is no gainsaying the fact that a man takes a certain pride in the use of a well-made instrument of his own production. The combined square and level shown in the accompanying illustrations is a case in point; it is by no means difficult to make, but it is very accurate and can be made useful in many ways. Used as a square only, it is like any other square, but used as a level it is considerably more accurate than a spirit level of the ordinary type, and for extremely fine work its construction can be made such as to multiply errors and so give exceedingly close readings.

In the construction of the tool the first and the main thing to do is to make a square, as shown, with a steel blade carrying an arched upright of square-section stock, preferably steel, though brass can be used if desired. Steel is much stiffer, of course, and is less liable to accidental damage. The feet of the arch should be carefully split with a hack-saw and the blade let in and riveted with rivets which fill the holes very closely, so as to avoid all possibility of misplacement once the tool has been trued up.

Making and Assembling the Parts.

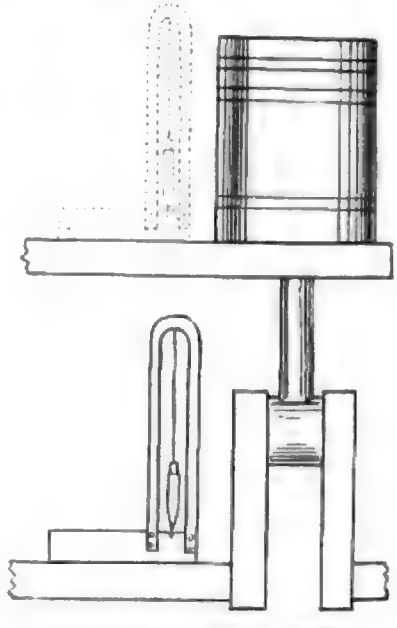
When the arch is made it is necessary to use great care to get the two legs absolutely parallel; otherwise if the square is true on the outside it will be "out" on the inside, and vice versa. This can be done with the aid of a pair of calipers. After getting the legs almost exactly parallel, the outside and inside faces should be made perfectly straight and true, using a surface plate or a true straight-edge for the purpose, after which the final paralleling can be done. The position of the arch on the blade may be varied by cutting one of the slits a little deeper than the other; by this means the two parts can be set together almost exactly at right angles. When the riveting up has been done there should be little to do beyond a very slight final truing up. Whatever metal has to be removed should be taken from the foot of the blade, the top of the blade being made parallel to it afterwards, if necessary. If the work has not been accurately done and the legs of the arch are not parallel when riveted in place, the outside face will have to be cut down to bring it true to the inside face, and then the blade trued to the arch.

At the center of the bend of the arch a very small hole should be drilled and countersunk at both ends; the countersinks should be smooth, without burring or sharp edges to fray the line, which is threaded through the hole and retained by a knot which drops into the top countersink; the line must be a close fit in the hole—the closer the better. Perhaps the best possible thing to use for the plumb bob is a small mercury bob—a steel shell filled with mercury and tightly sealed. However, any small bob will answer the purpose.

Accurate Finish Essential.

It is absolutely essential that the bob should be accurate—that is, its point must be exactly in the same axis as the line from which it hangs. Twist the line a little to rotate the bob; if it is true the point will turn without shifting its position, but if it is not true the point will wobble about in a little circle. A mercury plumb bob rarely is inaccurate.

The last job is to locate the "notch" which corresponds to the center line of a spirit level. To do this it is necessary to set the tool on a surface that is known to be absolutely level, or to set it up in a vise with its foot truly horizontal and the upright truly vertical. In most instances the latter is the easiest method, for a plumb-line can be used to line up the vertical edge. This must be done with extreme care and the line must be a very fine one; a piece of thread answers the purpose very well. Another method is to use the line of the tool itself, calipering from the outer edge of the



METHOD OF USING LEVEL

arched member to the line; but this is rather a difficult and delicate job.

When the tool has been leveled, with the plumb bob hanging so that it comes as close as possible to the top of the blade without quite touching, a fine mark should be made to indicate the point, and a tiny notch filed. Or a point may be attached to the blade, making, perhaps, a little better job of it; the point, of course, should project upward. The line used should be fine, tough and pliable, such as a bit of small high-grade fishing line.

Some Practical Applications.

Obviously if the tool is set on a level surface the plumb bob will come to rest with its point over the center of the notch in the blade, while if the surface is not level the point will be off either to one side or the other. This tool indicates only in the direc-

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INFLUENCE OF SIMPLICITY IN STARTER DESIGN

Lack of Complexity That Permits the Average Man to Care for His Own Equipment—Knowledge Required for the Operation—Jesco Combined Lighting and Starting System as an Example in Point.

(This is the twenty-second of a series of articles designed to make clear the electric lighting and engine starting systems in use and to render easier their care and repair by the dealer and owner alike.)

There is this difference between the modern electric lighting and engine starting system and a watch, though both of them represent the result of highly specialized effort. The average person can sit down and in approximately half an hour take the lighting and starting system all to pieces, not counting the battery, of course, and in another half hour put it together again. There are mighty few persons who can take a watch to pieces and put it together again without having something left over; the watch would suffer by the proceeding. The lighting and starting system might suffer by the proceeding, and then, again, it might not suffer at all. At any rate, it has a better chance of surviving the ordeal without serious impairment of its efficiency than has the watch.

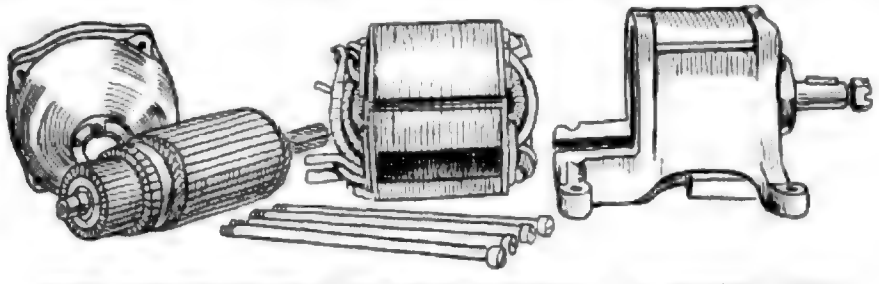
Adjusting the Circuit Breaker.

Happily, however, it is no more necessary to take the one apart than it is the other, though the distinction still remains that it requires a real expert to tinker with a watch, whereas the average amateur, aided by his brains, can tinker with his electric lighting and engine starting system without serious danger of crippling it. It is a rugged piece of mechanism as compared with the watch, though it may be just as delicately adjusted withal. But it has no tiny balance wheel and no hair-like springs, and though no man who values his timepiece will attempt to adjust it himself, for watches are not always adjusted by means of their regulators, it is no more difficult, as a rule, to adjust an electric lighting and engine starting system than it is to adjust a pair of suspenders. A screw driver may be needed, however, but a screwdriver is not a very complicated tool.

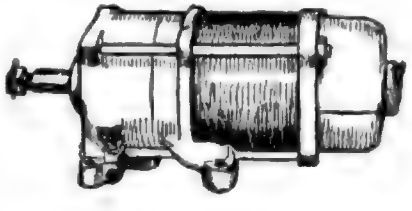
Probably the only part of the mechanism that ever will require adjustment, taking the word in its literal meaning which is to bring into such relations as will make for harmonious action, is the circuit breaker, that silent little watchdog of the battery and the dynamo which is eternally vigilant and which seldom takes a rest. Cases have been known, and in considerable number, too, where circuit breakers have lived out their useful life without any attention whatsoever. They have simply kept right on making the connection between the dynamo and the battery when the voltage of the former crept up and breaking it again when the voltage dropped despite neglect or wear or anything else. This, briefly, is the theory of such devices; they should operate indefinitely without giving cause for adjustment.

Most circuit breakers do operate for a year at least before they require cleaning and adjustment, and there are several reasons why this should be so. The first of them is that the mechanism is subjected to very little wear, for the good and sufficient reason that the circuit is made and broken only when the engine is started and stopped or when the speed is reduced 'way down below the legal limit, as when in heavy traffic. The second reason is that the latitude of movement of the parts is very limited and the parts themselves are designed with an ample factor of safety. Most manufacturers figure that it should not be necessary to touch their cut-outs for at least a year, and some of them are so sure of their ground that they strongly advise against making any alterations whatsoever; their instructions are, in the fewest possible number of words, "let it severely alone; if it shows signs of derangement send it back to the factory for adjustment."

The Jones Electric Starter Co., of Chicago, Ill., manufacturer of the Jesco electric lighting and starting system, is one of those which lays down the law pertaining to adjustments in no uncertain terms. The Jones company believes that after several years of experimenting and testing under very nearly every conceivable condition, it has evolved a system that will run almost indefinitely without any tinkering on the part of the owner. Hence, probably on the assumption (logical not so very long ago) that the average person, dealer or owner, is more likely to do damage than good in attempting to correct such slight troubles as are likely to occur with any system, the Jones company says, "let it alone," or words to that effect.



JESCO MOTOR-GENERATOR DISASSEMBLED SHOWING COMPONENT PARTS



MOTOR-GENERATOR ASSEMBLED

What to Do in Case of Trouble.

The manufacturer's wording is as follows: "Do not change any adjustments inside of controller without instructions to do so from the manufacturers." Obviously, it is the better part of wisdom to do as the manufacturer says—to write immediately the apparatus shows symptoms of laziness or inability to fulfill its mission in life and to be governed according to the reply. Then there is no chance of going wrong. But—and it is a very large but—conditions may arise, on the road, possibly far from human habitation, when adjustment of some sort is absolutely necessary in order to permit the car to be driven home. It is impossible to write or to wire to the manufacturer. Consequently, the owner must reply upon himself and no one else, at least temporarily. Ordinary common sense will help a whole lot, for as has been laid down in the twenty-one preceding articles on the same

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subject which have appeared in Motor World, the cut-out is at once the easiest part of the mechanism to take care of and to adjust, and the part which can cause the most serious derangement of the whole system when it gets out of order and its disease is not cured at once. Incidentally, the Jesco circuit breaker is no more difficult to adjust than is any other. However, it must be remembered that great care, and judgment, are required in adjusting any of them.

Putting Cut-out Back to Work.

If nothing else can be done, the better plan is to disconnect the wires which lead to the battery. Naturally, this will prevent the dynamo charging the battery, but it also will prevent the battery discharging itself through the dynamo, and if there is any "juice" left in the battery it then will be available to light the lamps or to start the engine. If the cut-out contacts have become stuck together because of the presence of dirt or through weakness of the spring that holds them apart, the remedy suggests itself. If the spring has become broken, it often is possible to improvise a spring or to utilize that portion of the old spring that remains. If the spring is merely weak, its tension can be increased slightly, though only very little should be taken up or the dynamo will not commence to charge the battery until the car speed is considerably more than is allowed by the laws. Dirty contacts can be cleaned very easily with a very thin and very fine file, or a file can be made by glueing a couple of piece of fine emery cloth to opposite sides of a piece of thin Bristol board. Where nothing else avails, and the wires to the battery cannot be gotten at to disconnect them, a small piece of thick paper inserted between the contacts will prevent the battery discharging itself through the dynamo when the engine is stopped.

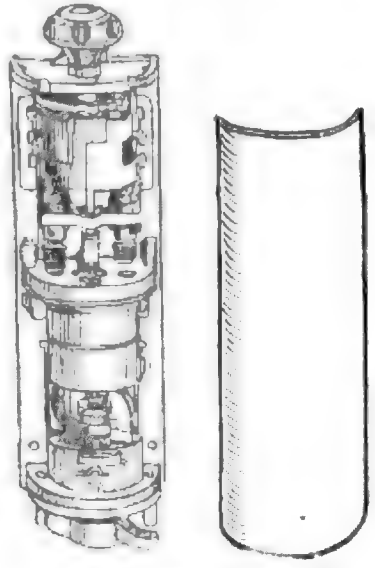
Combined Motor and Generator.

With a single exception, the whole Jesco system is very much like several other systems. Thus, for instance, the motor starter and the generator are combined in a single compact machine, thereby centralizing the apparatus and eliminating the necessity for separate drives to motor and dynamo. The single machine is connected to the gasolene motor through the intermediary of a "silent" chain running over a sprocket on the engine crankshaft. It operates as a motor when the current from the battery is turned on and immediately the gasolene engine takes up its own cycle of operations it automatically is converted into a generator and without more ado promptly takes up its business of placing back in the storage battery the current drawn out for lighting for starting the engine; the armature speed is unaltered.

The rate of charging current delivered by the generator is regulated within certain limits by the demand upon it, regulation being an inherent characteristic obtained in the method of winding; no outside relays or other mechanical devices are employed. But, so that the operator may have some say in the operation, so to speak, a manually controlled method of varying the charging rate is provided.

Adjustable Charging Rate Provided.

For instance, if the car is used a great deal at night and very little during the day, the charging rate can be increased to make up for the added drain on the battery caused



JESCO CONTROLLER UNIT

by continuous burning of the lamps. For normal conditions, when the car is used in the day and also at night, the charging rate can be made normal. If the car is used mostly during the day with very little night running and the engine is stopped and started comparatively little, a low charging rate will suffice and will be better for the battery. All of these different charging rates can be obtained quickly and easily by the operator without the necessity for him leaving his seat, with the aid of a tiny switch located beneath the controller; it may be seen quite clearly in the accompanying illustration. Moving the switch to the "high" side ensures a high charging rate, moving it to the left ensures a low charging rate, and if it is left in the center the rate will be normal for normal conditions.

This is one of the points of difference between the Jesco system and other systems. Another point of difference is in the arrangement of the starting switch and the light switches in a very small and compact "controller" which can be located almost anywhere on the car, though the preferable position is on the riser board between the front seat and the floor. In this position, it is right at the driver's hand and can be found, if need be, in the dark. The internal economy of the controller is shown by the accompanying illustration, which shows the arrangement of the switches.

Simple pressure downward brings two contacts together, thereby connecting the battery to the starting motor. Intermediate contacts are unnecessary, for the reason that the motor-generator always is permanently and directly connected to the gasolene engine. Rotating the knob until its pointer corresponds with indices on the top of the controller serves to make the necessary connections to light the various lamps in various combinations.

Operation of the Controller Unit.

The lighting switch is of the drum type, and as it provides sliding contact it is self-cleaning and there can be no reason for poor connections. Similarly, as there is only the one moving part—the central drum—there is nothing in it to get out of order and it cannot be adjusted for the reason that there is nothing to adjust. The starting switch consists merely of two pairs of buttons of large area which are brought together when the knob is depressed. There is nothing in this part of the apparatus, either, that can get out of order, though it will do more good than harm occasionally to clean the contacts. For the purpose, a small, fine, flat file is to be preferred and care must be taken not to remove any more of the metal than is necessary to bring the contacts back to their original state of brightness. A certain amount of sparking is bound to take place when the contacts are separated, due to the heavy current drawn by the starting motor, and as a result a certain amount of oxide will form. A small amount will have no appreciable deleterious result on the operation of the switch, but if it is allowed to accumulate poor contact will result and the starter may not evince its customary vigor. But it is a very simple matter to remove it, and the operation can be performed in not more than 10 minutes.

Construction of the Generator.

The construction of the motor-generator is slightly unorthodox, judging solely by other motor-generators, in that the field piece instead of being solid, is made of laminated sheet steel securely fastened together. This system ensures maximum power for weight. Similarly, the armature is constructed of laminated sheet steel and the windings are held in place by wedges much after the manner employed for very

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large and very heavy motors. The shaft is nickel steel carefully turned, tempered and ground true and the commutator is insulated with mica, no fiber or paper being used. The brush holders also are insulated with mica and the casing over the whole is formed of an aluminum alloy giving lightness and rigidity combined with water- and dirt-proof qualities.

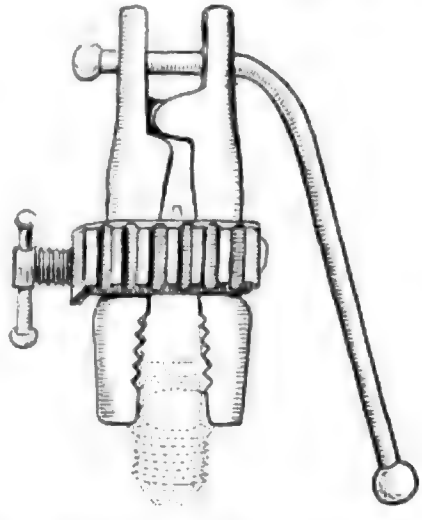
In the care of the motor-generator unit, there is very little that need be done or that can be done. The brushes and brush holding apparatus and the commutator are exposed by removing one of the end plates, the operation being accomplished by taking out a couple of screws. As the brushes are composed of a special compound calculated to run without attention for from 20,000 to 30,000 miles, it is manifest that they will not require to be touched. In fact, it is part of the specific instructions of the manufacturer that they be permitted to remain undisturbed. Similarly, the brushes are self-lubricating, which fact probably will be reflected in the condition of the commutator after long service. After a season's use, it ought to be smooth and appear glossy and brownish, and if it does it should not be touched under any considerations. If, however, it appears dull and dirty and is slightly scratched, the sandpaper cure must be applied. Use No. 00 sandpaper and apply it lightly and for a time long enough to remove all the dirt and scratches. A heavy application is likely to do more harm than good.

In taking very nearly all the care required out of the owner's hands, Jesco engineers have not overlooked the lubrication problem, and inasmuch as lack of lubrication or too much oil or oil where there ought not to be any at all are three of the causes which contribute a great part of all the troubles that starting and lighting apparatus can give, the achievement of an automatic system ought to go a long way toward conducing to peace of mind. The armature is carried in imported annual ball bearings and consequently it requires very little oil. What little is required is supplied from a compartment in the case which holds sufficient oil for long periods. Incidentally, oil from the same compartment lubricates the drive chain. Hence, all that is required is to refill the reservoir from time to time, putting in as much fine, light oil as the compartment will hold. To take up the slack in the driving chain, an adjustment is provided.

Another distinctive feature of the Jesco system which should go a long way toward simplifying installation or subsequent overhauling or adjusting, is the use of wiring of different colors for different purposes. The wires that lead from the switch to the head lamps, for instance, are yellow and white, respectively; the wires that lead from the switch to the battery are black, blue, green and yellow, the battery being split into two units for convenience in charging and in distributing the lighting load. Other wires are of other colors, making it practically impossible for any one other than a color blind person to get the wires crossed and connected up wrongly.

Tool that Replaces Socket Wrenches.

One of those handy little tools that can be used for half a dozen different purposes has been brought out by the Raymond C. Agner Co., of Burlington, Wis., under the style Simplex wrench. One of the advantages of the device is its simplicity, which is so clearly shown in the accompanying illustration that extended description is



quite unnecessary. The tool takes the place of a set of socket wrenches, for many jobs, being adjustable to any size nut from 6/15 inch to 1¼ inches. It will handle any spark plug and can be used to hold the plug if, for instance, the plug has been removed while hot. In fact, it is an effective little hand vise. It works equally well with square or hexagon nuts, and may be used as a tap-wrench. The jaws are set to the right size by means of the screw, which also serves to clamp the jaws in position when the tool is used as a hand vise.

Conditions That Affect Cutting Edges.

The secret of a good cutting edge, whether it is on a cold chisel or a razor, lies in the correct angle and the proper hardness of the steel. Because a tool that is too soft will not take or hold a good cutting edge it does not follow that the harder the steel is made the better it will work. If the steel is excessively hard it will be brittle, and the thin edge will easily break away, leaving a rough, dull edge. If too soft the edge will bend over. Because a razor does not have to be forced hard, it can be made harder than an instrument that requires more weight to send it through the material it is designed to cut, and the edge can be thinned down. To go to the opposite extreme, a cold chisel, which is driven through metal by blows of a hammer, must be considerably tempered or softened and its edge ground to an angle that is very obtuse as compared with that of a razor. Almost any tool can be made too sharp—that is, so sharp that when put to its work the edge will either break off or turn over, according to the hardness of the steel.

Best Remedy for "Pocketed" Valves.

Continual grinding of the valves will in time cause the seats to be "pocketed"—that is, the seat will have worn away so that it is very much lower than it originally was, whereby the passing gases are throttled to a considerable degree. There are several ways of remedying matters. The simplest is to cut away the side walls of the pocket formed to allow of the free passage of the gases. Another method embraces threading the side walls and fitting a bushing in which a new valve seat is formed. The best method, however, is to cut a new seat in the side walls, which naturally will be of larger diameter than the original valve seat. Valves to accommodate the new seat then are fitted.

Alcohol as a Moisture Eradicator.

Although the greatest care should always be taken to keep moisture from the magneto, and in fact from each and every part that has to do with the ignition of the charge, when luck is "agin one" and water does creep in and prevent proper functioning, it should be remembered that alcohol has a great affinity for water, and because of this affinity it can be used to advantage to eliminate the very last traces of moisture. The magneto, or the wetted cables, as the case may be, should be immersed in the alcohol for a few moments and then fanned until the liquid has evaporated, and, evaporating, taken the moisture with it.

How Winter Starting May be Aided.

Stopping the motor by closing the air inlet to the carburetter results in the introduction of a very rich mixture into the cylinders and considerably facilitates matters when the time for starting arrives. The practice is to be recommended where a motor is difficult to start during cold weather.

Evolving an Emergency Screwdriver.

In a pinch, a right angle screwdriver can be very easily "rigged up" by placing a washer between two nuts on a bolt and locking it in place with one of the nuts. The protruding washer then is filed flat, so that it will not jump out of the slot in the head of the screw.

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1,026,287. Lubricating System for Explosion-Engines. Cecil Hamelin Taylor and Howard E. Coffin, Detroit, Mich. Filed June 27, 1910. Serial No. 569,205. (Means for lubricating a rotary valve motor.) 9 claims.

1,026,314. Starting Device for Explosive-Engines. William C. Hartmann, Milwaukee, Wis., assignor to Milwaukee Separator Co., Milwaukee, Wis., a corporation. Filed Jan. 13, 1911. Serial No. 602,435. (Clutch mechanism for starting handle.) 3 claims.

1,026,358. Detachable Limousine-Top for Automobiles. Oscar N. McCallister, Mount Vernon, Ind. Filed June 20, 1911. Serial No. 634,331. (Top designed to fold into spaces in the body.) 2 claims.

1,026,368. Vehicle-Top. Alexander Ritchie, Detroit, Mich. Filed March 13, 1911. Serial No. 614,116.) (Frame comprises a single bow and suitable levers.) 3 claims.

1,026,370. Vehicle-Wheel. Herbert J. Sewell, Detroit, Mich. Filed May 4, 1911. Serial No. 625,012. (Solid rubber tire mounted on resilient wheel felloe.) 3 claims.

1,026,374. Starting Device for Explosive-Engines. Ernest V. Swern, Denver, Colo., assignor of one-fourth to John H. East, Denver, Colo. Filed March 1, 1911. Serial No. 611,681. (Starting pedal belted to crankshaft.) 12 claims.

1,026,375. Driving-Gear for Vehicles. Judson R. Tibbles, Macedonia, Iowa. Filed Sept. 25, 1911. Serial No. 651,135. (Means for transmitting power to steering wheels.) 10 claims.

1,026,408. Wind-Shield. Frederick Schimper, Union, N. J., assignor of one-half to Alfred H. Koeller, Ridgefield Park, N. J. Filed Jan. 24, 1912. Serial No. 673,020. (Zig-zag type of windshield.) 2 claims.

1,026,424. Engine. Theodore J. Ashby, Perryville, Ark., assignor of one-fourth to J. E. Bell, Gordon, Ga. Field Oct. 5, 1911. Serial No. 653,080. (Atomizing nozzle leads directly into cylinder of two-cycle motor.) 4 claims.

1,026,462. Transmission Mechanism. Lewis E. Schlotterback, East Orange, N. J., assignor to L. E. Schlotterback Mfg. Co., a corporation of New Jersey. Filed Aug. 4, 1911. Serial No. 642,222. (Combined gearset and clutch.) 13 claims.

1,026,491. Carburetter. William Hull Browning, Rye, N. Y. Filed Nov. 2, 1910. Serial No. 590,328. (Fuel drips from needle valve onto inverted gauze cone.) 8 claims.

1,026,496. Vehicle-Spring. Arthur Collette, Brockton, Mass. Filed Dec. 18, 1911. Serial No. 666,401. (Helical spring attaching to component parts through a bell crank lever.) 4 claims.

1,026,504. Steering-Head for Vehicles. George Francis Garrity, Scranton, Pa. Filed Feb. 6, 1911. Serial No. 606,993. (Flexible grip for steering wheels.) 4 claims.

1,026,528. Starting-Crank for Hydrocarbon-Engines. Elias J. Patton, Michigan City, Ind., assignor of one-half to Jay P. Bergeron, Michigan City, Ind. Filed May 1, 1911. Serial No. 624,337. (Composite handle designed to be released in case the engine kicks back.) 9 claims.

1,026,534. Auto Cranking Device. Fletcher H. Waddill and Roy D. Fonda, Dexter, N. Mex. Filed June 28, 1911. Serial No. 635,725. (Pedal connected to crankshaft through levers and bevel gears.) 1 claim.

1,026,563. Internal-Combustion Engine. David H. Coles, Brooklyn, N. Y., assignor by mesne assignments to Requa Motor Co., a corporation of New York. Filed Oct. 16, 1909. Serial No. 523,044. Renewed April 1, 1912. Serial No. 687,773. (Two cycle motor with double diameter piston.) 9 claims.

1,027,409. Vehicle Wheel. John A. Etzold, Detroit, Mich. Filed Apr. 26, 1910. Serial No. 557,772. (Spokes in the form of strip springs). 2 claims.

1,027,434. Vehicle Wheel. Abraham Grove Reaman, Ringwood, Ontario, Canada. Filed Sept. 12, 1911. Serial No. 648,825. (Spokes formed of telescoping tubes with enclosed helical springs.) 1 claim.

1,027,447. Suspension Frame for Transmission Gear. Ernest M. Sternberg, Milwaukee, Wis. Filed Dec. 17, 1910. Serial No. 597,895. (Means for supporting gearset and connecting elements.) 3 claims.

1,027,450. Anti Skid Device. Langdon S. Thompson, Jersey City, N. J. Filed Jan. 2, 1912. Serial No. 668,902. (Chain made of wire links.) 9 claims.

1,027,469. Muffler. Samuel W. Forney, Pulaski, Va. Filed Aug. 29, 1911. Serial No. 646,576. (Flanged end causes introduction of air which cools the gases.) 2 claims.

1,027,507. Vehicle Wheel. August Ferdinand Schulz, Milwaukee, Wis. Filed Mar 17, 1911. Serial No. 614,982. (Strip steel springs between wheel rim and tread.) 1 claim.

1,027,508. Locking Cap for Tire Valves and the Like. Maximilian Charles Schweinert, West Hoboken, N. J., and Henry P. Kraft, New York, N. Y. Filed Jan. 22, 1907. Serial No. 353,544. (Notched disk engages with a spring and prevents turning.) 12 claims.

1,027,541. Anti-Friction Bearing. Henry Hess, Wawa, Pa., assignor to The Hess-Bright Manufacturing Company, Philadelphia, Pa., a Corporation of Delaware. Filed Sept. 24, 1909. Serial No. 519,315. (Added raceway for the temporary reception of the balls.) 5 claims.

1,027,550. Inductor Magneto. Robert C. Lanphier, Springfield, Ill., assignor to Sangamo Electric Company, Springfield, Ill., a Corporation of Illinois. Filed Oct. 9, 1909. Serial No. 521,947. (Inductor type of magneto.) 8 claims.

1,027,647. Vehicle Wheel. Lucien R. Gruss, Chico, Cal., assignor to Auto-Compressed Air Wheel Company, Chico, Cal., a Corporation of California. Filed Aug. 8, 1910. Serial No. 576,231. (Helical springs enclosed in telescoping tubes which form the spokes.) 34 claims.

1,027,648. Engine Starter. Edwin Guthrie, Washington, D. C. Filed Mar. 1, 1912. Serial No. 680,913. (Cooling fan provided with buckets so as to form an impulse wheel against which water is directed under pressure to turn the crankshaft.) 3 claims.

1,027,649. Gas Engine Starting Device. William A. Hansen, San Francisco, Cal. Filed Dec. 13, 1910. Serial No. 597,025. (Auxiliary vaporizer provides mixture for the cylinders.) 11 claims.

1,027,680. Internal Combustion Engine. Mastin L. Williams, South Bend, Ind. Filed Dec. 20, 1909. Serial No. 534,154. (Two-cycle motor with double diameter pistons.) 8 claims.

1,027,730. Motor Vehicle. Claud Hoadley, Gosport, Ind. Filed Feb. 11, 1911. Serial No. 607,924. (Means for transmitting power to all four wheels.) 8 claims.

1,027,733. Tire. Newton H. Horne, Kansas City, Mo. Filed July 19, 1911. Serial No. 639,385. (Tire made up of flat steel strips superimposed upon each other.) 1 claim.

1,027,736. Power Transmitting Mechanism for Motor Vehicles. Frank A. Kirby, Detroit, Mich., assignor to Kirby Motorcar Company, Detroit, Mich., a Corporation of Michigan. Filed Dec. 13, 1910. Serial No. 597,044. (Modified friction drive.) 7 claims.

1,027,737. Lamp and Reflectors for Same. Charles Henry Kruger, Bradford and Clifford Whiteley Collinson, Baildon, England. Filed May 16, 1911. Serial No. 627,443. (Rays reflected by suitable mirrors.) 4 claims.

1,027,768. Carburetter. William E. Roby, Indianapolis, Ind. Filed Apr. 28, 1911. Serial No. 623,896. (Diaphragm operated by the suction of the motor controls the fuel.) 7 claims.

1,027,798. Safety Cranking Device for Explosive Engines. John L. Beck, Springfield, Mass., assignor to The Auto Safety Crank Company, Holyoke, Mass., a Corporation of Massachusetts. Filed Feb. 24, 1911. Serial No. 610,483. (Clutch for connecting the handle to the shaft.) 10 claims.

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Stock Champion International Champion

National 40

The Last Analysis—What Owners Say

"I have given my National car very severe tests and have found it absolutely satisfactory in every respect."

"I am free to say that I never had a car that gave me more real satisfaction than my National car has."

"This is the fourth car I have owned, but the National is the first car with which I have known the real pleasures of motoring."

"The National is as represented and has given me the best of satisfaction."

"It is a car of exceptional riding qualities. The National car is the one for those whose recreation is touring."

"The factory service is all that could be asked."

"If at any future time I purchase another car, it will be another National."

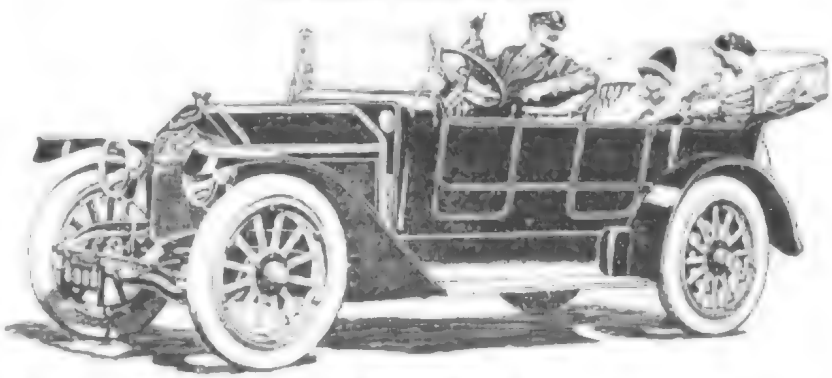
"I do not think that it is possible for me to buy anywhere in the United States, at any figure, any car that would give me any better satisfaction than I am getting from my National car."

"The car is satisfactory in every respect. Extreme flexibility and ample power make it a pleasure to drive this car; and after twelve years' experience in driving I appreciate the quality as well as the quantity of performance this car is capable of giving."

"My National 40 touring car is giving excellent satisfaction and seems to me to be all that could be desired in a first-class dependable machine."

Names furnished on request. Write for book—letters from National owners.

Five Models, $2750 to $3400



National Motor Vehicle Co., Indianapolis, Ind.

NEW DEPARTURE BALL BEARINGS



Standard on 80% of 1913 Cars.

American Made for American Trade

The increasing use of ball bearings in motor cars is easily explained.

Manufacturers are not now required to buy ball bearings abroad. The New Departure has proved satisfactory in service, possesses all of the quality essentials and in every respect is an American masterpiece.

It is more completely anti-friction than any other type—the cost to operate the car mounted on these bearings is consequently less.

It is ten times as efficient as a roller bearing under same load conditions.

At the Boston Show, Space No. 430, Balcony, each of the three types of New Departure ball bearings will be shown, in slow action, with sections cut away for demonstrating anti-friction and other qualities.

Ask for copy of "Friction and Its Elimination"—a treatise on comparative efficiency of all types of bearings—just from the press.

THE NEW DEPARTURE MANUFACTURING COMPANY
BRISTOL, CONNECTICUT
Western Branch: 1016-17 Ford Building, Detroit

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"Radax"

Automobile Manufacturers Who Use



Storage Batteries

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For Starting or Lighting or Both

Abbott Motor Co.....Detroit, Mich
American La France Fire Engine Co.....Elmira, N. Y.
American Locomotive Co.....Providence, R. I.
American Motors Co.....Indianapolis, Ind.
Ames Motor Car Co.....Owensboro, Ky.
Apperson Bros. Automobile Co.....Kokomo, Ind.
O. Armleder Co.....Cincinnati, Ohio
Auburn Automobile Co.....Auburn, Ind.
Bartholomew Co.....Peoria, Ill.
Buckeye Mfg. Co.....Anderson, Ind.
Canadian Standard Auto & Tract. Co.....Ft. Wayne, Ind.
Cartercar Co.....Pontiac, Mich.
J. I. Case T. M. Co. Motor Works.....Racine Jct., Wis.
Chadwick Engineering Works.....Pottstown, Pa.
F. Coleman Carriage & Harness Co.....Ilion, N. Y.
Columbus Buggy Co.....Columbus, Ohio
Commerce Motor Truck Co.....Detroit, Mich.
Corbitt Automobile Co.....Henderson, N. C.
Crawford Automobile Co.....Hagerstown, Md.
Crescent Motor Co.....Cincinnati, Ohio
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Great Western Automobile Co.....Peru, Ind.
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Havers Motor Car Co.....Port Huron, Mich.
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King Motor Car Co.....Detroit, Mich.
Kline Motor Car Co.....Richmond, Va.
Knox Automobile Co.....Springfield, Mass.
Lenox Motor Car Co.....Boston, Mass.
Lexington Motor Car Co.....Connersville, Ind.
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Lozier Motor Car Co.....Detroit, Mich.
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National Motor Vehicle Co.....Indianapolis, Ind.
Nordyke & Marmon Co.....Indianapolis, Ind.
Norwalk Motor Car Co.....Martinsburg, W. Va.
Nova Scotia Carriage Co.....Kentville, N. S.
Paige-Detroit Motor Car Co.....Detroit, Mich.
Paterson Wagon Works.....Flint, Mich.
Peerless Motor Car Co.....Cleveland, Ohio
Pilot Motor Car Co.....Richmond, Ind.
Pope Mfg. Co.....Hartford, Conn.
Premier Motor Car Co.....Indianapolis, Ind.
Pullman Motor Car Co.....York, Pa.
Regal Motor Car Co.....Detroit, Mich.
Reo Motor Car Co.....Lansing, Mich.
Reo Motor Car Co. of Canada.....St. Catharines, Ont.
Russell Motor Car Co.....W. Toronto, Ont.
Schacht Motor Car Co.....Cincinnati, Ohio
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Selden Motor Car Co.....Rochester, N. Y.
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A. O. Smith Co.....Milwaukee, Wis.
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Stoddard-Dayton Co. (Maxwell).....Dayton, Ohio
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Touraine Motor Car Co.....Philadelphia, Pa.
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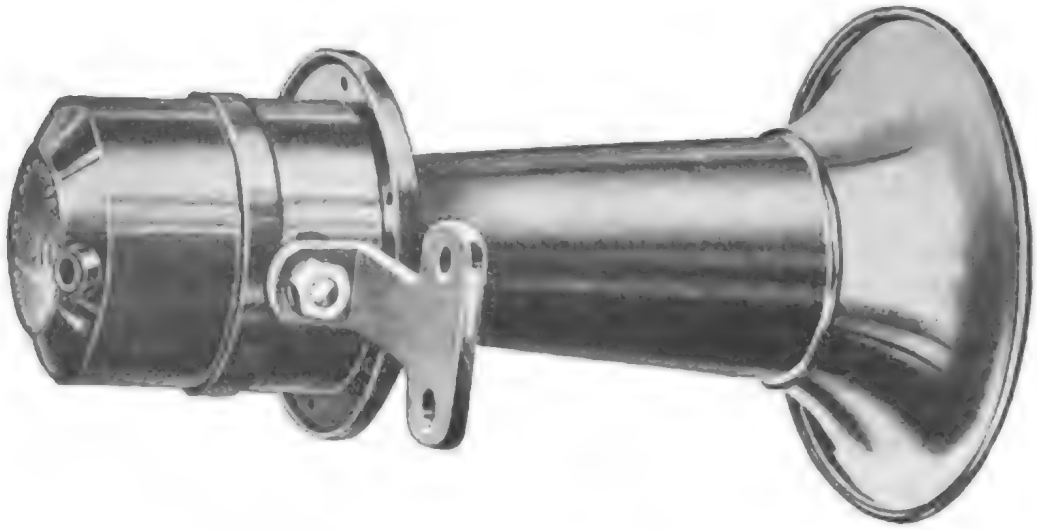
Willard Storage Battery Co.

Cleveland, Ohio

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Elyria-Dean
TRADE MARK

REXO HORN



The Rexo Always Acts When Needed

The Rexo single-tone horn protects your own safety and that of other people because it always works—it never refuses to act just when it is most needed.

It gives out a strong warning note **every time** the button on the wheel is pressed, and commands **immediate** attention from pedestrians and drivers of other cars.

The Rexo horn is reliable because it is simple and free from complications. It has no parts to get out of order—it is substantial and well-built to stand the jarring and vibration of the car's motion—and it is finished so that the weather has no effect on its appearance or its operation.

Because the Rexo is so reliable and so trouble-proof we guarantee it for life.

The Rexo costs little for upkeep, as it operates with a small amount of current and can be connected to any 6-volt battery, an advantage in both cost and space saving.

This splendid horn takes none of your time or money for frequent overhauling or attention to lubrication or repairs. A slight adjustment once a year, made with a screw driver, is sufficient to overcome a season's wear.

The popularity of the Rexo is shown by the fact that more than 75,000 of these horns were sold for use on 1913 cars as **regular equipment.** Enormous sales to owners of cars make this the most widely used, low-priced horn made.

In addition to the Rexo, which sells for $8, complete, we make the Tuto, a high grade two-tone horn for $25, and the Tutoette, a smaller two-tone horn for $17.50.

Elyria-Dean Products Manufactured Only By

THE DEAN ELECTRIC COMPANY

Kansas City **501 Olive St., Elyria, Ohio, U. S. A.** **San Francisco**

"Look for Elyria-Dean Where Quality's Seen"

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Elyria-Dean
TRADE MARK

TUTO HORN



The TUTO—The Horn for Careful Drivers

The careful driver who guards the safety not only of himself and the occupants of his car, but the safety of pedestrians and those in other cars as well, knows he must use a quickly responsive, attention-getting signal of warning.

The Tuto two-tone horn is the best safeguard that can be put on any automobile.

It is a complete signaling system. It electrically transmits two different and distinct sounds through a horn—one low and mild for ordinary usage, the other loud and penetrating for critical situations and emergencies. The degree of sound is regulated by the degree of pressure given the button located upon the steering wheel.

The Tuto is very reliable and absolute confidence can be placed on its perfect operation at all times It is free from trouble-making parts and requires no care or attention except perhaps a slight adjustment once a year to overcome the season's wear.

It operates by any 6-volt battery and costs little to maintain, as the low tone, which uses little current, is sufficient for most of the signaling done.

The Tuto horn is substantially and carefully built of the highest grade material and lasts for many years. Its satisfactory service and long life are insured by a liberal guarantee, in fact, a guarantee for "Life."

Finished in polished brass or nickel, plain black enamel, and black enamel with brass or nickel. Price, $25.00, complete with button and cord.

We also make the Rexo, a single-tone horn for $8, and the Tutoette, a small two-tone horn for $17.50.

Elyria-Dean Products Manufactured Only By

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AN OPEN LETTER FROM

MAXWELL MOTOR COMPANY

INCORPORATED

DETROIT, MICHIGAN

March 8, 1913

Gentlemen:-

There seems to be a lot of misunderstanding with regard to the manufacturing and sales policy of the new Maxwell Motor Company

This misunderstanding is largely due, doubtless, to a lot of misinformation that has been diligently circulated by competitors.

Their reasons for desiring to impede the progress of the reorganized company are apparent--they do not welcome such competition as we purpose giving them.

So their attitude is natural--and we don't mind.

We might have stopped a lot of the talk some time ago had we considered it worth while to tell our story. But we didn't.

It was not our time to talk--it was ours to work--to plan --to produce.

According to my idea, the time for the manufacturer to talk is when he is ready to deliver the goods. In times past we might have saved our office force a lot of work had we observed that rule. This time we have done so.

I think I know what you want.

I think you know we can produce that kind of a line.

That being the case, we have just gone ahead sawing wood --disposing of such plants and equipment as we could not use to advantage, and re-arranging and re-equipping the others preparatory to building cars in quantities.

Meantime, our engineers have been busy. They have had before them every car with which they will have to compete. Their task was to beat them all.

A big task, you'll say: Yes, but that's the kind of men who comprise this organization.

I figured--and I think the future will bear me out-- that our best plan was to keep quiet while the other fellow talked himself out.

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MR. FLANDERS TO DEALERS

He has shot his bolt. He has said all he can say--and now is ashamed of most of it. He's apologizing now--so we'll leave him in that position.

Meantime, we've followed Teddy's precept, "Step softly but carry a big stick."

Talk on our part would have accomplished nothing. We had no apologies to make--no goods to deliver--so why waste time talking.

What you as a dealer are interested in is a line of cars that will compete-- that will sell easier, and to which you can tie for permanency and profit.

Am I right?--all right. We have that line. And, our sales policy will suit you too well to suit our competitors!

I have always maintained that marketing the product is the big problem in business. Manufacturing is a problem in acreage--in capital, in machines, and men.

Most of my business life has been spent in selling. I think I know your problems.

And we need you to make this business a success.

We are going to need a lot of good dealers to sell the quantities of automobiles we are going to make. And we are going to need you more and more as the years go by--as competition gets keener and as manufacturing margins get smaller.

How are we going to get you-and keep you? That is our problem.

I think I know--I think I have worked it out so it will mean more to you to come with us, and more to you to stay with us than to go elsewhere or handle any other line.

Are you interested? Then read the series of open letters we will publish from week to week in this space. In those letters I will treat frankly and fully with every phase of the subject. Frankly and fully.

It's our time to talk now--for we have the goods and are about ready to deliver.

Yours very truly,

MAXWELL MOTOR COMPANY (Inc)

Walter E. Flanders.

President and General Manager.

Warner
AUTO-METER
(MAGNETIC PRINCIPLE)

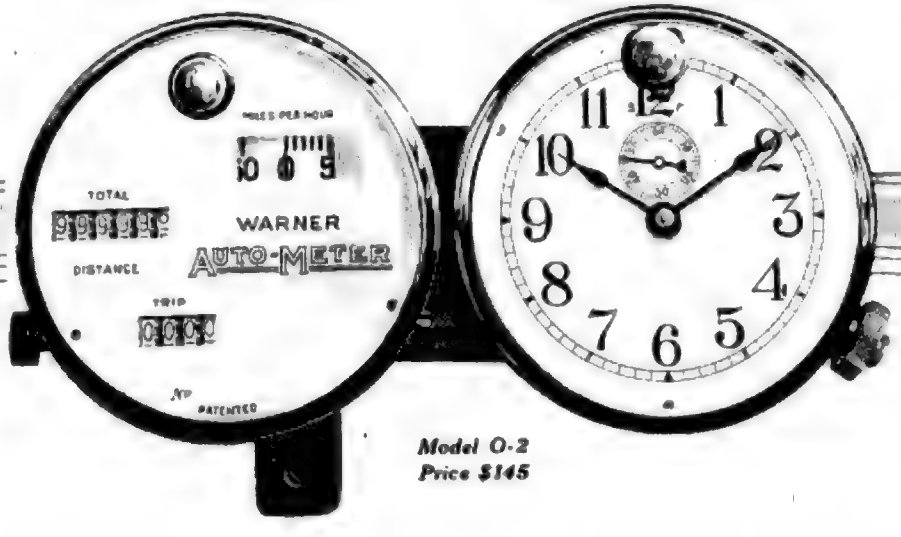
THE Warner Auto-Meter has been successful in exact proportion to its accuracy as a speed and mileage indicator.

Being built on the only scientifically correct principle (magnetic) it has rendered such unfailingly accurate service, for so many years, that now over 98 per cent of all the high priced cars to be manufactured for 1913 will carry it as standard equipment.

Please Address Dept. 4

Warner Auto-Meter Factory, Beloit, Wisconsin

Branches in all principal cities all over the world



Model O-2
Price $145

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"It Hangs Everywhere"



The DIRECTORY

Goes to Press March 20th

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The AUTOMOBILE TRADE DIRECTORY'S

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Our advertisers have an absolutely complete list, embracing every Garage, Salesroom, Repair Shop, Charging Station and Supply House in the United States, Canada and Mexico; also every Automobile, Commercial Vehicle and Motor Manufacturer together with the names of their Purchasing Agents, Mechanical Engineers, Superintendents and other officials..

This list, the only complete and thoroughly corrected one of its kind in existence is a most valuable adjunct to the sales and advertising departments of any manufacturing concern in the automobile industry.

***The* AUTOMOBILE TRADE DIRECTORY,** 243-49 WEST THIRTY-NINTH STREET NEW YORK

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WESTINGHOUSE ELECTRIC

IGNITION LIGHTING AND STARTING

These Systems
Will Be Found on
Many of the Finest Cars
The Systems Using a Single Wire With a Ground Return



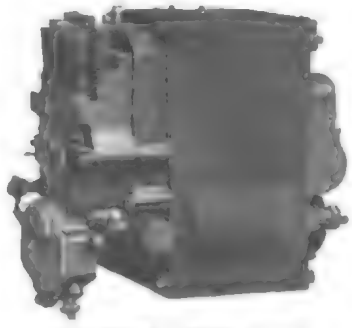
Lighting Generator



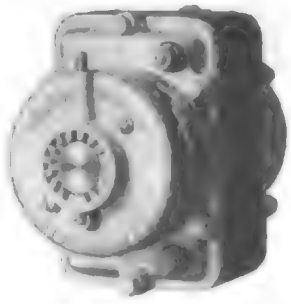
Ignition Coil and Switch



Illuminated Dial Voltmeter



Combined Ignition and Lighting Generator



Starting Motor

Lighting—Westinghouse Lighting Generators automatically charge the battery without the use of any relays, or solenoid-operated regulators. There are no adjustments to be made. The battery is at no time charged at an excessive rate. The generator is slow speed, eliminating noise and wear.

Ignition—A high power, single-unit coil, acting in conjunction with timing and distributing parts on the generator, furnishes high voltage for the spark. The battery operating alone, or with the generator, supplies continuous power. The interrupter gives automatic spark advance. The spark is uniform, regardless of speed.

Starting—Minimum weight of motor, and minimum discharge of the battery are features of the Westinghouse Starting Motors, permitting the use of a smaller battery and smaller charging generator.

Illuminated Dial Meters—Three inches in diameter, with black dials and white lettering to avoid glare. The lamp throws light on the dial only, no direct rays being visible. Ammeters or voltmeters supplied, but voltmeters used for standard equipments.

The Westinghouse Company has adopted the grounded system of car wiring, **using a single wire with a ground return.** The wiring is simplified; one-half the usual amount of wire is required; better insulation is secured; proper current carrying area is possible; installation cost is lowered; and troubles are reduced to a minimum. Complete parts are supplied for this grounded wiring, including lamp connectors and incandescent lamps with the Center Contact.

Electrical equipment that is the product of the Westinghouse Company, and backed by its long established reputation, warrants the consideration of every motor car manufacturer.

Westinghouse systems are proving the strongest talking points on high-grade 1913 cars.

Westinghouse Electric & Manufacturing Co.

EAST PITTSBURGH, PA.

Springfield Metal Bodies

It is no longer the question—metal or wooden body, but simply, "What is the best metal body with which to equip?"

Springfield Metal Bodies are made by the originators of the metal body. This concern first grasped the utility and desirability of metal over wood. Today, after twelve years in the business, we hold the balance of high grade trade in aluminum and steel bodies, covering all types of pleasure cars.

Springfield Metal Bodies are standard on the majority of America's leading cars for the very good reason that they embody all the quality made possible by years of experience in the art of aluminum and steel body construction. This illustration shows one of the many body designs turned out by our factory.

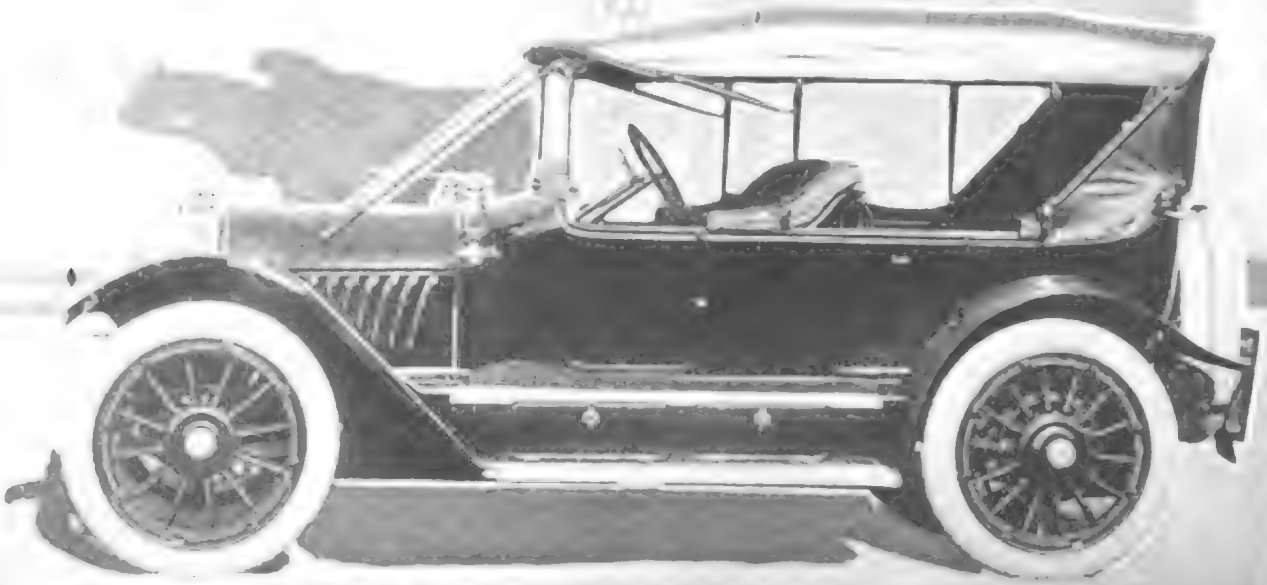


Springfield Convertible Bodies

The Springfield Convertible Body, a later development, gives the owner a complete glass enclosed body in less time than an ordinary top can be raised and curtains adjusted. It is a subject for your investigation, if you are a dealer who insists on quality equipment.

Springfield Metal Body Co.

Springfield, Mass.



Regal

Advantages of the Underslung

The Seven Regal Reasons

FIRST—An Underslung is the safest car. Its construction—the frame below the axle—brings the weight of the car nearer the road, yet allows full and even clearance. "Turning turtle" becomes an impossibility—skidding a rarity.

Second—Each Underslung has a "different" appearance. All the Regal Underslungs are attractive cars to look upon. Their design embodies graceful lines, a low rakish appearance that is pleasing to the eye and the utmost in correct proportion. Every owner is proud of the car he drives. Dealers are frequently led to a sale through the appearance of the car.

Third—Their spring construction makes Regal Underslungs easy riding cars. The separate "halves" of each spring vibrate at different rates—overcoming the violent bounce. The flatness of each spring adds to its lateral strength and relieves the side sway.

Fourth—Regal Underslungs are economical on tires and in gasoline consumption. The rebound of all springs is upward, thus relieving the strain on tire casings. Low suspension means a straight line drive, and power developed in the motor is not wasted in the universal joints. Regal cars average between fifteen and twenty miles to the gallon of gasoline.

Fifth—The Underslung principle is a tried-out principle. It has been used for years on rapid moving conveyances and is now far beyond the experimental stage in the manufacture of automobiles. Eight successful firms are now engaged in the building of Underslung cars.

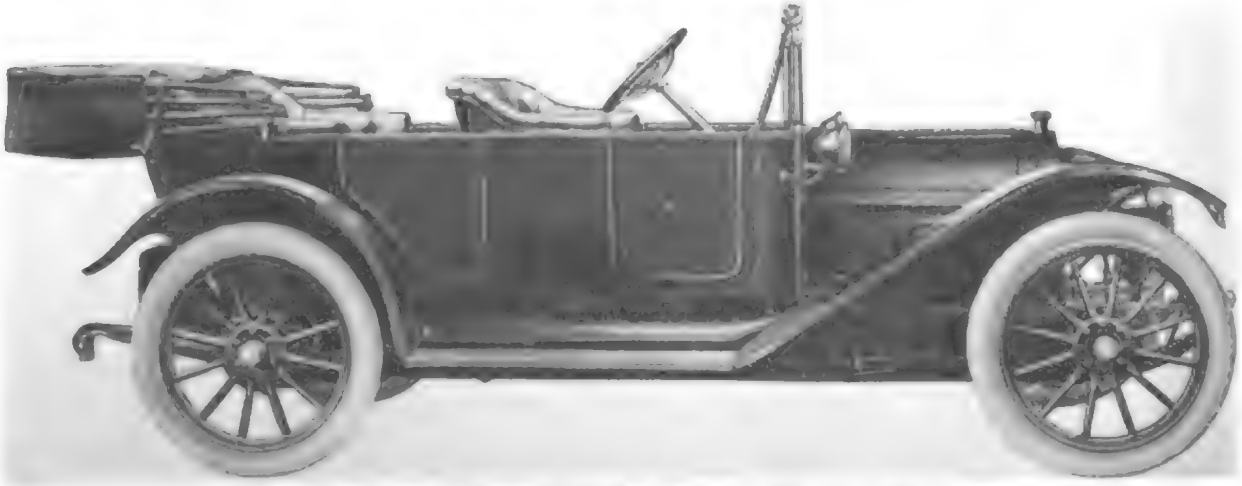
Sixth—We know how to design, build and finish Underslungs. In the field of the moderate priced car of this type we were pioneers and are today the largest manufacturers of this kind of car.

Seventh—Regal Underslungs are unusually good cars. Their dependable construction and conservative price makes them worthy your careful consideration. If intending the purchase of a car we ask you to learn more about the Underslung construction and Regal cars. Write us at the factory.

At the service of those who care to use them are special correspondents in our organization who will be pleased to answer further questions about Underslung construction. These Regal Reasons are only seven of several which we shall be pleased to give you. Address the Sales Department. Ask for Catalogue B.

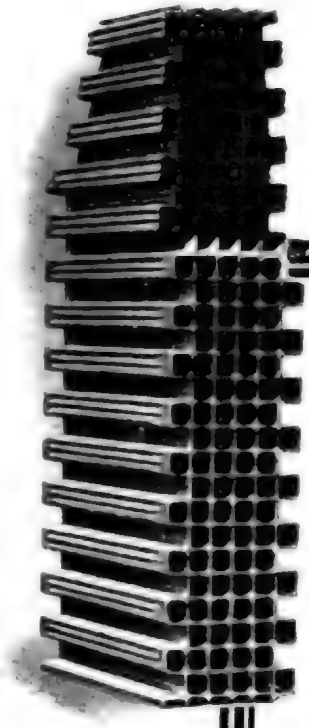
The Regal Motor Car Company, Detroit

One of the Regal Underslungs



$950—The Regal Model "T" Underslung Touring Car—$950

Livingston Radiator



Don't make water carriers out of your customers this summer

You, Mr. Dealer, and you, Mr. Manufacturer, are the men who ultimately must suffer the losses of both good will and patronage due to inefficient radiators. It's you who will be soundly berated when the water in the inefficient radiator boils away to such an extent that your motor power falls off perceptibly.

And you should be blamed—both of you—for Livingston Radiators will solve every single radiator problem—and Livingston Radiators will show a lower net cost to the car maker than any other radiator made. If you don't believe this write us—we'll prove it.

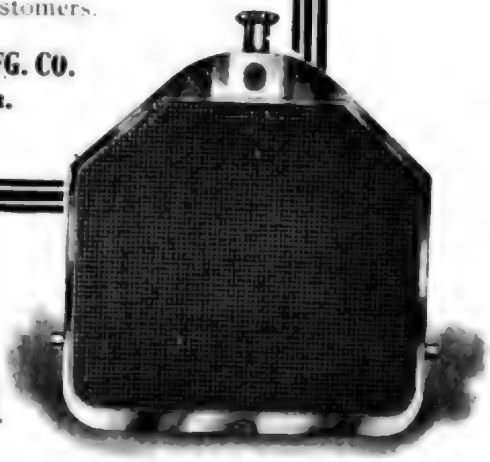
You, Mr. Dealer, must protect your customers

You, first, must bear the brunt of poor car service. Protect your reputation and your pocketbook by insisting on Livingston Radiators on the cars you sell. They mean more car life and more car comfort to your customers.

LIVINGSTON RADIATOR & MFG. CO.
Randall Building, 52d St.
New York

We Build Radiators for Individual Car — Owners

All Types of Radiators Built Rebuilt & Repaired

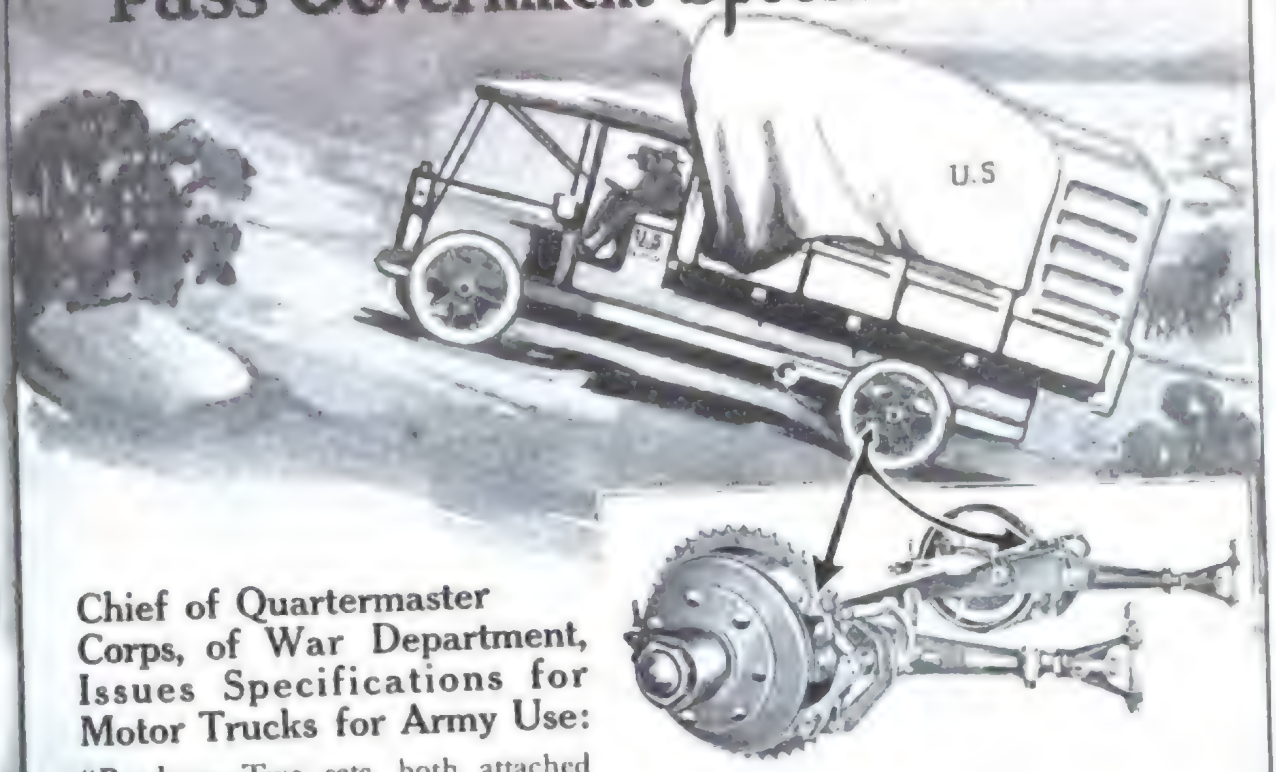


U.S. Army Takes No Chances With Jackshaft Brakes

SHELDON

Double Brakes On Rear Wheels

Pass Government Specifications



Chief of Quartermaster Corps, of War Department, Issues Specifications for Motor Trucks for Army Use:

"Brakes—Two sets, both attached to rear wheels; one set operated by pedal, other by lever."

¶ **Sheldon Double Brakes on Rear Wheels** meet the Government specifications.

¶ **Equip Your Trucks With Sheldon Double Brakes** and bid on the **Army Trucks.**

¶ **Army Takes No Chances With Jackshaft Brakes,** by demanding that all **Army Trucks** be equipped with both brakes on rear wheels.

¶ **Jackshaft Brakes** are no stronger than the chains. Could you skid the wheels and stop your truck if the chains broke or jumped off the sprockets??????

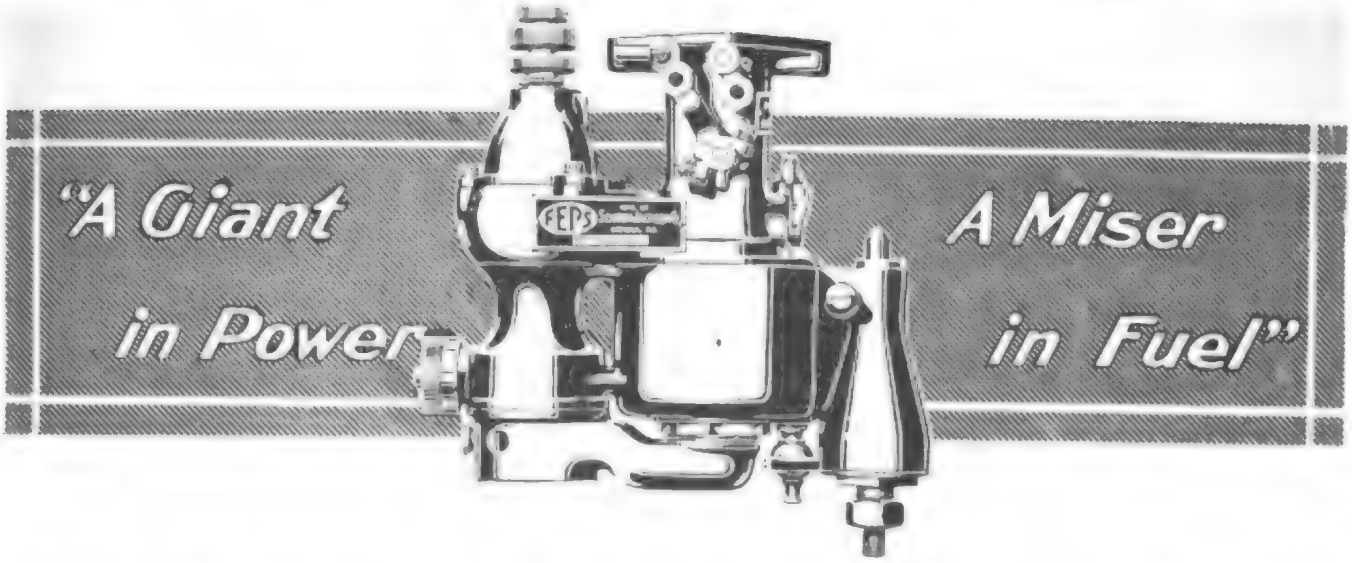
¶ **You Can Not Depend** on jackshaft brakes skidding the rear wheels.

¶ **Either One of Sheldon Double Brakes Will Do It.**

SHELDON AXLE CO., Wilkes-Barre, Pa., U.S.A.

Chicago Branch—68 East 12th Street
Detroit Branch—1215 Woodward Avenue
San Francisco Branch—444 Market Street

Insure Against Worry —Equip Your Car with the



FEPS CARBURETOR

CAN there be any question in the minds of motorists today that a considerable majority of motor troubles are traceable to imperfect carburetion? The carburetor has always been a source of dissatisfaction. Practically every other undesirable feature of motoring has been overcome, every other inefficient part perfected — but carburetors are today the big worry, and almost the only one, to the automobile owner.

At last there is "one way out," equip your car with the Feps Carburetor; experience the peace of mind that comes only with the knowledge of absolute certainty, learn for the first time the top notch efficiency of your car.

Why? Because the Feps will increase the power and speed of your motor in an astonishing degree, making it so intensely flexible that the slightest movement of the throttle finds immediate response. It will give a perfect gas mixture at all speeds with any grade of gasoline, and with all this, it will give you 25% to 50% increase in mileage per *gallon* of fuel. It also embodies a never-failing quick starting device. Yes; we know it sounds impossible; that's why we let you prove all these statements on *your car at our risk.*

Write Dept. "F" for Descriptive, Illustrated Booklet

A GIANT IN POWER FEPS A MISER IN FUEL

Schoen-Jackson Co.

Media, Pa.

A GIANT IN POWER FEPS A MISER IN FUEL

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Lancia

AMERICA'S FAVORITE FOREIGN CAR SOLD AT AMERICAN PRICES

Lancia cars, made in Europe, offer the American buyer every European point of superiority in material, engineering features, workmanship, design and finish—and it is conceded that car building methods which obtain on "the other side" are years in advance of American methods.

And American Dealers can sell Lancia cars at American prices.

You, Mr. Dealer, know that limited quantity production insures the ***personal attention*** of every man engaged in the building. Lancia production is typically European because it *is* limited. Here are no American cut and dried operations that produce quantity at the heavy expense of quality.

Lancia dealers use these arguments as the basis for selling arguments.

Car wise buyers who want European automobiles are quick to grasp and act upon them.

There is some choice territory awaiting dealers who are looking for that ***different and better car.*** Are you such a dealer?

DEALERS WANTED

ADAMS-LANCIA COMPANY

238 West 58th Street New York City

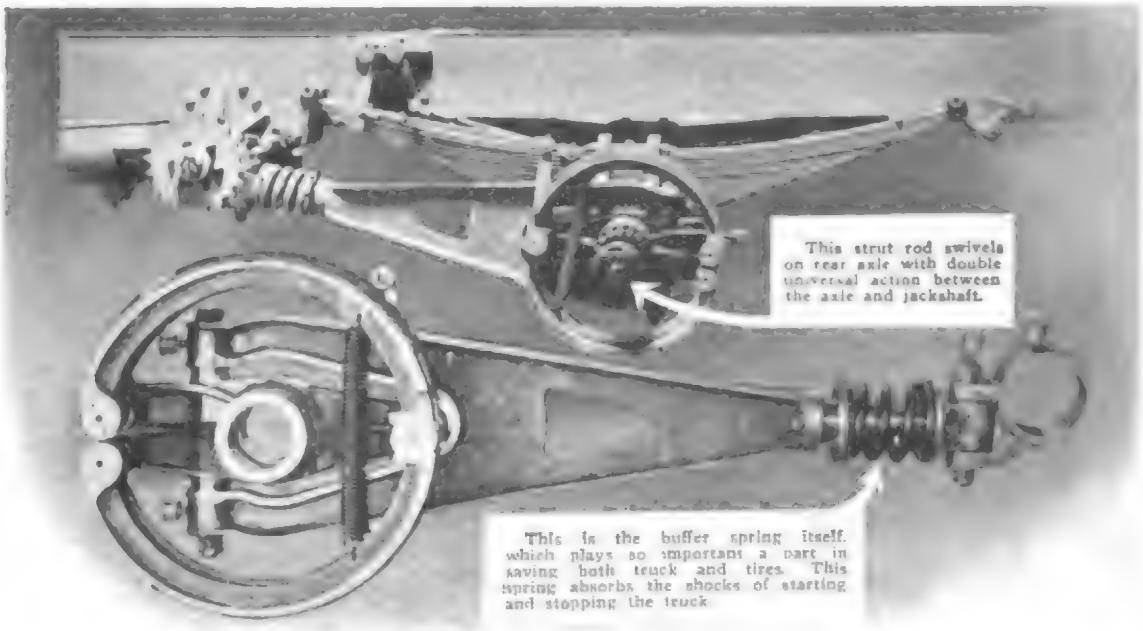


THE ATTERBURY

The United States Government has accepted Atterbury truck specifications, and placed orders with us for a large number of 1,500 pound delivery trucks, to be used in parcel post delivery work. Where the Government leads, it is safe for the ordinary buyer to follow.

Do you know there are certain accepted standard specifications covering material and workmanship, motors, frames, tires, etc., which are practically fixed for trucks of different sizes? We have not followed these specifications, **we have made these ourselves,** with the result that our trucks, as now produced, lay down the standard of truck construction in America.

These machines incorporate at least a dozen radical and advanced features which are now known to be absolutely essential to the successful operation of a motor truck. The illustration shows one feature of design that has already made Atterbury trucks famous; that is the exclusive Atterbury radius rod, with end buffer spring, so designed as to permit of two vertical and two horizontal motions, without throwing any strain upon the truck itself.



In addition to unequalled design, appearance, finish, accessibility of working parts and low cost of upkeep, we offer agents a complete assortment of machines from a 1,500 pound shaft drive delivery wagon up to and including one, two, three and five ton sizes.

Besides this, our prices are the lowest, and our discounts the best. Our campaign of advertising which is being directed to truck consumers has created a general responsive interest in the Atterbury line.

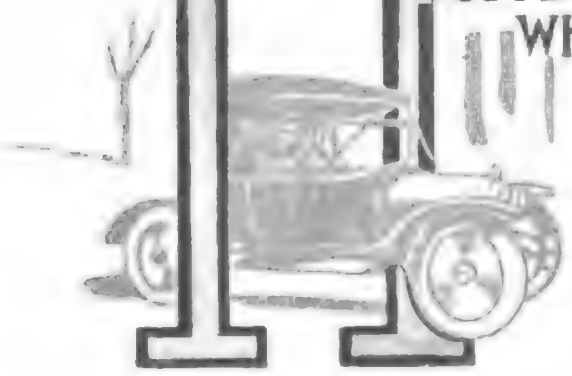
Join the "live" ones who have identified themselves with the most representative and best selling truck in America.

THE ATTERBURY MOTOR CAR COMPANY, Buffalo, New York

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HOFFECKER SPEEDOMETERS

HOFFECKER IS TO A SPEEDOMETER WHAT WALTHAM IS TO A TIMEPIECE

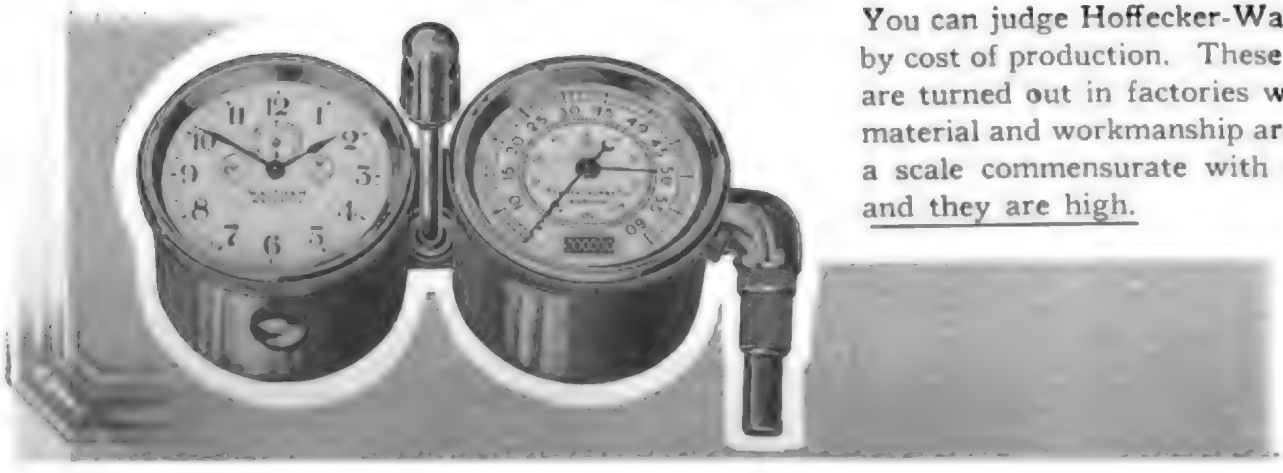




Write to your car manufacturer—tell him to equip the cars you sell with Hoffecker Speedometers and Waltham Time Pieces—then you are selling another important item of service.

Hoffecker is to a speedometer what Waltham is to a time piece—both names stand for quality of product known and used wherever cars are found.

You cannot find better instruments anywhere at any price—and the fact that we can sell this combination to manufacturers at moderate cost emphasizes this argument.



You can judge Hoffecker-Waltham worth by cost of production. These instruments are turned out in factories where design, material and workmanship are paid for on a scale commensurate with our ideals—and they are high.

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WALTHAM TIMEPIECES

HOFFECKER IS TO A SPEEDOMETER WHAT WALTHAM IS TO A TIMEPIECE



We subordinate selling cost (which is overhead) to cost of production, and to do this we concentrate our advertising in a group of publications that reach prospective car owners and owners only. A sample two-page spread of this advertising is shown here.

You, as a dealer, get the benefit of this advertising—it reaches the people to whom you sell cars and accessories.

The car manufacturer gets the money we save (through economical, effective advertising) in the shape of the highest grade instruments at prices he can well afford to pay.

Again we say:

If you want to help your prospective car owner to exceptional speed and time recording service, then specify Hoffecker Speedometers and Waltham Time Pieces.





Section
Fisk Town Car Tread Tire

EISEMANN

Stop Shifting Your Gears When You Come to a Hill!

IF you want to know just how easily that engine will climb any ordinary hill without gear shifting and without pounding and knocking, see that an Eisemann magneto with automatic spark control is the source of ignition current.

In climbing a hill, the engine is bound to lose some of its momentum and slow down to a relatively low speed. This means retarding the spark, to prevent pounding and loss of power. Every driver, however, knows, that it is hardly possible with an ordinary manual controlled magneto to get a spark at full retard-position and low speed, when the engine works on a heavy hill—or in other words with the highest compression.

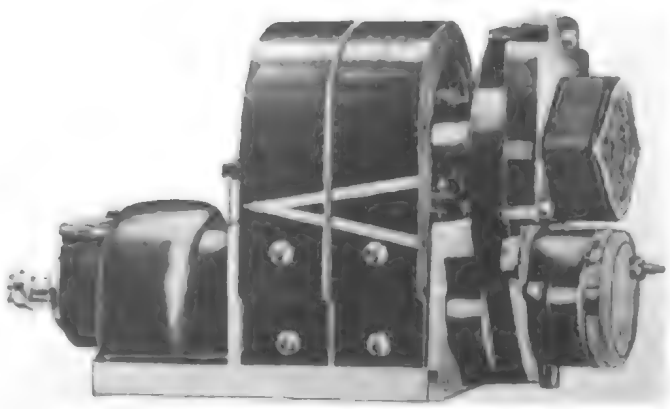
With the Eisemann magneto, with automatic spark control, when the engine slows down the governor automatically retards the magneto by changing the position of the armature in relation to the driving shaft. This solves the problem of correctly retarding the spark with the retarding of the engine speed, but it accomplishes this feat without diminishing the spark. As a result the automatic spark control magneto in climbing a hill ignites the full charge at exactly the right moment and with a maximum spark —consequently with maximum power resulting and the necessity of gear shifting eliminated.

The Eisemann Magneto Company

General and Sales Office:
225-227 West 57th Street, NEW YORK

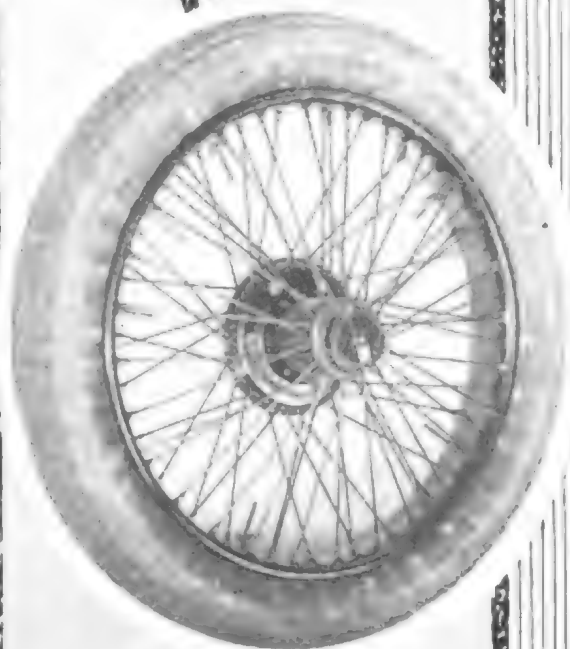
INDIANAPOLIS, IND.
514 North Capitol Avenue

DETROIT, MICH.
802 Woodward Avenue



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McCUE WIRE WHEELS



AGAIN

At the Boston Show

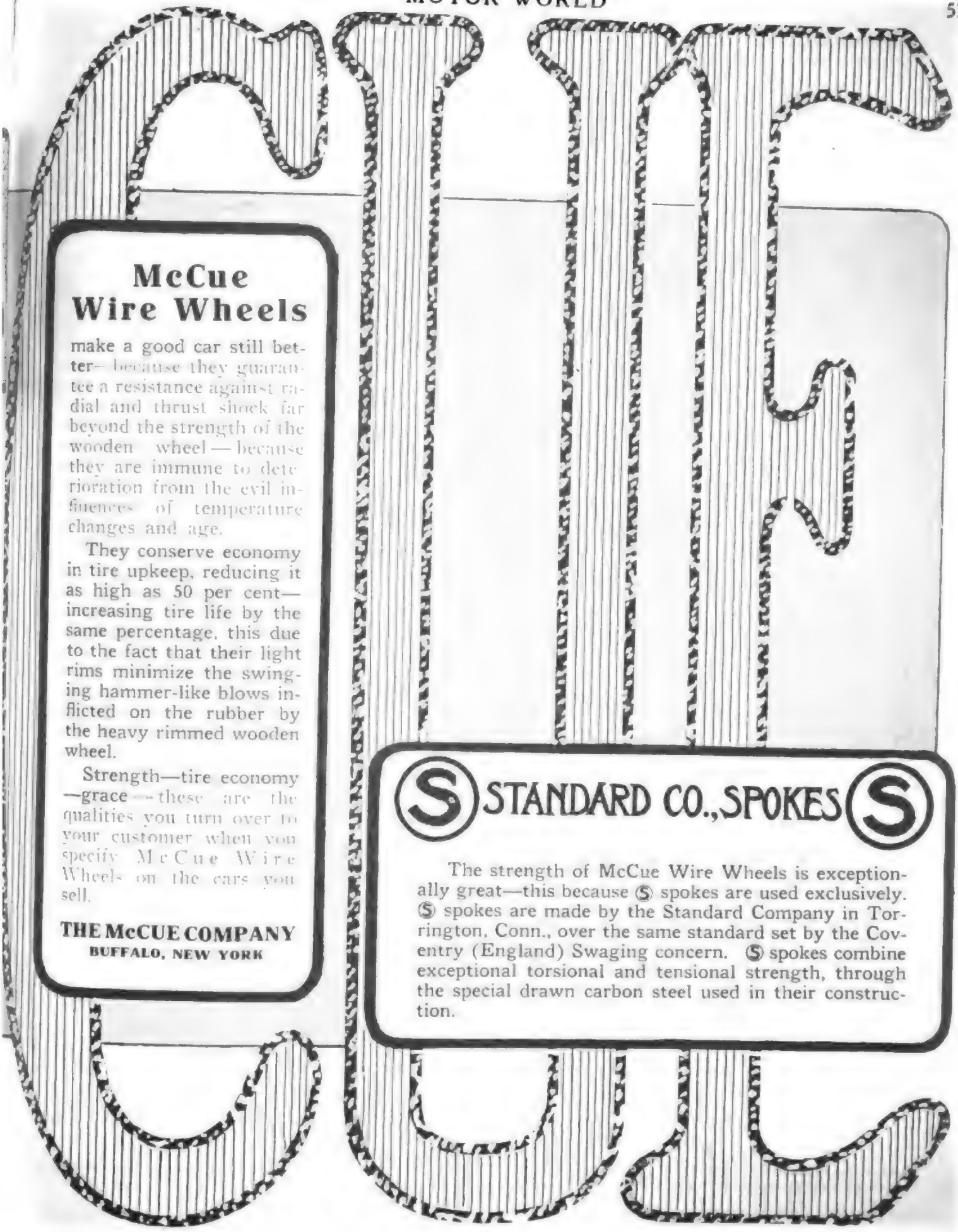
McCue Wire Wheels proved the oft repeated statement that **Wire Wheels have come to stay.**

At this, the last national exhibition of the season, there were even more wire wheel equipped cars, more interest, more favorable comment thereon, than at any previous show.

Many dealers who read this advertising have seen these wonderful wire wheel expositions at the different shows—they will be responsible for forthcoming demand which is bound to follow. **Wire wheels are inevitable.**

You, Mr. Dealer, if you do not know what these wheels mean to the car and to the owner—**write** and ask us about them.

Digitized by Google



McCue Wire Wheels

make a good car still better—because they guarantee a resistance against radial and thrust shock far beyond the strength of the wooden wheel—because they are immune to deterioration from the evil influences of temperature changes and age.

They conserve economy in tire upkeep, reducing it as high as 50 per cent—increasing tire life by the same percentage, this due to the fact that their light rims minimize the swinging hammer-like blows inflicted on the rubber by the heavy rimmed wooden wheel.

Strength—tire economy—grace—these are the qualities you turn over to your customer when you specify McCue Wire Wheels on the cars you sell.

THE McCUE COMPANY
BUFFALO, NEW YORK

Ⓢ STANDARD CO., SPOKES Ⓢ

The strength of McCue Wire Wheels is exceptionally great—this because Ⓢ spokes are used exclusively. Ⓢ spokes are made by the Standard Company in Torrington, Conn., over the same standard set by the Coventry (England) Swaging concern. Ⓢ spokes combine exceptional torsional and tensional strength, through the special drawn carbon steel used in their construction.

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BEGGING YOUR INDULGENCE

The Tremendous Demand for

Electric CUBIT Horn

From Dealers All Over the Country Has Placed Us in an Embarrassing Position.

We Can't Keep Up With Demand

and sixty days, more or less, will be necessary to enable us to fill orders as received and to complete the orders for

Hundreds of Thousands

of these wonderful electric signals already in hand.

Digitized by Google

When We Began to Advertise the

Electric CUBIT Horn

We Anticipated That Its Quality and Price Would Create a Sensational Flood of Orders, But We Underestimated, at That.

We knew we had a worthy successor to the unworthy bulb horn—one infinitely superior in volume of sound, tone, ease of operation and looks—but we placed our calculations on production too low.

Dealers—Kindly Bear With Us

We Will Satisfy You Shortly

Nonpareil Horn Manufacturing Company

73-75 Wooster Street, New York

Factory: 299 Ocean Avenue Jersey City, N. J.

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JEFFERY-DEWITT CO. DETROIT, MICH. SPARK PLUGS

JEFFERY-DEWITT CO. DETROIT, MICH. SPARK PLUGS

$1.00 75¢ 75¢ 75¢ 75¢ $1.00 $1.25 $1.25 $1.25 $1.25 $2.00 $1.50

JEFFERY-DEWITT CO. DETROIT, MICH.

Around This Famous Trade-Mark Is Grouped the Finest and Most Popular Line of Spark Plugs in the World

One Look Tells All

Wise motorists by tens of thousands in 1912 demanded this plug with the window in the porcelain. For it locates ignition troubles at a glance—without testing, without unscrewing the plug, without fuss of any sort.

This is truly a marvelous invention; and 1913 will bring orders in a countless flood.

The heat-defying porcelain, the unbreakable metal parts, and the moderate price, also help toward enormous sales.

Send for the J-D booklet at once, telling all about this plug and the others of the line.

Dealers:

Will you Share in *J-D* Profits?

Write for Particulars.

Do It Now!

Another Leader

Every motor man in your town who has an over-oiled engine will be your everlasting friend and customer when you handle this plug—the J-D Conical (or Petticoat) with closed end and platinum points. In oily engines it is supreme. Its sales in all parts of the world are enormous.

J-D dealers everywhere find this plug a wonderful repeater—the surest sign of merit.

Get in touch with headquarters and make this one of your leaders, if you have not already done so.

65 Butler Avenue— JEFFERY-DEWITT COMPANY —Detroit, U. S. A.

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Hyatt Quiet Bearings



HEAT treating is an extremely important feature in the manufacture of the Hyatt Roller Bearing. By it the elastic limit or strength of the materials as well as the resistance to wear is increased over two and one-half times.

Uniform results are obtained by the standardization of materials—accurate temperature control—and the frequent testing of specimens to insure the prescribed physical results. These operations are under the personal supervision of competent metallurgists.

All Hyatt Flexible Rollers are now made of alloy steel and heat treated.

HYATT ROLLER BEARING CO.
DETROIT. MICHIGAN
Works, Newark New Jersey

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WHY DO THEY SMILE?
IT'S A Knox "LITTLE-SIX"
"IF YOU HAVE NEVER DRIVEN ONE UP A HILL YOU HAVE MISSED HALF THE SPORT OF MOTORING"
CATALOGUE MAILED ON REQUEST
KNOX AUTOMOBILE CO.
SPRINGFIELD, MASS.
NEW YORK BRANCHES CHICAGO

AT LAST!!

A gasoline gauge for automobiles that is accurate and dependable---up hill, down hill, on side list and on the hottest and coldest days, shows at a glance the amount of gasoline in the tank



The Dependo GASOLINE GAUGE

(ATTACHES TO THE DASH)

$7.50 Brass or Nickel Finish

SOME OF ITS MANY ADVANTAGES

No more Dry Tanks miles from a garage.

No more pulling up cushions to run measuring stick into tank.

Detects Leaky Tanks immediately.

Shows instantly amount of gasoline going into tank and amount being consumed per mile.

As dependable as your watch, and will not get out of order.

Full directions for installing sent with each gauge.

Supplied at present for the 1912 and 1913

Ford, Overland, Buick, E. M. F. and the 1913 Studebaker

When Writing State Model

If for other cars, send us name, model and year, and we will notify you if we can supply you. Not made at present for cars having pressure tanks.

If your dealer cannot supply you, we will direct, on receipt of price.

Catalog No. 9 giving full particulars sent free

A WORD TO DEALERS

Dependo Gasoline Gauge is the first and only dependable one ever invented. Yet you know the demand for a gauge of the character of Dependo has been and is insistent. Our campaign of national advertising which starts March 1 will surely augment that demand and show how Dependo will surely fill that demand to the letter.

You will have many calls for Dependo. Why not stock Dependo at once and thus be able to fill orders promptly. Our proposition to dealers means dollars to you. Write us today for full particulars and catalog.

C. F. ROPER & COMPANY, Hopedale, Mass.

Are you watching the growth in motorcycling?

Many manufacturers of automobile accessories can find a profitable field for extending their business by adapting some of their specialties to the requirements of the motorcyclists

Over 80,000 motorcycles will be built in 1913

and all these motorcycles will require tires, magnetos, carburetors, spark plugs, bearings, lamps, batteries, horns, chains, motors, oils, speedometers, rims, gears and forged and manufactured parts of all kinds

You can reach this growing field

by advertising in

THE BICYCLING WORLD AND MOTORCYCLE REVIEW

The oldest cycling journal published and the recognized authority on motorcycling and all allied subjects

SAMPLE COPY AND ADVERTISING RATES GLADLY SENT ON REQUEST

Bicycling World and Motorcycle Review

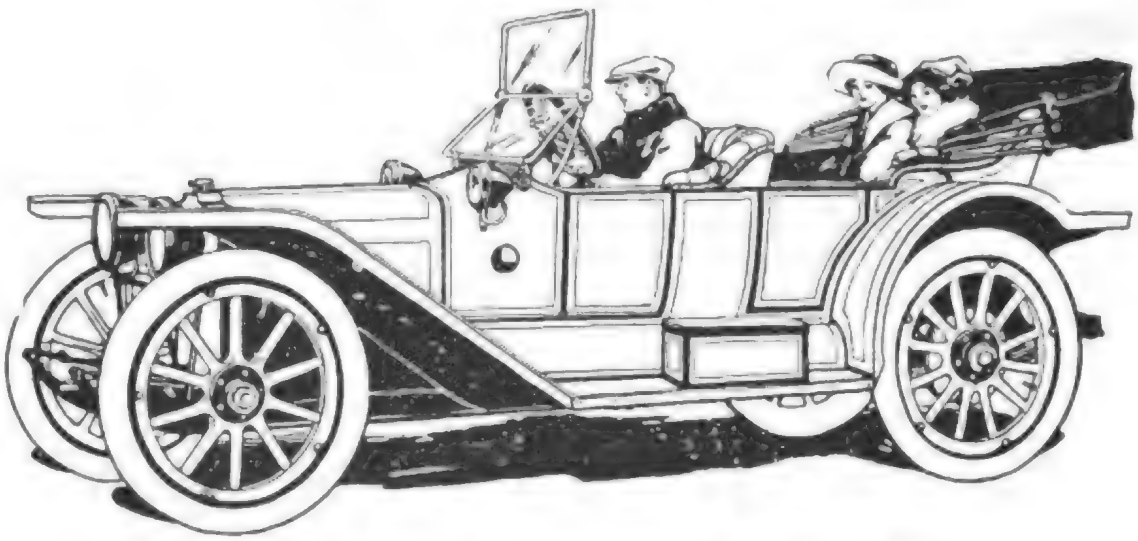
Mecca Building, 1600 Broadway - - New York City

Digitized by Google

Electrically Lighted

AMERICAN UNDERSLUNG

Electrically Started



The "American Tourist" (Type 34-A) $2350—Complete

Bigger Road Clearance

WHEN you drive an "American Underslung" you need not fear thank-ye-marms, country railroad crossings or road unevenness—no matter how serious, they can not strike a vital point.

The "American Underslung" has a road clearance of 12¼ inches. Contrast this safety with the fact that 85 per cent of all the domestic conventional overhung cars have an average clearance of only 11¼ inches.

But better still, the "American Underslung" with its greater road clearance has a straight clearance line. Neither the flywheel nor engine pan is forced to withstand any possible shock. It is taken on the sturdy, re-inforced "American Underslung" frame.

The men who have adopted the "American Underslung" have never gone back to the old-fashioned type of car. Greater clearance is one of their very best reasons.

Write us today for our interesting book, "The Advantages of Underslung Construction."

The "American Scout" - - - $1475 Complete
The "American Traveler" - - - $4500 Complete
(Improved Electric Starter with Tourist $150 Extra)

Please Address Dept. E

American Motors Company, Indianapolis, Indiana

No-Rim-Cut Tires---10% Oversize

On Show Cars Goodyears Lead by 43.4%

At the 37 Shows held up to this writing, the average Goodyear lead has been 43.4 per cent.

In New York they led by 108 per cent. In Chicago, 118 show cars were equipped with these favorite tires. That broke every Chicago record on any make of tire.

For three years now Goodyear tires have led on cars equipped for exhibit.

But this year's lead is decisive. No other tire came within range of the Goodyears. At some leading Shows more Goodyears were shown than of all other tires together.

890,680 Go on 1913 Cars

We have contracts this year from 107 of the leading motor car makers. These contracts call for 890,680 Goodyear tires to go on this year's new cars.

That's enough to equip 222,670 cars. And that means a very large percentage of the 1913 cars.

Those facts show clearly what users demand, in the judgment of men who know.

12 Years' Demand in 1

Last year's output of Goodyear tires by far exceeded our previous 12 years put together. Yet that output failed to supply the demand by some 400,000 tires.

We now are building about 6,000 tires daily. That's enormously larger than the record output of any other plant in the world.

The demand from users is running at present twice as large as last year.

2,000,000 Salesmen

About two million Goodyear tires have now gone into use.

Those two million tires, on hundreds of thousands of cars, are the salesmen who sell Goodyears.

Make no mistake. Men in these days are not buying tires blindly. They are watching mileage figures. This sensational demand for Goodyear tires has come with the vogue of odometers.

A year ago, a million of these tires had gone out to tell their story. And the story they told, in the next 12 months, sold a million more.

Wastes That Must Stop

This simply means that men have decided to end rim-cutting waste.

Statistics show that 23 per cent of all old-type tires become rim-cut. All this loss is ended forever by Goodyear No-Rim-Cut tires.

It also means that men want oversize. No-Rim-Cut tires, in air capacity, are 10 per cent over the rated size. And that 10 per cent oversize, under average conditions, adds 25 per cent to the tire mileage. Men want that 25 per cent.

It also means that men demand tires built as well as men can build them. Legions know they get them in the Goodyear tire.

GOODYEAR
AKRON, OHIO

No-Rim-Cut Tires

With or Without Non-Skid Treads

These are facts to consider. To you men who sell tires, and you men who use them, they are full of meaning.

This 14-year verdict, based on two million tires, is too overwhelming to be disregarded.

Write for the Goodyear Tire Book — 14th-year edition. It tells all known ways to economize on tires.

THE GOODYEAR TIRE & RUBBER COMPANY, Akron, Ohio

Branches and Agencies in 103 Principal Cities. More Service Stations Than Any Other Tire.

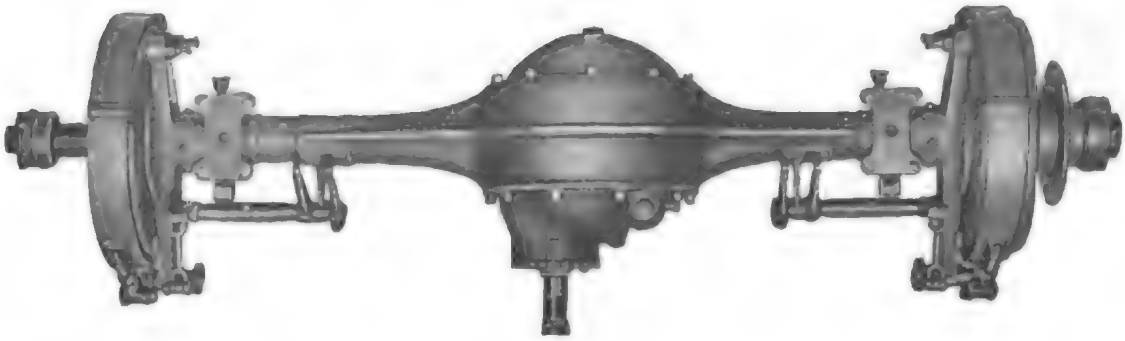
We Make All Kinds of Rubber Tires, Tire Accessories and Repair Outfits.

Main Canadian Office, Toronto, Ont. Canadian Factory, Bowmanville, Ont.

(1012)

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American Axles



Their Essential Features Are Patented Features

Your car is only as safe as its axles are dependable.

The marvel of the motor car—its ability to make with security upon the rough highway the speed with which an express train glides on steel rails—is largely a matter of axle efficiency. Or—to make the analysis complete—of axle durability, axle silence **and** axle efficiency.

And these three requisites are dependent upon the correctness of the design; upon the experience of the workmen, and the mechanical equipment engaged in the execution of that design.

In the case of the *American Axle* the essential features of construction by which these three all-important characteristics are secured, are patented features.

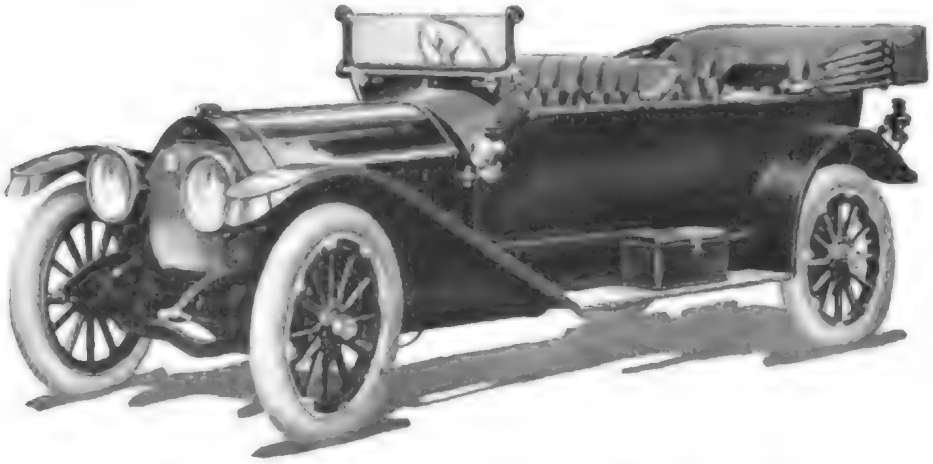
Moreover, some of these patents are so fundamental and so inclusive in scope, that they may be accepted as literal definitions for axle constructions embodying the three qualities: durability, silence and efficiency.

Your car should have *American Axles* because their efficiency spells economy to you.

THE AMERICAN BALL-BEARING COMPANY

Cleveland, Ohio

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Comfort is engineered into the KisselKar

COMFORT is built into the KisselKar, not merely added on. The aim of KisselKar design has been to prevent the undue side lurches, sways and shock of road travel, not merely to modify them by spring action and upholstery.

Ride in a KisselKar—you will discover how this fundamental comfort, engineered into the KisselKar, plus all the added refinements of comfort, brings a new mildness to motoring—a steadier, lighter motion, free from sways and lurches—a riding ease that immeasurably surpasses ordinary ideas of car comfort.

KISSELKAR

The balance of the KisselKar makes it exceptionally sensitive to the steering wheel, and agile in picking the road. The flexible motor does away with the gear-shifting in ordinary driving, enabling you to drive as slow as needed, and climb hills on fourth geared up speed. "Thirty" $1700—"Forty" $2000—"Fifty" $2500—60 H. P. "Six" $3150. Electric started and lighted—fully equipped.

Write for big illustrated catalog—the 1913 KisselKar catalog illustrates the entire KisselKar line of pleasure models, and describes KisselKar design and construction. It will give you a new standard by which to judge automobile values.

KisselKar Trucks—1500 lb., 1, 1 1-4, 2, 3, 4, 5 ton Trucks, Delivery Cars, Fire Department Apparatus, Ambulances, Police Patrols, Hearses.

Kissel Motor Car Co., 159 Kissel Avenue, Hartford, Wis.

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TIMKEN
BEARINGS & AXLES



Timken Tapered Roller Bearings on the spindle of a Timken-Detroit Front Axle for Pleasure Car.

THROUGH how many miles of road service will the bearings in your car stand up—and give *full* efficiency?

How long will they carry the weight of car and load, meet the hammer blows from jolts over rough city pavements and car tracks, from deep-rutted country roads?

How long will they keep shafts in alignment, keep gears in correct mesh, hold friction down to near nothing—save power?

These questions strike the root of the economy, the satisfaction and the safety of year after year operation of your motor-car.

The Timken Tapered Roller Bearing is the one anti-friction bearing whose principles of design enable the effect of wear to be wholly eliminated by adjustment without the least sacrifice of its efficiency.

Because it is adjustable perfectly for wear; because the line contact of its rollers enables it to support greater load and stand greater shocks; because its tapered construction enables it to meet end-pressure as well as vertical load—The Timken Tapered Roller Bearing is found in the wheels of the great majority of American motor-cars, both pleasure and commercial, and in many leading foreign cars as well.

The life-time efficiency of the Timken Roller Bearing is also one of the fundamental reasons for the success and wide adoption of Timken-Detroit Axles.

It will pay you to learn more about these essential parts of the car—bearings and axles. You can do so by sending for the Timken Primers T-7, on Bearings; T-8, on Axles. Sent free postpaid on request to either address below. Write today.

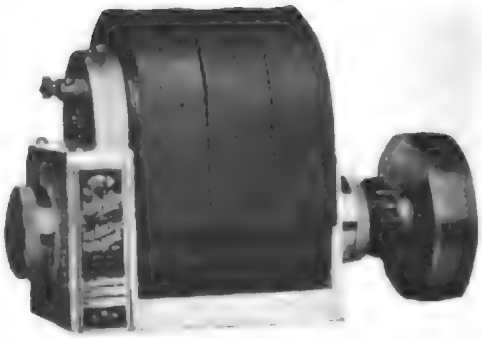
THE TIMKEN ROLLER BEARING CO.
Canton, Ohio

THE TIMKEN-DETROIT AXLE CO.
Detroit, Mich.

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Auto-Liter



The "Auto-Lite" Starter and Lighter

Insures Simplicity, Efficiency, Service

THE "AUTO-LITE" electrical starting and lighting device has the great advantage of simplicity. There are but two units, operating on a 6-volt current. With the fewest possible parts—and these parts easily accessible and adjustable—our device presents no complications to puzzle those unskilled in electricity. The "Auto-Lite" is designed to be built into and as an integral part of the power plant and to operate constantly with the minimum of attention.

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We have built up a business which warrants the strongest guarantee of service. Our plant, one of the largest in the country devoted solely to the manufacture of starting and lighting devices, is equipped with the most modern labor-saving machinery money will buy. We are ready at all times to produce an output which is denied to concerns with less complete equipment.

No demand is too large for us. We are turning out thousands of "Auto-Lite systems every week—and have facilities for greatly increasing our production instantly.

Manufacturers cannot but be impressed by our capacity for prompt service on large deliveries.

We have an attractive proposition for dealers on electrical lighting alone.

Every prospective purchaser should know our devices. He will insist that the car he buys be equipped with the "Auto-Lite" lighting and starting system.

We have illustrated catalogues and literature which are interesting and highly important to every manufacture, dealer and prospective purchaser. A post card request will bring them. Write today.

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Main Office and Factory, Toledo, Ohio

BRANCH OFFICES: **New York** **Kansas City** **San Francisco**

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METALLURGIQUE

The Car You Can Sell to Men of Means and Fine Discrimination

¶ Are you in a position to locate and interest men of means, social standing and ability to recognize a car of impressive individuality, tremendous prestige and sterling performance.

¶ If so, we will use our sales organization to assist you in selling the Metallurgique, Europe's most talked of car and the one most sought after.

¶ This automobile is the product of fifty years steel making near Brussels, the Pittsburgh of Europe. In materials, it stands alone in quality. Its chassis is a revelation in construction that has given it a proven title, "The unbreakable car." In body design it is a model of sensational European originality that causes even the blase New Yorker to turn to admire.

¶ Metallurgique dealers have as sales ammunition a list of owners that reads like the International Social Register. Write for our beautiful brochure—it will introduce us.

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W. C. & H. ALLEN, Proprietors

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The final test of the efficiency of a motor truck is service. The sale of a Kelly truck is only the beginning of our responsibility.

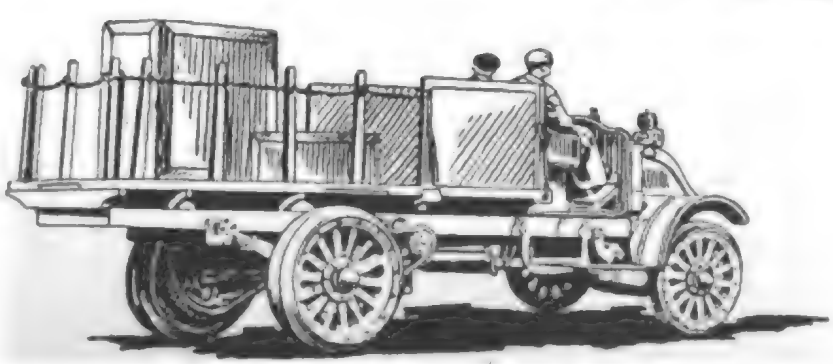
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That's Kelly Service

Kelly

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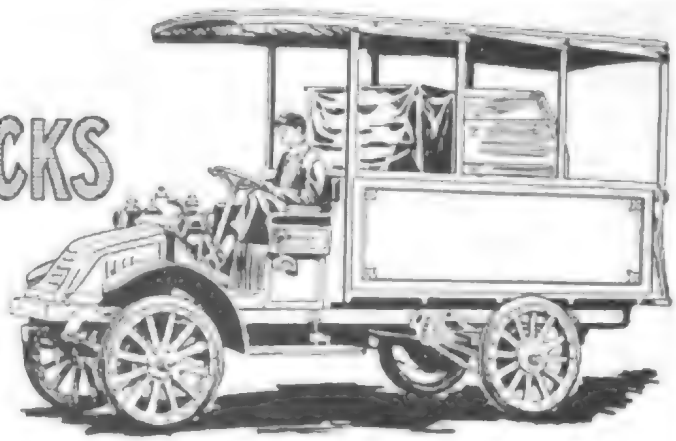
Kelly service is legitimate service in every sense. We can give this real service because we have built up the entire Kelly organization with that idea in mind.



The Kelly
1031 Bu

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AND GOOD SELLING TRUCKS



You have to know Kelly Service before you can really appreciate what it means to our dealers.

Fourteen Factory Branches To Help Our Dealers

We operate well equipped factory branches and service stations in the following centers:

Boston	**Dallas**	**Chicago**
Providence	**San Francisco**	**Kansas City**
Worcester	**New York**	**Seattle**
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Kelly

No matter where you may be, you are within a few hours of one of these service stations. The necessary parts or equipment for any repairs can be dispatched to you from one of these stations without an instant's delay. The advantage of this plan can be seen readily by those who have often been compelled to wait many days for repair parts to be sent from a distant factory.

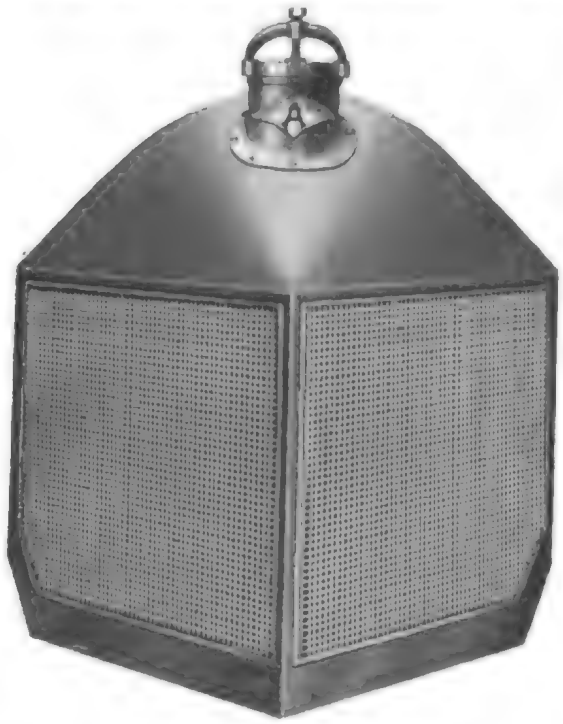
Let's get acquainted. Let us tell you more about our proposition.

Springfield Motor Truck Company

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In producing an all-round efficient car, latter day engineers take no chances on parts that will "lay down" under hard work.

Inefficiency of a part is not blamed on the maker of it—but on the maker of the car.

Fedders Radiators are standard on a large line of America's best known cars and trucks that are making good.

Fedders radiators cannot clog—the square tube design makes this impossible. They cannot boil, under correct working conditions, because all four sides of each tube are surrounded by water—free circulation and ample cooling are insured.

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We specialize on square tube design but we have ample facilities to build in large or small quantities over your specifications. Our engineering department is at your disposal.

FEDDERS MANUFACTURING WORKS
BUFFALO, N. Y.

Don't Put Poor Cable Into a Good Car

Your reputation
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All of these depend upon the future performances of each car.

The difference between cars that require little attention and cars that require constant attention often lies in the kind of cable used in wiring the car.

Ask the manufacturer or owner of any of the high class cars why he doesn't have lighting, ignition or other troubles. He will tell you it is because his car is wired with

Packard CABLE

Saves rewiring of cars.

Once you put Packard Cable into a car the wire question is settled during the life of the car. You won't have any "comebacks" from dissatisfied owners.

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The Packard Electric Co.
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THERE'S a difference between results obtained from **any** spark plug and the **right** spark plug, one possessing every refinement of manufacture, every result that extensive investigation could produce, nothing omitted—nothing neglected.

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Don't fail to write today for Interlock Booklet which tells all about Interlock Inner Tires, and gives many new tire pointers of the greatest value to every automobile owner.

The Interlock is an **extra inside tire** which is placed between the outer casing and the inner tube for the purpose of so strengthening the tire that it will be proof against blow-outs, rim cuts and punctures and therefore last twice as long.

When you know what Interlocks will do, you will want them. They give you practically **two tires on each wheel** with no change in the looks of the tire. With this combined strength you can run your car an entire season without delays, annoyance or tire trouble, and save about half your tire expense.

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Write for our proposition and give the name of your jobber.

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has been silently advertised from coast to coast by the best advertising anybody can have—the personal endorsement of over 100,000 satisfied users.

The Atwater Kent Ignition System has no rival—no competitor. We do not use this term metaphorically, but in a lilteral sense.

You may think this is the use of a trite advertising term, but in this case it is nothing of the kind. That the Atwater Kent has no rival in the opinions of thousands of users has been demonstrated to us many-many times, when in ordering their new cars they have specified that they should be "Atwater Kent equipped."



There are a number of other good reasons for the superiority of the Atwater Kent System over the magneto and it is worth your while as a jobber, dealer or prospective buyer, to weigh and consider them carefully.

Space forbids our mentioning these reasons even briefly, but if you will write for our booklet "D," we will give you some of them. Then ask the motorist who drives a car "Atwater Kent equipped" and he will tell you the others, and the best reasons why the Atwater Kent Ignition System has no real rival.

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All Cars Should Have
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Automobile Tires

There are no "features" that can increase a tire's wear. It's simply a case of rubber against road—with the best rubber wearing the longest. It is the rubber composition in Kelly-Springfield Tires that gives them the mileage record we are proud of.

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Sheffield-Simplex tells of the meritorious performance of Zenith on a run in which "no particular grade of motor spirit was used, we having to be content with exactly what we could get."

Zenith Carburetion is Standard Carburetion

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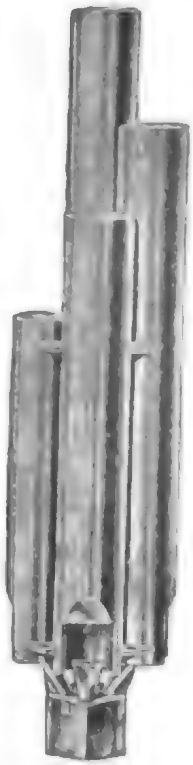
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Patented Jan. 21, 1913 Aug. 20, 1912

WARN THE PEDESTRIAN, BUT DON'T TERRIFY HIM

Mr. Motorist: It's up to you to give persons on foot a courteous, friendly warning—a danger signal that will not rob them of their presence of mind and **literally drive them into danger** instead of **away from it.**

There is just **one, sure, courteous** way to signal your approach—one warning that is distinct and musical, that cheers and does not frighten—that never fails at the crucial moment—

The AERMORE Exhaust Horn

—the Horn Harmonious—

Why You Should Have An Aermore

The Aermore is the only **self-cleaning** exhaust horn on the market. Four melodious tones are blended in perfect harmony. The signal can be regulated by the pressure of your foot to give a low, soft warning or a loud, unmistakable note—not always **musical.** The Aermore cannot clog!

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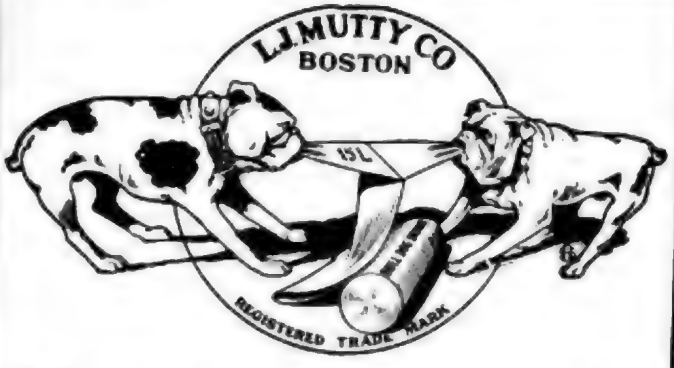
The popularity of the Aermore is national. Its distinctive tones and its low price have created an ever-growing market for it. Order one full size Aermore Horn today. We'll rush it to you. Demonstrate it to your customers. The demonstration **will sell the horn.** The Aermore is made for automobiles, motortrucks, motorcycles and motorboats.

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$2.00 to $5.00

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The LUXURIOUS BROC ELECTRIC

But besides these there are other —and exclusive — features contributing to safety, comfort and satisfaction. Here is one of them:

It is impossible for a Broc to have power on and brake on at the same time. Application of the brake automatically and unfailingly shuts off the power. Warning signals, blow-out fuses and such devices are therefore unnecessary, and no reliance is placed on the driver's memory or caution.

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"FORTY" $1985

The best four-cylinder forty horsepower car on the market with separate electric starting and lighting, and separate ignition systems. The economical four speed forward transmission is another big asset.

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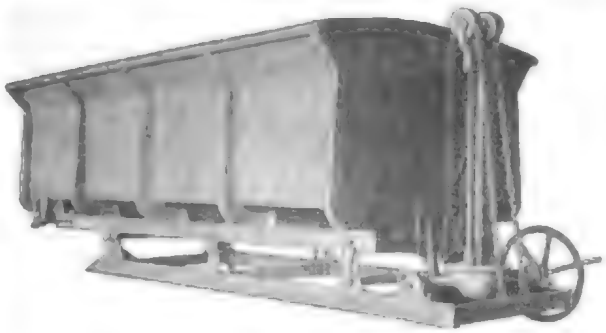
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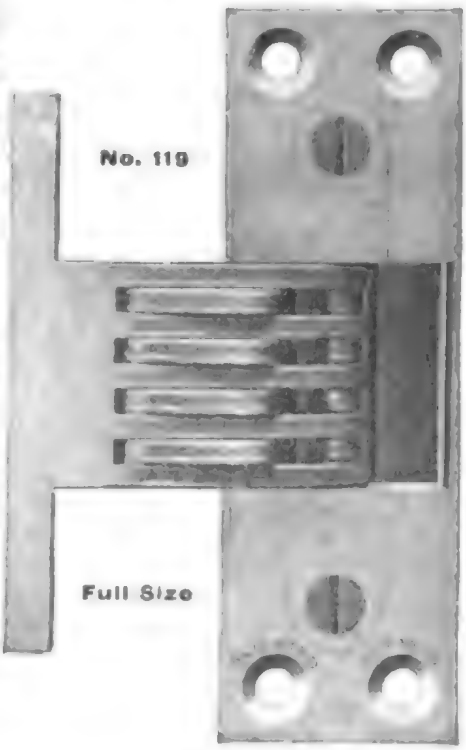
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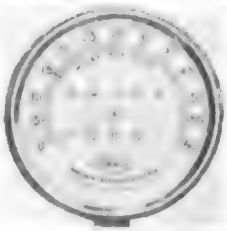
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There Old Dutch Cleanser halves the work—reduces the expense.

Many Uses and Full Directions on Large Sifter Can—10c.



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CORBIN-BROWN SPEEDOMETER

"The Speedometer of Absolute Accuracy"

NOTE these features:

Extreme mechanical simplicity.

Highly sensitive centrifugal governor which responds to the slightest change in speed.

The peculiar construction of the flexible shafting which greatly decreases frictional wear and insures smooth running.

Perfect adaptability to the recording of the lowest as well as the highest rate of speed.

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Universal Tire Pressure Gauge



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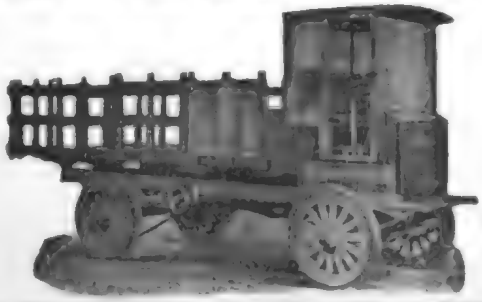
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LAUTH-JUERGENS TRUCKS ARE THE LATEST IN CONSTRUCtion, most powerful in operation and the motors are guaranteed against defective workmanship and material for the life of the truck. They are positively the highest class trucks made. Two cylinder, one-ton, four cylinder, one, two and three-ton. Four speeds forward. Hess-Bright ball bearing transmission made in our own shops of the finest tool steel, three-piece disc clutch, covered by patents owned by us. Send for 1912 Catalog and specifications. Prompt delivery on all models. Large publicity campaign just begun. Our quality will do the rest.

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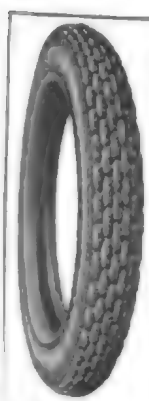
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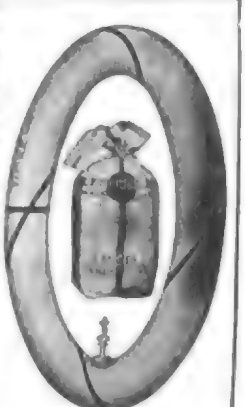
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Give double mileage because of the full-thickness tread under the studs.

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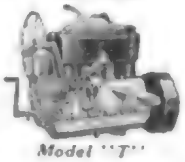
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1913 Specifications

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Models "T", "O" and "Q" can be furnished in unit power plant type of construction.

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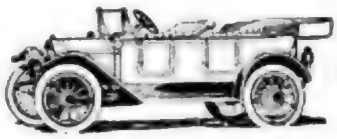
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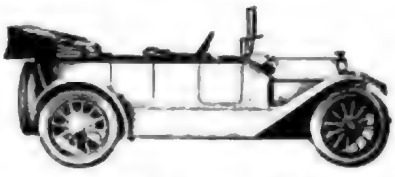
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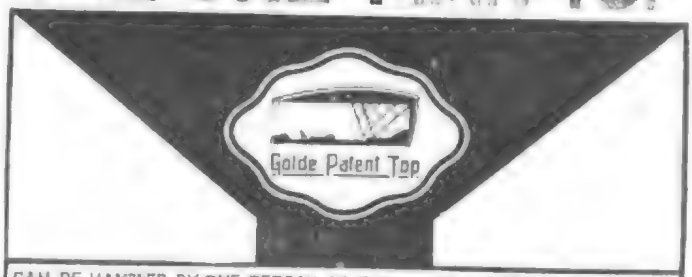
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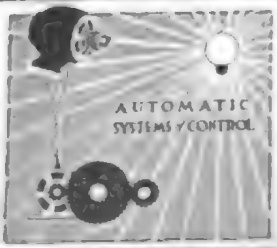
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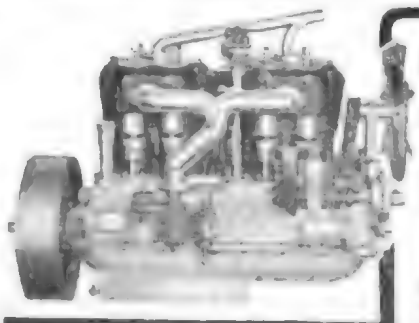


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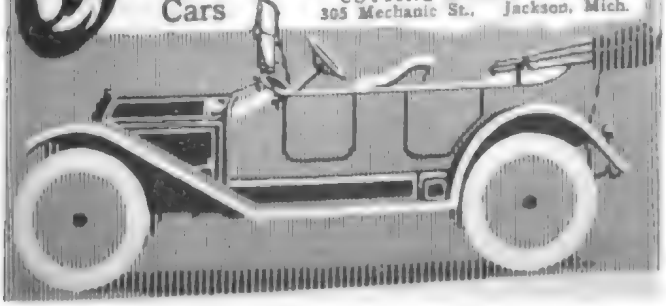
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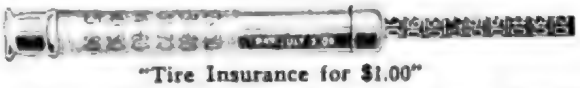


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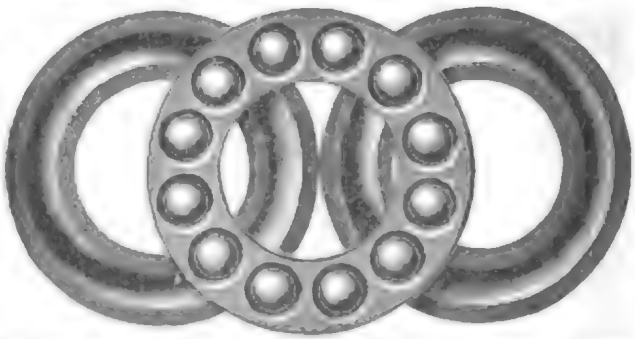


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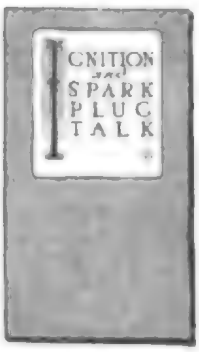
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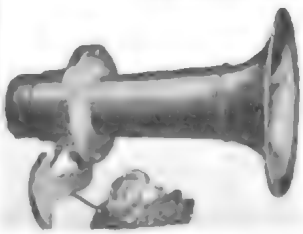


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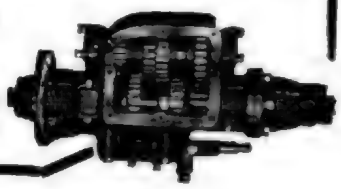
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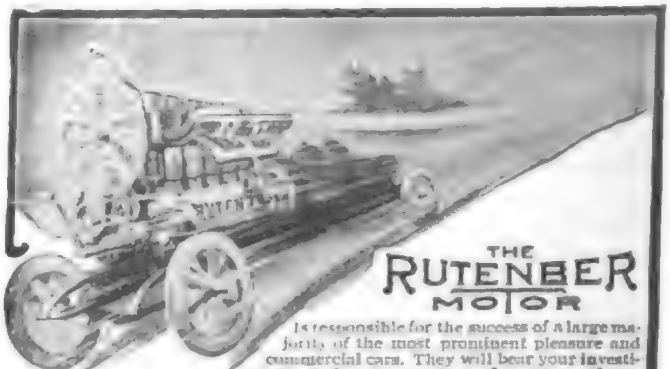
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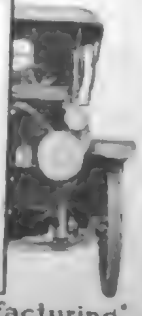
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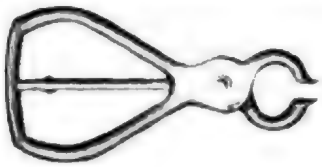


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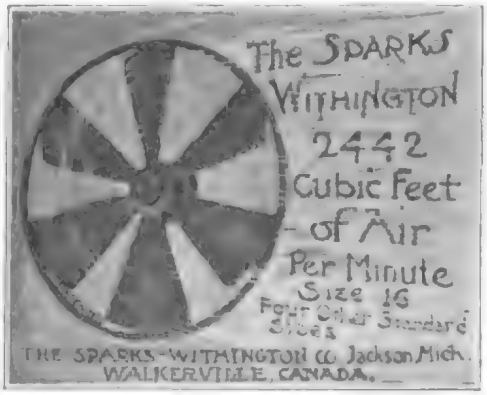
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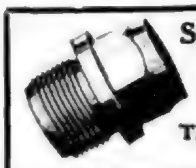
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"INSURANCE FOR BUILDER AND USER"
RHINELAND MACHINE WORKS CO—— 142 WEST 42ND ST. NEW YORK

Reo the Fifth

Final and crowning achievement of R. E. Olds, pioneer designer of Autos. A standard size 30 to 35 horsepower four-cylinder car of modern refinements, priced at only $1,095.

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Special Milled Parts
Cap and Set Screws
Plain and Castellated Nuts
The National-Acme Mfg. Co.
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Look at our new middle name
PENNSYLVANIA
Oilproof
VACUUM CUP TIRES
PENNSYLVANIA RUBBER COMPANY
Branches: Coast to Coast. Jeannette, Pa.



MOTZ Cushion Tires
For Pleasure Cars and Light Delivery Cars
Send for Booklet 58
The Motz Tire and Rubber Co.
Executive Office:
AKRON, OHIO
Service Stations in All Principal Cities

A—Shows double, notched tread.
B—Shows undercut sides.
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We Specialize on
Finishing Crank Shafts
Only.
MICHIGAN CRANK SHAFT CO.
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The ONLY gas tank that when empty, can be immedi tely exchanged for a full one, ANYWHERE and ALWAYS.

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Now standard on fourteen makes of America's leading cars and still growing. Send for blue-prints and specifications—or consult our engineering department.
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THE SELDEN TRUCK—$2000
Sold on Time Payment Plan
Best Agent's Proposition Ever Offered
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will help you to increase your business while benefiting your customers. We will send any responsible dealer a pair on 30 days' trial. Write now. Good Agents wanted for unoccupied territory.
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A tire filler 10 to 20 per cent. lighter than any other tire filler. A big proposition for dealers who are on the alert for more and better business. Write for details.
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"THE MASTER CAR" SIXTEENTH YEAR
6 Cyl. 50 H. P., $5,000 4 Cyl. 55 H. P., $4,500
4 Cyl. 35 H. P., $4,000
(Completely Equipped)
POUGHKEEPSIE F.I.A.T. N. Y.

Mr. Dealer: Look over our "For Sale, Want and Exchange" columns. You will surely find some where among those annoucements a buying opportunity—a straight line to something you want now. Remember that 8,000 other readers are doing the same thing—5,000 of them dealers. All of them intensely interested in the automobile industry. This means a live selling opportunity that costs mighty little.

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¶ Many dealers do not carry Invader Oil because they can buy other oils cheaper.

¶ This is one reason why we supply so many automobile owners direct from our factories and branches.

¶ Remember that Invader Oil is better than other oils—not because we say so, but because its gravity, fire and carbon tests say so.

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"Puts Noisy Gears to Sleep"

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Write for descriptive booklet and prices.

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TIMES SQ. AUTO CO.

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NEW CARS
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At From 20c. to 50c. on the Dollar

We Are the Largest Dealers in the World in New and Used Cars and Factory Cleanups

The Bush Radiator

THE BUSH MANUFACTURING CO.
HARTFORD, CONN.

METZ "SPECIAL" $445

Completely equipped, fully guaranteed. 22½ H.P., 4-cylinder water-cooled motor, Bosch magneto. Artillery wheels, best quality 30" x 3" clincher tires. Makes 5 to 50 miles per hour on the high speed, 28 to 32 miles on 1 gal. of gasoline. You can secure EXCLUSIVE SALE in your territory. Send for Book "B."

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Glare Eliminator Screen for Auto Headlights

Tones down headlights for city driving and foggy nights—an auto necessity. Price 75c. per pair. Sells like hot cakes. Dealers, secure the agency quick.

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The Stutz Has a Powerful Motor—

that will pick up on any road or hill at the touch of the throttle. It has attained a record second to none for consistent performance.

Write today for advance booklet A-15, Sturdy STUTZ Announcement, Series B.

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REGISTERED U.S. PAT. OFFICE

Magneto Plugs coax maximum power out of engine.
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CHAMPION SPARK PLUGS

Special Designs for Every Type of Motor Made

CATALOG MAILED ON REQUEST

CHAMPION SPARK PLUG COMPANY
TOLEDO, OHIO



All Acknowledge the Necessity of

Weed Chains

In one of those friendly after-luncheon, get-together parties at a well known city club, eleven men drifted on to *the subject of the dangers of skidding.* With a single exception each of the eleven owned an automobile, and each had a *skidding experience* to relate, and each felt that *his particular predicament* was the most sensational and startling.

While nearly all had experimented with the various so-called anti-skid tires, and acknowledged their possible advantages when new—yet when it came right down to "Brass Tacks," there wasn't a single one in the crowd but admitted that for *sure results,* for the **absolute elimination** of every possibility of skidding, **nothing even approximated Weed Chains,** and nothing took their place. Every one of the ten owners carried at least one pair of Weed Chains in his car.

Go where you will, put the question to any assembly of automobile owners you like and the verdict will always be the same—"We *can't get along without them.*"

Weed Chains are universally acknowledged to be the only anti-skid device that can be absolutely relied upon at all times and under all road conditions.

Weed Anti-Skid Chains

Insure perfect control and safe, comfortable driving

Don't foolishly pride yourself on taking chances in order to prove your bravery, or to demonstrate your ability as a driver.

Weed Chains are an absolute necessity on both rear tires and to doubly guard yourself against accidents and to make steering comfortable and easy, put them *on the front wheels too.* They cannot injure tires because "they creep"—occupy very little space when not in use—applied in a moment without the use of a jack or other tool.

Take precaution now When you know the folly, the danger, the peril there is in driving your car over icy, slippery, snow covered roads and pavements, why not fully equip your car today with **Weed Chains** for your own protection and for the safety of other road users.

Recommended and sold by all reputable dealers

WEED CHAIN TIRE GRIP CO.
28 Moore Street New York

Manufactured in Canada by
THE DOMINION CHAIN COMPANY, Ltd.
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These Tires for You

Four corps of experts working in four of the best equipped tire plants in the world are operating as a unit to produce

UNITED STATES TIRES

Nothing of the kind has ever before been attempted in automobile tire manufacturing

United States Tire Company
New York



Abbott-Detroit

"The demand of the day is that an organization shall be judged by its product and not by what it claims for itself." Keep this in mind when you examine these 1913 models

MODELS AND PRICES

30-40	Three-client Roadster, 116-inch wheel base	$1700
31-40	7-passenger A. D. 40 Touring Car [illegible]-inch wheel base	$1700
44-60	7-passenger Limousine, Three-Quarter Landaulet [illegible]-inch wheel base	$4075
44-60	7-passenger, Four-door Touring Car [illegible]-inch wheel base	$2000
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ABBOTT MOTOR CO.
WATERLOO & McKEE DETROIT, MICH.
"Built for Permanence" "Guaranteed for Life"

NATIONAL Compound Mixer and Primer

makes any car start easier in cold weather; adds 10 to 40% to power and mileage. Simple, easily installed, guaranteed effective on any motor. Get details and price.

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The Ford Water Circulator

forces the water from radiator through cylinder water jacket, maintaining rapid circulation when car is in motion. Write for descriptive matter if you handle Ford cars.

THE FULTON-McCUTCHAN CO.
1146 Michigan Ave. CHICAGO, ILL.

Send Us Your Inquiries When in the Market for

Sheet Metal Stampings

Estimates Cheerfully Furnished

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UTICA, N. Y.

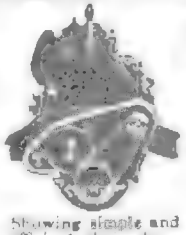
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Spring Suspension

High Grade Only

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The Continental "Six" is maintaining, on the road at this minute, the good name made by our four cylinder types.

Built to accommodate any type of self-starter now made. Suitable for right or left hand drive.

Showing simple and efficient chain drive for starting motor.

4 and 6 cylinders
20 to 70 H. P.

Write for booklets.

CONTINENTAL MOTOR MFG. CO., Detroit, Mich.
Factory Representative, K. P. PETERSON
122 S. Michigan Blvd. Chicago

AS A WARM HAND WHEEL DEALER

You will reap generous profits from easily made sales all over your territory. Every car owner who drives in winter will want this device as soon as he sees it. Write for Details.

THE WARM HAND STEERING WHEEL CO.
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Schafer Ball Bearings

Famous for Their Durability

BARTHEL & DALY
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NON-CARBON STARTER

The Starter Which Really Starts

The successful Starter for Fords as well as other makes. Combined Starter and Lighter, $35. Live Dealers given exclusive territory.

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QUICK SALES—BIG PROFITS FOR DEALERS

Here is an accessory that will not stay on the shelf. It sells on sight.

MARVEL STEAM VULCANIZER

Automatic, therefore safe for rubber. Uses alcohol or gasoline. Low priced. Send for sales plan and sample Vulcanizer.

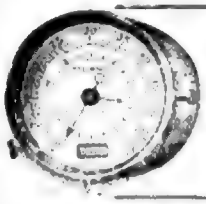
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Highest Efficiency—Good Service Guaranteed

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"The Speedometer of Quality"

Special features that eliminate speedometer troubles. Send for the booklet.

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Quality Windshields

Auxiliary Seats, Bumpers and Gas Starters

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"National" Steam Vulcanizers

GARAGE MODEL repairs three tubes and two casings at a time. Cheapest and best on the market. Get our special selling plan. Portable model for individual owners which will please your customers. List price, $12. Manufactured by

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Mosler Spit Fire Plugs ARE THE BEST

A. F. MOSLER & CO.
P. O. BOX "M"
MT. VERNON, N. Y.

The Otho SYSTEM

for Self Starting Lighting Ignition Signalling

Is right Inside the Flywheel

Otho Motor Co., 60 State St. Boston, Mass.

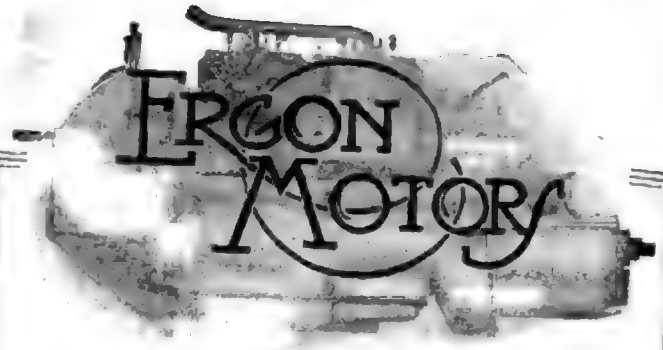
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The Only Non-Skid Tires

Guaranteed for 5000 Miles

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THE CRANK SHAFTS AND CONNECTING rods in Ergon Motors are made by the Driggs-Seabury Ordnance Corp., of Sharon, Pa., who have one of the largest and most finely equipped forging plants and machine shops in the United States.

The crank shafts have three bearings of genuine die cast babbitt. All bearings are adjustable and exceedingly accessible.

The connecting rods are made from a tough high grade alloy steel and the big end is provided with a genuine babbitt die cast bearing dowelled into the rod and cap.

The cap is so constructed and held in place that it is impossible for it to become loosened.

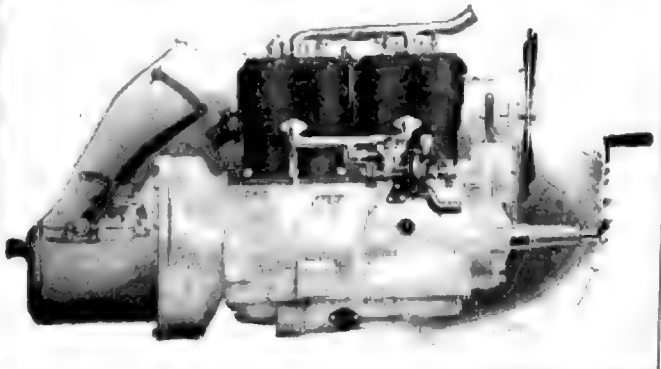
Brass shims take care of adjustments of these bearings.

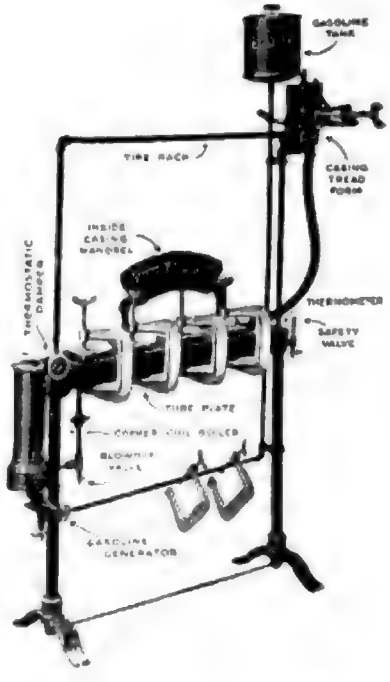
We stand ready and willing to demonstrate by a test that there is no superior to this new line of four-cylinder, four-cycle, long-stroke, water-cooled motors.

Please let us hear from you today with a definite statement of your wants.

HAZARD MOTOR MFG. CO.

Rochester **New York**





Complete Vulcanizing Plant $45

A great money maker for the garage or repair shop. Handles every practicable kind of tire repairing, from a tube puncture to largest casing blow-out.

No experience necessary for its successful operation as the steam pressure is automatically controlled and held at the vulcanizing point. Steam generated in a copper coil boiler that heats the machine as quickly as you can get a tire ready.

Place your order at once and insure delivery of your vulcanizer when you want it. Be prepared to handle the most profitable part of the repair business.

SHALER

Vulcanizers for Every Requirement of Motorist or Repairman

The Shaler line of vulcanizers, the only complete line in the world, includes models to suit everyone from the motorist with one small runabout, to the garage handling large quantities of work. A full line of electric, steam and gasoline heated vulcanizers. Write for catalog today.

C. A. SHALER CO., Waupun, Wis.

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15 cents per line of six words, cash with order. — In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

FOR SALE—Almost new 40 H.P., 5 passenger, 1912 car, electric lights and starter, center control, extra fully equipped, run 2,100 miles, extra good shape. No reasonable price refused. Would consider light late model roadster as part payment. B. N. HEATON, Hoopeston, Ill.

AUCTION SALE OF
One new 1913 ALCO 5-ton truck chassis
and
One renovated rack body for use on said chassis.

At the American Locomotive Company's Service Building, 630 Jackson Ave., in the Borough of Queens, City of New York, N. Y., on Friday, March 21, 1913, at 2 o'clock P. M., the undersigned will offer for sale, and sell at public auction to the highest bidder for cash, one new 1913 Alco 5-ton truck chassis, and one renovated rack body with 4 ft. sides and canopy over driver's seat for use on a 5-ton truck chassis, for the account of John Casmento and the Casmento Roofing Co., 292 Ninth Ave., New York City, N. Y. The chassis and body will be sold separately and they may be inspected any time at the place of sale.

AMERICAN LOCOMOTIVE COMPANY
1886 Broadway, New York.
George W. Keeler, Auctioneer,
12 Vesey St., N. Y. City.

TRANSMISSION, four speed, 60 H.P., A. O. Smith transmission with multiple disc clutch combined. Guaranteed in perfect working order. Price, $20. SCHLOSSER MFG. CO., 151 E. 126th St., New York.

MAXWELL, 14 H.P.; magneto; good tires; $250 complete. 304 Main St., Lebanon, Ohio.

PEERLESS BACK AND CUSHION DRESSING.

For leather seats and cushions. Dries hard on clean leather. The color does not come off. Renews the finish. Ask your dealer.
The Columbus Varnish Co., Columbus, O.

WANTED—First-class repair man to take charge of up-to-date repair shop. Good wages to the right man. Address all applications to Wm. Petry, Inc., Hudson Garage, Hudson, N. Y.

AUTOMOBILE motors; 30 H.P., 4 cylinder, 4½ x 5 Schlosser used motor, suitable for touring car or truck; guaranteed perfect order; price, $90.00; exceptional value. SCHLOSSER MFG. CO., 151 East 126th St., New York.

FOR SALE—10-passenger hotel 'bus, just overhauled and repainted, in excellent condition, ready for service. ZIMBRICH, 21 Plymouth Ave., South, Rochester, N. Y.

AUTOMOBILE salesman wanted on first class car, large commissions given. Apply to C. & C. AUTO CO., 1293 Bedford Ave., Brooklyn, N. Y.

WELDING—Cylinder crank case and crank shaft welded, cylinders rebored, $7.00 to $11.00 a cylinder, including piston and rings. STERLING ENG. CO., 331-333 S. Clinton St., Chicago, Ill.

SPECIAL BARGAIN—An up-to-date fore door gunboat or torpedo body in first-class condition, with top and slip cover. Built by Messrs. Dunham & Son. Can be seen any day except Sunday at 449 Central Ave., Newark, N. J.

MANUFACTURING.

We have complete facilities for making your automobile accessories, electrical or mechanical devices, drop forgings, stamping or machined parts. Correspondence solicited.
CENTURY TELEPHONE CONSTRUCTION CO.,
1738 Elmwood Ave., Buffalo, N. Y.

PEERLESS EXTRA FINE BLACK BAKING JAPAN.

For baking on all metals, no primer, one coat covering solid. Bakes to a high gloss finish in 2 to 3 hours. Can also bake to a semi-gloss and dull finish. Ask your dealer. The Columbus Varnish Co., Columbus, O.

"OHIO" WELDING AND SOLDERING STICKS.

We are manufacturers of high grade Aluminum Welding, Phosphor Bronze Welding and Aluminum Solder Sticks. Sold in quantities of one pound and over. Write for price list. OHIO PATTERN WORKS, 2730 Spring Grove Ave., Cincinnati, Ohio.

$1500 will purchase five-ton Couple Gear Electric Truck, recently overhauled and in fine shape. All tires in perfect condition recently applied. KNOWLTON WAREHOUSE CO., Buffalo, N. Y.

FOR SALE—Brush car, in good running order, complete, with top, extra tire and full equipment of tools; at a bargain. Address P. JONAS, 780 Delaware Ave., Milwaukee, Wis.

PLANT FOR SALE CHEAP—Suitable for auto bodies (especially limousine) and accessories. Power, lights, water, dry kilns, sprinklers, sidetracks, abundant storage. A. J. PHILLIPS CO., Fenton, Mich.

TO EXCHANGE—Mitchell Model G and lot in thriving town of Ashdown, Ark., for Buick roadster, 1911 or 1912 model, or other make as good. Address LOCK BOX 583, Pittsfield, Ill.

$400 BUYS, COST $1,000

Atterbury truck, 1912, half ton, panel top, hard tires, chain drive; sold because owner bought larger capacity. DUKE, 57 East 108th St., New York.

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Salesmen now calling on accessory trade can easily double their present income carrying as side line Thomas's Auti-Rim-Rust Paint. Well advertised. Pocket sample. Very liberal commission. One good order per day makes you $100.00 per week. No long sales argument needed. Address G. T. J., 706 Dollar Bank Building, Youngstown, Ohio.

An ad. like this will cost you 90c. for each insertion.

These columns offer you an opportunity to appeal to an audience of 8,000 readers whose merchandising taste is being cultivated

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For Sale—Wants—Exchange

15 cents per line of six words, cash with order. — In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

HOW to time automobile and other gasoline engines, by J. C. GEHRING, Ft. Wayne, Ind. Postpaid, 25c.

LOT in Velasco, Texas, for automobile or motor boat; paid $1,000 20 years ago. TOM CHILDRESS, R. F. D. No. 2, Arlington, Texas.

PEERLESS EXTRA FINE BLACK JAPAN.

For all metal, lamps, radiators, fenders, etc. Air dries in 10 to 12 hours with a high gloss finish. Elastic, tough, durable. No primer; one coat covers solid. Ask your dealer.
The Columbus Varnish Co., Columbus, O.

SALESMAN WANTED by a concern making electrical goods and auto specialties of high grade and strong selling features. To the right man making investment a good interest and good salary will be given. Capital required one to $5,000.00. Rare opportunity. BOX 248, care Motor World.

FORD OWNERS—Our spare demountable wheel cures tire trouble on the road. Attention, Doctors. Write, ANGIER'S, Streator, Ill.

MORA REPAIR PARTS—We have purchased the repair business of the Mora Cars, including all stock on hand, drawings, patterns, jigs, office records and the right to receive the mail of the company. Owners of Mora Cars will save considerable time by placing their orders for parts directly with us. We have in stock repair parts for all models. PHILADELPHIA MACHINE WORKS, 67 Laurel St., Philadelphia, Pa.

AUTOMOBILE CYLINDERS reground, new pistons and rings fitted. Garage air compressors. CAST IRON BRAZING CO., Manchester, N. H.

FOR SALE OR LEASE—The most modern garage in Southern Colorado, with fine repair shop and storage room for sixteen cars, doing good business and fine prospects for coming year. A snap for someone. Address BOX 208, Monte Vista, Colo.

RURAL Parcels Post Delivery Car—Any party with capital and push interested in placing one on the market, correspond with E. P. COWLS, Sparta, Mich.

BROKEN CRANKSHAFTS, cylinders, crankcases, flywheels, gear teeth, pistons, perfectly welded and machined ready to replace. Guaranteed and references Machinery up to 5 tons welded. ATLAS WELDING WORKS, 74-76-78 Irving St., Rahway, N. J.

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ARE YOU in need of any additional help in any department of your business? Are you out of employment or looking for a better connection? Have you second-hand apparatus of any kind or do you want to buy second-hand material. Have you a factory site for sale or do you want to buy one? If so, use the Want and For Sale column of the Motor World. Seven words to the line, fifteen cents a line. Advertisements can be inserted over a number when it is desired and identity of the advertiser will be kept confidential

BROKEN Cylinders and Crankcases—Send them to be made good as new at fraction of replacement cost. Scored cylinder repaired, $12. No new piston and rings required because bore is not enlarged. Where cylinders are worn (not scored from loose wrist pin) reboring is only remedy. We do it expertly. Write for complete information and estimates. WATERBURY WELDING COMPANY, Waterbury, Conn

WANTED—A first-class man to take the agency for the latest invention on the market, a rubber cover for automobile handles called Steerease; write for full particulars. Address DEPARTMENT E, GOODYEAR RUBBER HOSE AND PACKING CO., 221 Chestnut St., Philadelphia, Pa.

KEROSENE FOR AUTOMOBILES.

New Model B uses successfully half and half mixture lowest grades kerosene and gasolene. Satisfaction guaranteed or money refunded. Greatly increased power, very slow speed on high. Starts easy at zero. Special agents' prices. Dept. 8. THE AIR-FRICTION CARBURETOR CO., Dayton, Ohio.

FACTORIES ATTENTION!!!

We are in the market for excess stock of complete cars; chassis; bodies; engines; magnetos; accessories, etc.
PEETS-HOMAN CORPORATION
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CADILLAC 1911.

$675—5-passenger; top, windshield, slip covers, Prest-O, speedometer, extra shoes and tubes; entirely new; any demonstration. DUKE, 57 East 108th St., New York.

AUTO LISTS, owners, etc., of any State. S. H. CARROLL, JR., Albany, N Y

CYLINDERS reground. Pistons fitted. Prompt shipments. HAUBER AUTOMOBILE WORKS, St. Marys, Pa.

DETECTIVES WANTED—Young men wanted to operate in own locality, secret service work, experience unnecessary. Enclose stamp for particulars. UNIVERSAL DETECTIVE AGENCY, 304 Colcord Bldg., Oklahoma City, Okla.

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Have you a troublesome chattel mortgage, bad insurance, or disadvantageous contract, bad debts you want to collect? Do you want to borrow money, or need expert legal advice? I specialize in automobile law. Charges nominal. EDWARD ENDELMAN, Attorney at Law, 299 Broadway, Manhattan, N. Y. C.

weekly to the highest degree by our articles on "Wide Awake Merchandising." Look at the cost as shown in the margins.

An ad. like this will cost you 75c. for each insertion.

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Vitalized Rubber Diamond (No Clinch) Tires

answer your demand for More Mileage



Our chemists have discovered a scientific process of toughening pure rubber.

All types of Diamond Tires are now made of Vitalized Rubber—a flint-like, road-resisting rubber that retains all the young, lusty vigor of the pure gum with no loss of elasticity.

Perfect 3-Point Rim Contact

an additional Diamond advantage

Our Engineers have built up and torn down thousands of experimental tires in an effort to produce a perfectly constructed tire that would give you the "More Mileage" tire you have demanded.



Cross Section of Diamond Safety Tread Tire

In Diamond Tires today each thread of fabric and every ounce of rubber is combined to give the greatest strength and resistance, with no unbalanced strains at unsupported points—*Perfect 3-Point Rim Contact.*

Add to these advantages the No-Pinch Safety Flap for inner tube protection, and, if you wish, the now famous Diamond Safety (Squeegee) Tread and you have absolutely the most satisfying tire money can buy.

Be a Diamond Dealer

If you are not a Diamond Dealer—now is the time to get in line. There is a Diamond Branch near you—get in touch today.

So this time buy Diamond Vitalized Rubber Tires—you can get them to fit your rims at any of the

25,000 Diamond Dealers always at your Service

Only one or two

makers of high-grade cars are waiting

—waiting for their agents and customers to become still *more* insistent that their cars shall be Klaxonized.

The others have met this demand. Here they are. Check the list and see how complete it is.

A. E. C.	**Chicago Electric**	**Lozier**	**Pratt**
Alco	**Church-Field Electric**	**Marmon**	**Schneider** (European)
American	**Cole** (Special)	**Matheson**	**Simplex**
Armleder	**Columbia**	**Metallurgique**	**Staver**
Autocar	**Davis**	**Multiplex**	**Stearns**
H. H. Babcock	**F. I. A. T.**	**National**	**Sternberg**
Bailey Electric	**Flanders**	**Nyberg**	**Stevens-Duryea**
Benz	**Hudson** (Special)	**Oakland**	**Stoddard-Dayton**
Borland Electric	**King**	**Oldsmobile**	**Touraine**
Broc Electric	**Knickerbocker**	**Orson**	**Guy Vaughn**
Buffalo Electric Roadster	**Knox**	**Packard** (Special)	**Walker Electric**
Charon (European)	**Lancia** (European)	**Pierce-Arrow**	**Ward**
		Pope Hartford	**White**

THE Klaxon is the out and out choice of 150,000 motorists. It meets the spirit and intent of all warning signal laws. Not only those of States requiring an "adequate" signal but—more important still—the recent ordinances of Chicago, St. Louis, Los Angeles, Newark, Dallas, and many other cities which rule more specifically against the out-of-date bulb horn by demanding an "abrupt sound, sufficiently loud to be heard under all circumstances."

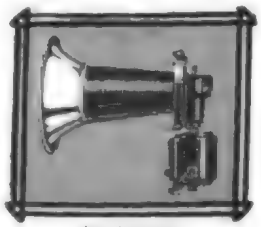


KLAXONET

Lovell-McConnell Mfg Company Newark, N.J., U.S.A.

KLAXON

"The Public Safety Signal"



KLAXON

Marion

The Touring Roadster
A New Marion Model

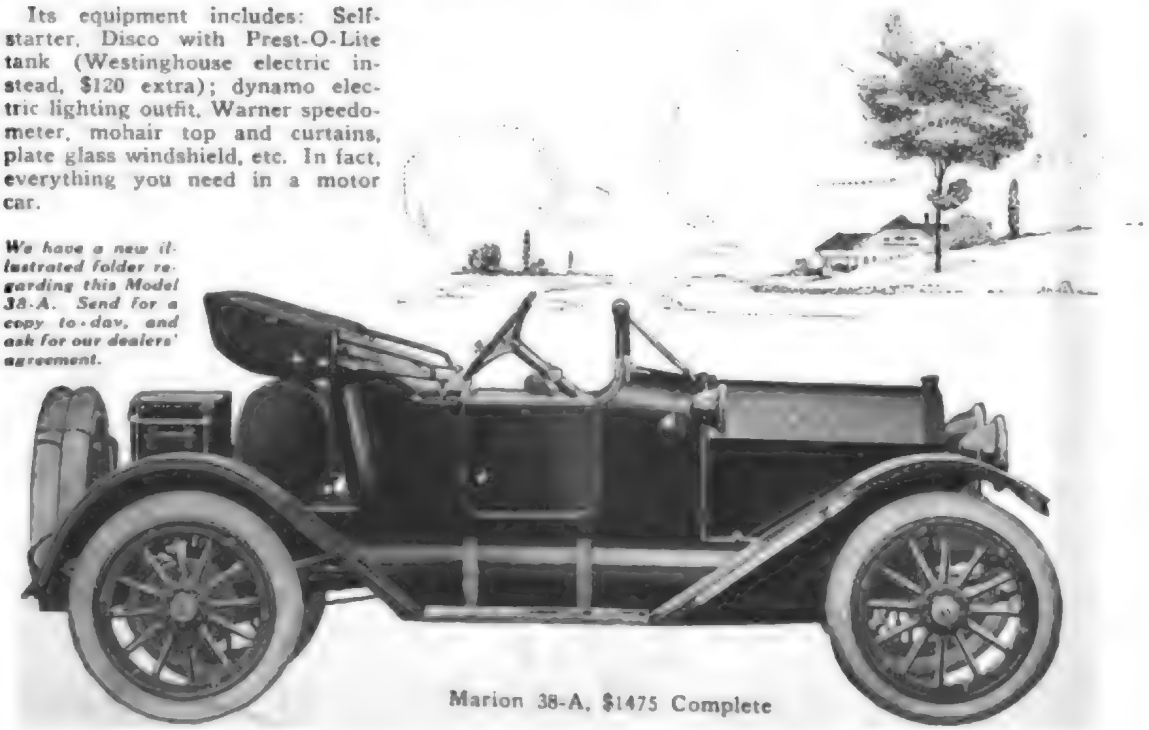
THIS fore-door touring roadster at $1475 is the most advanced type of two-passenger car. It has unusual dignity and class in lines and color—just the car for professional men, business men and women.

It has recently been added to the Marion series to answer a definite demand from motorists wanting a Marion car similar to the famous "Bobcat" with an enclosed body. Since its appearance we have had to double our expected production through press of retail sales.

It has made a hit everywhere. It has the same chassis as the popular 37-A touring car, with quiet and powerful 30-40 h.p. motor; English steel springs; deep upholstering; option of colors—brewster green, deep wine, or cardinal red body with black running gear.

Its equipment includes: Self-starter, Disco with Prest-O-Lite tank (Westinghouse electric instead, $120 extra); dynamo electric lighting outfit, Warner speedometer, mohair top and curtains, plate glass windshield, etc. In fact, everything you need in a motor car.

We have a new illustrated folder regarding this Model 38-A. Send for a copy to-day, and ask for our dealers' agreement.



Marion 38-A, $1475 Complete

The Marion Motor Car Company

918 Oliver Avenue, Indianapolis

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MOTOR WORLD

A Trade Paper Giving the World's Motor News

Vol. XXXIV
No. 13

New York, March 20, 1913

Ten cents a copy
Two dollars a year

What They Say About the GRAY & DAVIS

6-Volt Electric Starter

28 car builders are now using this Starter—these 28 manufacturers indorse this system in the highest terms. Read a few of these opinions—the plain, unvarnished answer to the question—"Which is the *best* Starting device?"

"Absolutely the best that can be had—a starter that has proven itself 100% efficient in thousands of tests."

Paige-Detroit Motor Car Company

"The Gray & Davis Electric Starter and Electric Lighting Dynamo are the best to be had regardless of price."

Pope-Hartford Company

"The most powerful ever used."

Peerless Motor Car Company

"Admitted by authoritative engineers to be without a superior."

Lozier Motor Company

"The National's policy to use nothing but the best, resulted in the adoption of Gray & Davis electric starter and lighting systems."

National Motor Vehicle Company

"The Stearns equipment is absolutely complete. It includes Gray & Davis Electric Lighting and Starting system."

The F. B. Stearns Company

"It appeals to the man who is car wise because it is easily operated and does not complicate ignition."

The Motor Car Mfg. Company

"We have installed your electric starter on our Maritime 'Six' with extremely satisfactory results, and are satisfied that we made the wisest choice possible."

The Maritime Motor Car Co., Ltd.

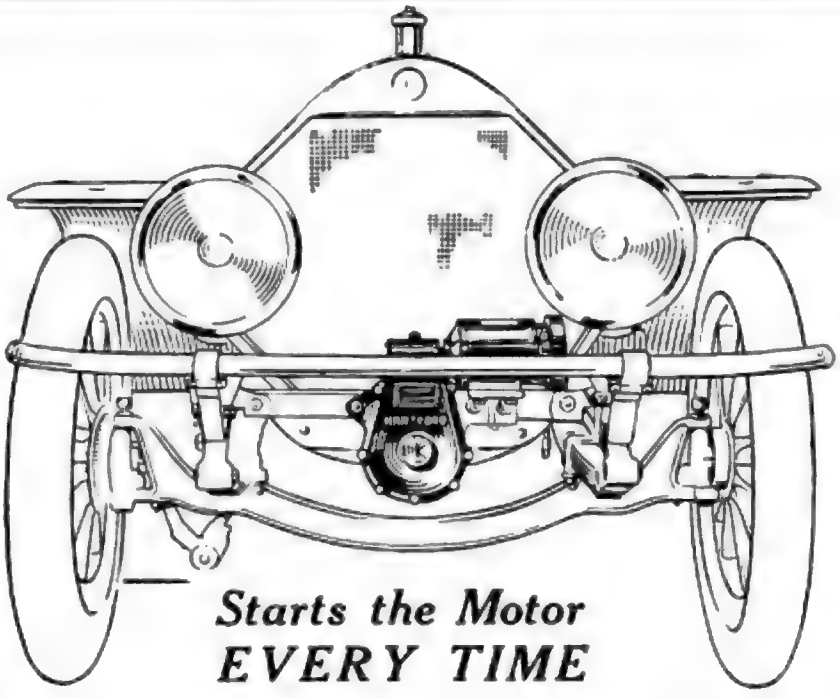
"The most noticeable advancement for 1913 season is the adoption of the Gray & Davis Electric Starter."

Velie Motor Vehicle Company

Write for Information

GRAY & DAVIS, Inc., 55 Lansdowne St., BOSTON, MASS.
Manufacturers of Automobile Lamps, Dynamos and Electric Starters

Published Weekly by the Motor World Publishing Company, 1600 Broadway, New York



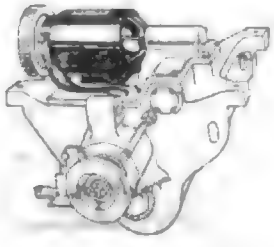
Starts the Motor EVERY TIME

Starts the biggest motor with a press of the button—starts it unfailingly, positively every time. Yet the

HARTFORD ELECTRIC
Starting and Lighting
SYSTEM

is the smallest and lightest ever devised. Invented by Mr. Edw. V. Hartford three years ago, it has been simplified to the extent of six compact, light weight parts that make it the only system applicable successfully to **any** car, old or new. Most powerful motor invented utilizes a flywheel on its armature shaft—spins a 90 H. P. engine at 118 revolutions a minute. Most efficient generator invented—produces most power in proportion to size. Smallest battery equipment for a starter—six cells and adequate current constantly on hand for starter and lights.

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Hartford Starter built into transmission of new car

HARTFORD SUSPENSION CO.

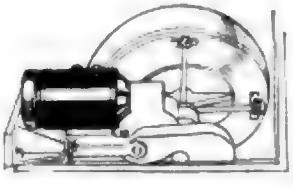
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Manufacturers of

Hartford Self-Starters, Shock Absorbers, Jacks and Bumpers

Office and Works: Jersey City, N. J.

Branch Offices and Dealers Everywhere



Hartford Starter back of clutch collar on new cars

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For Easiest Riding. Because a rubber has been perfected and a shape designed for these tires which afford the buoyancy of air.

For Greatest Economy. Most miles per battery charge. Extra resiliency gives extra traction and dual tread cuts down road friction.

Also Most Miles Per Dollar for tires. The superior toughness of Firestone rubber and a design which allows the tire to wear to the rim will save you many dollars.

Firestone tires never *give out when half worn*, because it is not necessary to weaken them in order to obtain resiliency. The easy ride is in the rubber.

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The Firestone Tire & Rubber Co.

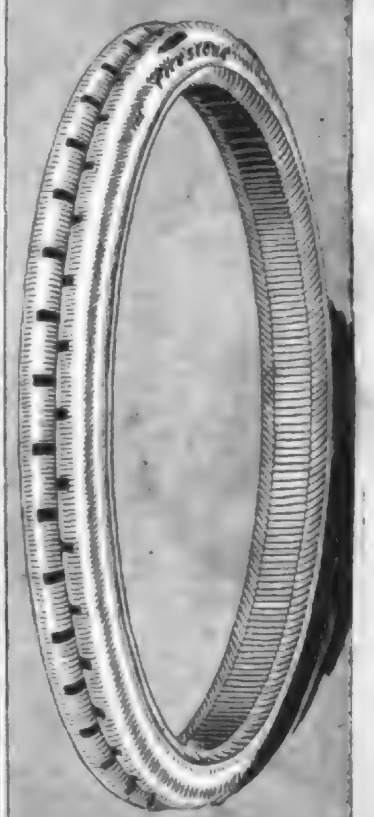
"America's Largest Exclusive Tire and Rim Makers"

Akron, Ohio

Branches, Agencies and Service Stations Everywhere



Most Miles Per Battery Charge



Uniform Resiliency

The Ride Supreme



The Machinist—
Get *His* Tool-Trade!



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"The tools that are guaranteed"

Not only satisfy the machinist, but surpass his expectations by giving him B. & S. Tools.

For convenience, strength, workmanship and durability the triangle trademarked tools have been the standard over 40 years.

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¶ Is made from Pennsylvania crude.

¶ Pennsylvania crude sells at from 2 to 3 times as much as other crudes on account of its higher lubricating value. Surely then the oil made from Pennsylvania crude is unquestionably better than others.

¶ Remember this when you are thinking of what line of oils to carry in stock.

NEW YORK LUBRICATING OIL CO.
Consolidated with
Columbia Lubricants Co. of N. Y.
116 Broad Street, New York City

BRANCHES AT NEWARK, BOSTON, CHICAGO, CLEVELAND, PHILADELPHIA, SEATTLE, SAN FRANCISCO, LOS ANGELES, SPOKANE, LONDON, ENGLAND; JOHANNESBURG, SO. AFRICA

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$985

F. O. B. Toledo

Completely Equipped

Self-Starter
10 Horsepower
5-Passenger Touring Car
110 inch Wheel Base
Timken Bearings
Center Control

Overland

$985

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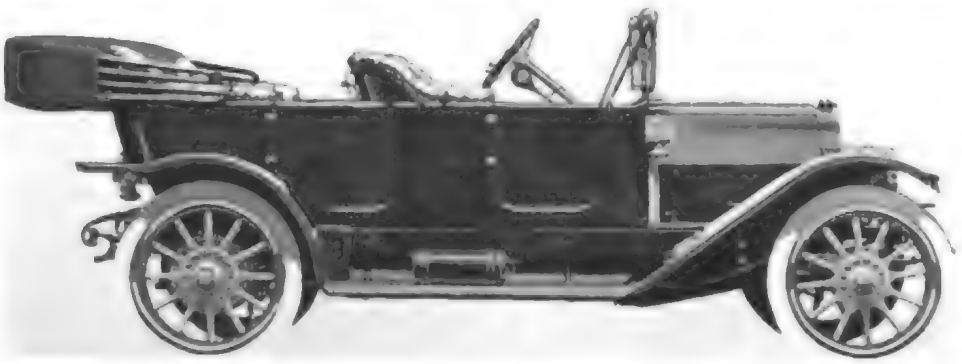
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Remy Magneto
Warner Speedometer
Mohair Top and Boot
Clear Vision, Rain Vision
Windshield
Prest-O-Lite Tank

THIS year we will sell 40,000 Overlands. We sold 400 in 1908; 4,000 in 1909; 15,000 in 1910; 15,000 in 1911; 28,000 in 1912. Year after year Overland sales grew until they now reach the 100,000 car mark; year after year Overland value has increased. Our prices have steadily decreased as our production cost has been lowered. Elsewhere you must pay $1200 for a similar car.

Catalog on request. Please address Dept. 50

The Willys-Overland Co., Toledo, Ohio



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MOTOR WORLD

Vol XXXIV | New York, U. S. A., Thursday, March 20, 1913 | No. 13

BERGDOLL CHARGED WITH MAKING "FAMILY" PAYMENTS

Creditors File Bankruptcy Petition After Sheriff Had Levied on Factory—Bergdoll Millions Not to the Rescue.

Although popularly supposed to have behind it the millions of Bergdoll wealth, a petition in bankruptcy against the Louis J. Bergdoll Motor Co., of Philadelphia, Pa., was filed on Monday last, 17th inst., the petitioning creditors alleging, among other things, that within the last 30 days the company had made preferential payments, all of a family nature. According to the complaint, these payments amounted to $33,120, as follows: $31,220 to Erwin R. Bergdoll, $400 to the C. A. Bergdoll Coal Co. and $1,500 to the North Broad Street Realty Co., in which the Bergdoll family is also interested.

The petitioning creditors and the amounts of their claims are as follows: W. C. Rhodes, Inc., $1,696.85; Chilton Co., $505; Castle Lamp Co., $1,772.85.

The first rumbling in the affairs of the Louis J. Bergdoll Co. were heard last summer, when the Westinghouse Machine Co. brought suit and obtained judgment for $104,000 for breach of contract, the Bergdoll interests having repudiated a contract for 1,000 motors after 600 of them had been delivered. The suit, however, was settled satisfactorily after the judgment had been entered. But a minor creditor precipitated matters last week by suing out a writ of execution on a claim of $1,500 and before the execution was satisfied Frank Fanning, at one time the Bergdoll sales manager, levied on the available funds. Seizure of the contents of the Bergdoll factory was made by the sheriff, a notice of the levy and sale having been posted on Monday last. The filing of the bankruptcy petition followed soon after.

While the Bergdoll car acquired a reputation, it really never cut a very large figure in the industry, but the wealth and prominence of the Philadelphia Bergdolls, who operate an immense brewery and are large property owners, served to give it quick financial standing which was assisted by the reputation which at least two of the Bergdoll boys had achieved in road racing.

The Louis J. Bergdoll Motor Co. itself was capitalized at $300,000, the principal stockholders beng the four Bergdoll brothers—Louis J., Erwin R., P. A., and Grover Cleveland Bergdoll, the latter of whom has had trouble of his own.

Fort Wayne Negotiating with Salisbury.

If Fort Wayne (Ind.) will subscribe for $300,000 worth of stock in a new million dollar company which will be organized under the laws of Indiana, the Salisbury Wheel & Mfg. Co., of Jamestown, N. Y., will pull up stakes and re-establish itself in the Indiana city. The proposal was made last week at a mass meeting of the business men of Fort Wayne, who took the offer under advisement pending a visit of an investigating committee to the Jamestown plant. In addition to the latter, the Salisbury company operates factories in Greenville, Pa., and Peru, Ind., and if the deal goes through all of them will be consolidated at Fort Wayne.

Stewart Retires from Active Service.

J. K. Stewart, of the Stewart-Warner Speedometer Corporation and the J. K. Stewart Mfg. Co. of Chicago, has retired from active participation in the affairs of both of those concerns. He, however, will retain his holdings and will be directly represented by C. B. Smith, the treasurer and general manager of the Stewart-Warner corporation. Nels Gross, the Eastern sales manager of the latter company, has relinquished that office and removed to Chicago, where he has become sales manager of the J. K. Stewart Mfg. Co., which produces die castings, and out of which the Stewart speedometer business originally grew.

ENTIRE INDUSTRY IS UNITED IN CHAMBER OF COMMERCE

Merger of N. A. A. M. and Board of Trade Formally Consummated—Clifton First President—Broad Charter Obtained.

The Automobile Chamber of Commerce is in being and Charles Clifton, of the Pierce-Arrow company, is its first president. On Monday last, 17th inst., its certificate filed under the membership corporation law of New York was approved by the Supreme Court, and yesterday (Wednesday) it was formally organized with Clifton, nine-time president of the Association of Licensed Automobile Manufacturers and the Automobile Board of Trade, as its head.

The other officers chosen were: Vice-president, W. C. Leland (Cadillac); secretary, R. D. Chapin (Hudson); treasurer, George Pope (Pope).

There are 14 directors, comprising the president, vice-president and secretary, but not the treasurer, and the following: C. C. Hanch (Marmon), Hugh Chalmers (Chalmers), Sidney D. Waldron (Packard), Samuel T. Davis, Jr. (Locomobile), Windsor T. White (White), William E. Metzger (Flanders), H. O. Smith (Premier), Albert L. Pope (Pope), George W. Bennett (Overland), L. H. Kittredge (Peerless), and H. H. Rice (Waverley).

They will hold office until June 4, 1914. Thereafter the annual meetings will occur on the first Thursday after the first Wednesday in June.

In the strictest sense the Chamber of Commerce is a new and distinct organization; in the trade sense it represents the long-pending merger of the Automobile Board of Trade and the National Association of Automobile Manufacturers, both of which will now proceed to go out of existence, leaving the Chamber as their successor. Practically they are as good as dead, but legally they will remain alive until their

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affairs are wound up, which will be done gradually and will not be completed for several months.

The welding of the N. A. A. M. and the Board of Trade into the Chamber of Commerce represents the first time that the industry has been united since the day the Selden patent and the Association of Licensed Automobile Manufacturers, which was built around it, appeared on the scene. Soon after Henry Ford smashed the famous patent two years ago and made the A. L. A. M. a misnomer and required that it become the Automobile Board of Trade, sentiment was freely voiced that the time had arrived when there no longer was room for two national trade organizations, both working along the same lines, but it was William E. Metzger, president of the N. A. A. M., who first arose in open meeting and expressed official belief to that effect. Thereafter events moved gradually, and a year ago, after Metger had been re-elected, his expressed opinion took form in the shape of the appointment of conference committees by both organiations looking toward consolidation. They encountered more small stumbling blocks than was anticipated, and it was not until about three months ago that the last of the obstacles was removed, despite the fact that practically all members of the Board of Trade were also members of the N. A. A. M. and that the two associations occupied adjoining offices in New York and the dividing line was otherwise not very deeply or distinctly marked.

In the distribution of officers incident to the formation of the Chamber of Commerce, the Board of Trade received the presidency and treasurership and the N. A. A. M. the vice-presidency and secretaryship, although in each case the officers were members of the board of one organization or the other.

The scope of the Chamber of Commerce, whose corporate life is fixed at 25 years, is wide, its charter defining its objects as follows:

The particular objects for which the corporation is to be created are:

To foster the interests of those engaged in the trade or business of manufacturing automobiles and all other self-propelling vehicles;

To reform abuses relative thereto;

To secure freedom of its members from unjust or unlawful exactions;

To diffuse accurate and reliable information as to the standing of merchants and others dealing with members, as to all inventions, patents, processes or devices designed or intended for use in, upon, or in connection with such vehicles and the manufacture thereof, as to the state of the art relative thereto, and as to the condition and development of the trade in which the members are engaged, in the United States and foreign countries;

To procure uniformity and certainty in the customs and usages of such trade;

To promote the construction of better highways;

To advocate the enactment of just and equitable laws affecting members;

To settle differences between members;

To promote a more enlarged and friendly intercourse among business men engaged in such trade or dealing with persons engaged therein;

To acquire by grant, gift, purchase, devise or bequest, to hold and to dispose of such property as the purposes of the corporation shall require, subject to such limitations as may be prescribed by law, including inventions, letters patent and processes, or rights thereunder, for the benefit of its members and not for pecuniary profit.

Woman Dealer Gets Her Money Back.

One hundred and twenty-eight dollars which Mrs. Emma Thies, of Aurora, Ill., deposited as a forfeit when she signed up as a dealer for the W. H. McIntyre Co., of Auburn, Ind., were ordered returned to her last week by the Municipal Court in Chicago, where she sued the automobile manufacturing concern for the sum; after taking the agency she sold one car and then broke the contract, demanding her money back, which was refused. The transaction occurred a year ago, but suit was not brought until the recent Chicago show, when she attached one of the cars exhibited by the company. A counterclaim of $2,000, entered by the company, was withdrawn.

Benjamin Becomes Alco Sales Manager.

C. Arthur Benjamin, of Syracuse, N. Y., has been appointed general sales manager of the American Locomotive Co.'s automobile department and already has assumed the duties. He succeeds to the vacancy caused by the resignation of Harry S. Houpt. Benjamin, who is one of the oldest and best known dealers in central New York, where he handles Packards and Hudsons, will retain his interest there, having placed a manager in charge of his Syracuse establishment. Benjamin is no stranger to sales managers' duties, however, having served twice previously in that capacity.

Republic Quits Grant Patent Fight.

Although the Republic Rubber Co. of New York kept up its fight in the United States District Court for the Southern District of New York against the Consolidated Rubber Tire Co. in the latter's suit for infringement of the Grant imbedded-wire solid tire patent, No. 554,675, the Republic company surrendered last week in the midst of the suit and a decree was ordered in favor of the Consolidated. The Republic company had cross-examined the Consolidated's witnesses in court and so conducted itself that it was believed it would fight the case to a finish, but when it came time for it to produce witnesses and show its defense it decided otherwise.

Its decision was influenced by the decision of a similar suit against the Republic Rubber Co., of Youngstown, O., in the Federal courts in Chicago, where the matter was thrown out of the District Court by Judge Kohlsaat but was won by the Consolidated when an appeal was taken to the Circuit Court of Appeals. The suit in New York was practically the same as the one in Chicago, and with failure in the Western litigation the Republic company had comparatively little hope of success in New York. The decree directs an injunction and an accounting of the profits made by the New York Republic agency through the sale of the tires which infringe.

Maxwell Declares Branch Bankrupt.

By order of its board of directors(a petition in bankruptcy yesterday (Wednesday) was filed against the Stoddard Motor Co., 5 West 61st street, New York City. Its stated liabilities amount to $253,238, all of which is due the Maxwell Motor Co., which owns the Stoddard company. H. M. Bronner, former manager of the Stoddard branch, also has a claim against the company, which is not listed as a liability as the amount is unknown. It is understood to be about $30,000, and to cover an amount due for salary on a disputed or broken contract.

The assets, amounting to $66,988, are made up as follows: Parts and accessories, $34,302; office furniture, $2,439; garage tools, $2,304; good accounts, $12,404; cash in bank, $15,499, and cash on hand, $140.

Originally the Stoddard company was a branch of the United States Motor Co. and handled Stoddard-Dayton cars. When the United States Motor assets were taken over by the Maxwell Motor Co., the Stoddard branch, of course, went with them, but as it never had been a money maker the petition in bankruptcy was filed as being the most expeditious method of winding it up.

Charles G. Stoddard was president of the branch until March, 1912. Latterly W. M. Anthony, comptroller of the Maxwell Motor Co., has been serving in that capacity.

Courtney Tire Indebted for Tires.

Several judgments were taken above five months ago against the Courtney Tire & Rubber Co., of New York City, and its principal, William J. Courtney, were added to this week when the Ajax-Grieb Rubber Co. filed a judgment in the New York county clerks' office for $51.44. The suit was brought in the Municipal Court.

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ONLY ATTACKS OWN AGENCY CONTRACT TO FREE FACTORY

Remarkable Point Raised in Action Due to Factory's Attachment—But Court Heeds It Not and Only Loses.

Unusual in that its procedure was an attack upon itself and its own dealership contract, the Only Motor Car Co., of Port Jefferson, N. Y., when arguing an appeal in the Appellate Division of the Supreme Court in New York City last week, offered as a part of its defense that the contract upon which Dudley H. Cohen asks $14,244 is invalid and in restraint of trade in that it fixes the retail price at which the cars are to be sold; "restraint of trade" is a term which has been much bandied about since prosecutions were inaugurated under the Sherman anti-trust law and the "fixed retail price" feature is the point about which many legal battles have been waged, but heretofore manufacturers who entered into contracts have been at great pains to show that their agreements were not of that variety.

The attorneys for Cohen, who signed up as New Jersey distributer but who claims he failed to get any cars, were somewhat surprised when the Only attorney introduced the restraint of trade idea, naturally not expecting that the manufacturing company would thus attack its own contract, and quite as naturally the argument that such a defense was untenable and should not be considered and their viewpoint apparently was in accord with that of the court for decision was rendered in favor of Cohen without discussion of the novel point. The Only attorney, after the conclusion of the argument, said he and his client were curious to know the status of this form of dealership contract, which is common in the trade, and therefore had decided to give the court an opportunity to discuss it, should the judges desire so to do.

Cohen, who claims he could have made profits on the 200 cars he contracted for and who states that he paid $1,000 for a demonstrating car which he has failed to get and therefore asks the $12,244, secured an attachment upon the Only factory several weeks ago in the Supreme Court for New York county, and the appeal by the Only company was from an order denying its motion to vacate the attachment.

The company, aside from the restraint of trade allegation, contended that Cohen had failed to show that he was able to take the first instalment of 16 cars had they been offered to him, that the contract is executory, that he had not adopted the correct rule for the ascertainment of damages, and that he has no cause for action. Cohen, in opposing these arguments, claimed the attachment should not be vacated unless the Only company was able to show that Cohen's suit would surely fail, and also alleged that the Only company, and not he, had broken the contract. While two of the judges declared that Cohen had no cause for action, the majority held that the attachment should remain in effect.

The contract specified net prices of $1,000 for touring cars and $800 for runabouts and retail prices of $1,250 and $1,000, respectively, the contract to run for a year from October, 1912, and the cars to be delivered in monthly instalments. The company also states that the contracts were incorrect in that the delivery of cars was to have begun before the delivery of the demonstrator.

Kansas City Dealer Sues Maxwell.

Alleging that it has been damaged to the extent of $80,000, the Bond Motor Co., of Kansas City, Mo., has brought suit in that city against the Maxwell Motor Co. of Detroit. Originally the Bond company had the agency for the Everitt car, and when the Everitt was absorbed by the Flanders Motor Co. the agency contract was renewed. When the Flanders, however, was taken over by the new Maxwell Motor Co., the latter set up its own establishment in Kansas City and proceeded to sell Maxwell cars, which sales, according to the Bond complaint, caused the amount of damage prayed for.

Commer Truck With Three Millions.

The Commer Truck Co. of America, capitalized at $3,000,000, has been incorporated under the laws of Delaware to continue the manufacture of Commer trucks in this country, which was interrupted by the failure of Wyckoff, Church & Partridge, who previously held the American rights. The personnel and plans of the Commer company, however, are not yet public property. The only men whose names have become known are those of the three incorporators: J. F. Curtin and H. O. Coughlan, of New York, and J. M. Satterfield, of Dover, Del.

Refinancing Grand Rapids Truck.

Refinancing of the Grand Rapids Motor Truck Co., which only recently located in that Michigan city after removal from Decatur, Ind., has been found necessary. In order to obtain the needed capital, holders of the $154,000 outstanding preferred stock have been asked to exchange their certificates for common stock and also have been requested to vote for an additional issue of $100,000 7 per cent. preferred, the latter to carry a bonus of 50 per cent. common stock.

TEXAS MAN, SORRY HE SOLD, SUES TO REGAIN COLE STOCK

Alleges He Was Induced to Sell Out Just Before Dividends Began to Grow—Asks Court to Rescind Agreement.

Lee Watson, a Texan, who when the Cole Motor Car Co., of Indianapolis, was organized acquired 165 shares of its stock, and who later sold it at a profit of $1,000, has repented of his folly, now that the Cole company has grown fine and large and waxed prosperous. He, therefore, desires to share the prosperity, and his effort to do so has taken the form of the institution of a suit in the Superior Court of Indianapolis asking that his sale of his stock be rescinded. In addition to the Cole company itself, Watson names as defendants Joseph J. Cole, J. Frank Morrison and Samuel J. Kuqua, who are officers of the company.

In his complaint, the Texan sets forth that when the Cole Motor Car Co. was incorporated in 1909, with an authorized capital of $100,000, he acquired the 165 shares of which he now is anxious to regain possession. Later, he alleges that Cole, Morrison and Kuqua, representing that the future of the company was uncertain and that the stock was worth no more, offered him 75 cents on the dollar, or about $12,000. Watson, however, held out and finally sold the stock to the Cole officials for $17,500, or $1,000 more than its par value.

When this transaction was consummated, Watson charges that instead of the future of the company being uncertain, the defendants were well aware that it shortly would declare a dividend of 30 per cent., of which, however, they said nothing to him. He also declares that 91 shares of the stock which remained in the treasury were distributed among Cole, Morrison and Kuqua.

Accordingly he asks the court to rescind the sale, agreeing to pay the company whatever amount the court decides he should pay for the 165 shares he formerly owned. He also sets up a claim for the amount of dividends he would have obtained had he retained his stock.

Wants Another Receiver for Clark.

The Clark Motor Car Co., of Shelbyville, Ind., which emerged from the hands of a receiver only a few months ago, is again in trouble. A creditor, whose claim amounts to $329.50, last week asked for the appointment of another receiver and also that the Clark property, which is not very extensive, he sold to satisfy the claim. The court granted the petition on March 18, naming Herbert Jones as receiver.

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S. A. E. COUNCIL INDORSES A. L. A. M. RATING FORMULA

Formal Recognition Made in Resolutions Designed to Strengthen New Jersey Clubs' Position—Stroke Remains Ignored Factor.

Hopes that the Society of Automobile Engineers would realize the illogic and fallacy of the A. L. A. M. horsepower formula, which takes account of bore only, and would evolve a new method of rating wherein stroke would be permitted to cut a figure, have proved vain. Instead, the Council of the Society has gone on record as indorsing the A. L. A. M. method of rating.

Due to the situation which developed in New Jersey, where the commissioner of motor vehicles sought to have the legislature empower him to evolve his own rating, and to change it at will, and where at least two automobile organizations locked horns over the A. L. A. M. rating, the Society of Automobile Engineers was appealed to for assistance which, it came out only this week, was rendered at a meeting of the Council on February 19th last. At that time, the Council indorsed the A. L. A. M. rating by passing the following resolutions:

"Whereas, The A. L. A. M. horsepower formula was in May, 1907, adopted by the Association of Licensed Automobile Manufacturers, after the recommendation of its mechanical branch, the said recommendation being based upon the almost unanimous opinion of the association engineers after full consideration, the subject having been approached by determining what, in the light of the concensus of opinion as to good practice was a fair piston speed to assume, and the piston speed then formally adopted having been one thousand feet per minute; and,

"Whereas, The average view of the A. L. A. M. engineers as to a proper motor rating at the assumed piston speed was so nearly in accord with the formula heretofore adopted by the Royal Automobile Club of England, it was decided to adopt this formula; and,

"Whereas, Although the piston speed is not an element of the formula itself, the formula is based on one thousand feet per minute piston speed, it being assumed that the motor with the shorter stroke will make a greater number of revolutions per minute, and the one with the longer stroke a fewer number of revolutions per minute, relatively; and,

"Whereas, For the purpose of a general rating formula an approximation will suffice, and is indeed the only thing possible owing to the many variable factors which affect the power developed by any engine; it is

"Resolved, That the A. L. A. M. horsepower formula is as good a formula as can be devised for general purposes and meets all practical needs in rating gasolene automobile motors in the determination of registration-taxation, power developed when traveling on the road, comparison of engine performances by the public, etc."

TO PRODUCE UNDERSLUNG TRUCKS IN CALIFORNIA

Million Dollar Company Formed for the Purpose in Los Angeles—Double Worm Drive and Another Radical Feature.

For the purpose of manufacturing underslung trucks up to 20 tons capacity, the Los Angeles Motor Truck Mfg. Co. has been incorporated under the laws of California with an authorized capital of $1,000,000. A factory site has been secured at Bangle, near Dominguez, and architects are said to be at work on building plans. W. B Joslyn is general manager of the company and M. S. Walton chief engineer.

The truck which will be produced is radical in that it is not only of the underslung type, but that it employs double worm drive to each rear wheel. The underslung construction permits the loading platform of the truck to be brought within 21 inches of the ground, which is expected greatly to facilitate the handling of heavy goods.

The double worm drive comprises worm gears at each end of the jackshaft, which is just behind the seat and transmits the power of the engine to drive shafts which follow closely and are protected by the channel steel frame of the bed and convey the power to each rear wheel by means of another worm and worm wheel, the latter being an integral part of the hub. The drive shafts have universal joints at both ends.

Hupp's Monarch Becomes Tribune.

Because of a prior claim to the name Monarch Motor Car Co., which he first selected, Louis G. Hupp, former secretary of the R. C. H. Corporation, has changed the style of his project to Tribune Motor Co., and has acquired factory facilities at 807-815 Scotten avenue, Detroit. The Tribune "30," as it will be styled, is a well standardized car which will list at about $1,250, the price not having been definitely settled. L. G. Hupp is president of the company and H. C. Limbach chief engineer, the names of their associates not having been made public.

BATAVIA CHARGES SEAMLESS WITH IMITATING ITS TREAD

Declares Unfair Competition in Likeness of "Safety" to "Security" Designs—Sues for Injunction and Accounting.

When the Batavia Rubber Co., of Batavia, N. Y., announced at the time of the New York automobile show that it would sue alleged imitators of its "Security" tread unless imitation ceased, it apparently was more than "bluffing," for suit was filed this week in the United States District Court for the Southern District of New York against the Seamless Rubber Co., of New Haven, Conn., alleging unfair competition and demanding an injunction and an accounting of damages.

The suit is more or less of an innovation in automobile trade litigation, for with such a multiplicity of tread designs there is often a similarity, and an unpatented tread design has not heretofore been considered as a worthy basis of a suit. The Batavia company, however, believes otherwise, and in its "warning" issued in January classed as imitators the Seamless Rubber Co., Kelly-Racine Rubber Co., of Racine, Wis.; United & Globe Rubber Cos., of Trenton, N. J., Stein Laplock Tire Co., of New York City, and the C. H. Stoddard Rubber Tire Works of Worcester, Mass. No suits have as yet been filed against the last four concerns mentioned.

The Seamless company's "Safety" tread is claimed to be an imitation of the "Security" to such an extent that the trade has been deceived and much profit has been diverted from the Batavia company; the "Safety" tread tire is alleged to be inferior in workmanship, quailty and wearing ability. The goodwill of the "Security" tread, which has been manufactured for from three to five years, is estimated at $25,000, and it is "believed" by the Batavia company that the Seamless company has received profits of $10,000 which should have gone to the New York State rubber workers. The "Security" tread tires are said to constitute 85 per cent. of the Batavia's business. Both treads consist of "cuts" at an angle to the center line of the tread.

Telephones and Tires Trouble Essenkay.

The Essenkay Sales Co., of New York City, is the debtor in a judgment filed this week in the New York county clerk's office by the New York Telephone Co. The amount is $37.84 and represents telephone rental. Another judgment, amounting to $40.08, was filed against it by the United States Tire Co.

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The Week's Incorporations

Carroll, Ia.—Swaney Automobile Co., under Iowa laws; authorized capital, $50,000; to deal in motor cars.

Altoona, Pa.—General Motor Car Co., under Pennsylvania laws; authorized capital, $10,000; to deal in motor cars.

Mt. Pleasant, S. C.—Arby Automobile Co., under South Carolina laws; authorized capital, $200,000; to deal in motor cars.

Victoria, Tex.—Park Garage Co., under Texas laws; authorized capital, $10,000; to operate a garage. Corporators—John Frazer, J. T. Linebaugh, W. H. Crane.

Bedford, Ind.—Bedford Motor Bus Co., under Indiana laws; authorized capital, $10,000; to operate motor buses. Corporators—M. Wallner, A. E. Smith, C. K. Brock.

Moline, Ill.—Ohio-Moline Plow Co., under Illinois laws; authorized capital, $50,000; to deal in motor cars. Corporators—L. C. Blanding, J. C. Irving, G. A. Bannister.

Little Rock, Ark.—Paige-Detroit Co., under Arkansas laws; authorized capital, $10,000; to deal in motor cars. Corporators—J. C. Jones, William Rankin, W. M. Lewis.

Chicago, Ill.—United Rubber Tire Co., under Illinois laws; authorized capital, $1,000; to deal in motor car tires. Corporators—F. M. Hutchinson, W. W. Coe, Jr., A. W. Smith.

Marion, Ohio—Automatic Puncture Stop Co., under Ohio laws; authorized capital, $10,000; to manufacture tire sealers. Corporators—C. E. Merkle, M. McKinsey, F. C. Smith.

Chicago, Ill.—I. & W. Mfg. Co., under Illinois laws; authorized capital, $1,000; to manufacture motor car devices. Corporators—A. L. Currey, G. W. McIntyre, F. W. Nelson.

Milwaukee, Wis.—Creek Motor Sales Co., under Wisconsin laws; authorized capital, $25,000; to deal in motor cars. Corporators—R. C. Creek, Nora M. Creek, Willett M. Spooner.

Ravenna, Ohio—Ravenna Motor Truck Co., under Ohio laws; authorized capital, $200,000; to deal in motor trucks. Corporators—W. M. Traves, A. H. Knuth, H. Schwartz.

Muncie, Ind.—Derrickson Mfg. Co., under Indiana laws; authorized capital, $125,000; to manufacture motor car devices. Corporators—Harry S. Osborn, H. L. Kitselman, R. C. White.

St. Louis, Mo.—John Berry Automobile Co., under Missouri laws; authorized capital, $20,000; to deal in motor cars. Corporators—John Berry, Albert Bommer, Louis J. Koenigstein.

Spokane, Wash.—Harry L. Olive Co., under Washington laws; authorized capital, $2,000,000; to manufacture motor cars and supplies. Corporators—Harry L. Olive, Arthur J. West.

Waltham, Mass.—W. M. Caldwell Co., under Massachusetts laws; authorized capital, $5,000; to deal in motor cars. Corporators—William M. Caldwell, Fred Jordan, Thomas F. Carey.

Wilmington, Del.—Dreadnaught Tire & Rubber Co., under Delaware laws; authorized capital, $1,000,000; to manufacture tires, etc. Corporators—F. D. Buck, G. W. Dillman, B. M. Crawl.

Danbury, Conn.—Danbury Garage Co., under Connecticut laws; authorized capital, $10,000; to operate a garage. Corporators—Samuel M. Parmelee, Herbert A. Lake, Robert J. Congalton.

Oklahoma City, Okla.—Severin Tire & Supply Co., under Oklahoma laws; authorized capital, $10,000; to deal in motor car tires. Corporators—A. L. Severin, L. H. Severin, J. H. Eagan.

Rochester, N. Y.—Stein Auto Supply Co., under New York laws; authorized capital, $3,000; to deal in motor car supplies. Corporators—Anrrew E. Stein, Harry E. Pramer, Louise M. Stein.

Syracuse, N. Y.—Atlas Die Casting Co., under New York laws; authorized capital, $10,000; to manufacture die castings. Corporators—F. R. Holmes, Morey R. Smith, Simon B. Schlachter.

Canton, Ohio—Harper Tire & Rubber Co., under Ohio laws; authorized capital, $100,000; to manufacture motor car tires. Corporators—Warren D. Harper, James Thomas, Albert H. Vayo.

New York, N. Y.—Commer Truck Co. of America, under Delaware laws; authorized capital, $3,000,000; to manufacture motor trucks. Corporators—J. F. Curtin, H. O. Coughlan, J. M. Satterfield.

Cleveland, Ohio—Cleveland Speed Indicator Co., under Ohio laws; authorized capital, $10,000; to manufacture motor car devices. Corporators—Arthur Friedman, Leo Friedman, O. F. Friedman.

South Orange, N. J.—New York Simplex Auto School, under New Jersey laws; authorized capital, $25,000; to operate a correspondence school. Corporators—T. P. Ward, H. L. Smith, R. W. Hollman.

Indianapolis, Ind.—Lindsay Auto Parts Co., under Indiana laws; authorized capital, $250,000; to manufacture motor car parts. Corporators—Mahlon E. Bash, Matt W. Lowder, Joseph T. Head.

Rochester, N. Y.—Carthage Auto Co., Inc., under New York laws; authorized capital, $5,000; to deal in motor cars. Corporators—Arthur W. Alderman, Charles L. Pierce, Frederick A. Kuhnert.

Kingston, N. Y.—Brown Auto Supply Co., Inc., under New York laws; authorized capital, $7,000; to deal in motor car supplies. Corporators—Emerson Brown, Lewis Brown, Rodney B. Osterhoudt.

Yonkers, N. Y.—Broadway Auto Supply Co., Inc., under New York laws; authorized capital, $5,000; to deal in motor car supplies. Corporators—Frederick J. Snyder, Pauline A. Snyder, Bernard E. Reardon.

Rochester, N. Y.—Rochester Automobile Exchange, Inc., under New York laws; authorized capital, $500; to deal in motor cars. Corporators—Bertram E. Wilson, W. Hayes Mitchell, Owen D. Dewitt.

New York, N. Y.—Tioma Oil & Grease Co., Inc., under New York laws; authorized capital, $50,000; to deal in lubricants. Corporators—E. J. Forhan, F. B. Knowlton, J. J. Harper, all of 154 Nassau street.

Indianapolis, Ind.—Hampton Mfg. Co., under Indiana laws; authorized capital, $35,000; to manufacture motor car devices. Corporators—S. B. Nussbaum, Sol. Allman, M. Moskin, W. F. Hadley, Sam Rubens.

New York, N. Y.—Forty-Seventh Street Taxicab Co., Inc., under New York laws; authorized capital, $500; to operate taxicabs. Corporators—Thomas G. Garvan, J. E. Garvan, J. P. Garvan, 124 West 54th street.

Chicago, Ill.—Auto Commission Mfg. Co., under Illinois laws; authorized capital, $50,000; to manufacture motor car supplies. Corporators—Harry M. Snow, George W. Nevins, F. W. Robinson, Wm. J. Liddy.

Chicago, Ill.—Peterson Motor Car & Garage Co., under Illinois laws; authorized capital, $5,000; to deal in motor cars and operate a garage. Corporators—Monroe T. Peterson, Nels H. Linquist, William D. Petzel

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SEGALL'S $4,000 TRIMMED DOWN TO 6 CENTS BY JURY

Jury Admits He's Right But That's About All He Gets—Top Maker Sues on Deal That Brooklyn Dealer Supposed Settled.

The $4,195.85 which Solomon Segall, trading as the Brooklyn (N. Y.) Auto Top Co., asked of the Bruns Automobile Co., also of Brooklyn, on a broken contract for tops dwindled to six cents when the evidence was placed before a jury in the Supreme Court for Kings county last week; it is stated by the Bruns company that if Segall hasn't received his six pennies they are ready and waiting for him.

Segall claimed he contracted with the Bruns company in June, 1910, to build 50 tops, but that before the contract was completed it was broken by the Bruns company to his damage in the amount which he asked.

The defense set up was that Segall had been building tops for the Bruns company's cars for two years without a contract and that a contract for 50 was signed in 1910 upon Segall's plea that by showing a contract he could get better prices on the materials required in manufacture; before the contract was fulfilled the Bruns company secured an opportunity to sign up as a Chalmers dealer and notified Segall that no more tops would be required on the contract, to which arrangement he is said to have agreed. It was also stated that since the termination of the contract Segall had been given $500 or $600 worth of work by the Bruns company and that it had thrown considerable other work his way.

It was supposed the matter was satisfactory all around until last fall, when Segall filed his suit. The jury's verdict in effect is a statement that while Segall is technically right in his complaint he did not suffer greatly and is entitled to nominal damages only.

Changes Among Prominent Tradesmen.

C. R. Reiley has been appointed manager of the Moline Automobile Co.'s Minneapolis branch. Previously he was connected with the factory organization in Moline.

H. G. Harper has been appointed inspector general of the Studebaker Corporation in Detroit. He is not new to his duties, having been the organizer of the inspection system under which one of the most prominent cars in the country is produced.

Harry W. Doherty, who formerly represented the Studebaker Corporation in that part of the country, has been appointed Northwestern district manager for the Henderson Motor Car Co., of Indianapolis. He will make his headquarters in Tacoma, Wash.

Samuel M. Cooley has been appointed general manager of the Prest-O-Lite Co., of Indianapolis. The appointment is in the nature of substantial promotion, Cooley having been connected with the Prest-O-Lite interests for several years, latterly as assistant general manager.

Frank Fickling has been appointed manager of the Motz Tire & Rubber Co.'s branch, which was opened last week at 1012 Fourteenth street, N. W., Washington, D. C. Fickling has been engaged in the accessory trade in that city for many years and is, therefore, no stranger to his territory.

Bert Latham, who has been identified with the trade in Chicago and Los Angeles for about 12 years, has been appointed manager of the San Francisco branch of the Simplex-Mercer Pacific Coast Agency. He succeeds Rene J. Marx, who resigned to become Pacific Coast distributer of Mercedes cars.

C. W. Thompson, of Rochester, N. Y., who previously was identified with the Cutting Motor Car Co., of Jackson, Mich., has been appointed New York sales representative of the Keeton Motor Co., of Detroit. He will cover practically the entire State and will make the rounds of his territory in a Keeton "six."

John Calder, former assistant manager of the Cadillac Motor Car Co., of Detroit, has been appointed acting vice-president of the International Motor Co., of New York. The appointment carries with it general supervision of the company's engineering designs and production of its there plants. L. P. Phillips, formerly the International works manager, becomes assistant to Calder.

S. W. Lowry, who has made a name for himself as the manager of the Pennsylvania Rubber Co.'s Pittsburgh branch, has been promoted to the management of the company's Los Angeles establishment, which carries with it direction of all of the South Pacific coast trade. In token of his good work, Lowry last week was tendered a banquet by the Pennsylvania officials and during the evening, to further emphasize his success, he was presented with a silver cup.

Warner Seeks Pay for Speedometers.

Speedometers to the value of $107.40 are the basis of a judgment filed last week in the New York county clerk's office by the Warner Instrument Co. against Earl H. Tritchman and Harry D. Chapin. They formerly traded in New York City as the Standard Automobile Supply Co., but are said to have "gone hence."

BATAVIA RUBBER OFFERS ITS PREFERRED TO THE PUBLIC

Bonus of Common Goes With It—Capital Is Desired for Enlargement—Company's Financial Condition as Disclosed.

In order to provide more working capital, the Batavia Rubber Co., of Batavia, N. Y., is offering for public subscription a portion of its $250,000 6 per cent. preferred stock, its authorized capital being $500,000. As a bonus, purchasers will be given one share of common with each share of preferred stock.

Bonds to the amount of $46,000, which do not mature until 1923, are outstanding, but if $100,000 of the present offer of preferred stock is sold it is the intention to retire the bonds in order that the preferred may become a first lien on the assets of the company.

With the money acquired, it is believed that the factory's output of solid tires for trucks can be at least doubled and that its net earnings will amount to $75,000 per year or more. The only inkling of the company's earning capacity is contained in a statement that during four months of 1912 its total sales amounted to $152,522 as against $112,314 for the corresponding period of 1911.

Its financial statement, as verified by inventory December 1st last, is as follows:

Assets		
Accounts receivable	$17,566.37	
Cash on hand	18.11	
Cash in bank	9,209.69	
Bills receivable	2,500.00	$29,287.17
Raw material	$24,108.68	
Stock in process	8,954.00	
Stock in factory, $13,734.86; on consignment, $42,957.65	56,692.51	89,755.19
Miscellaneous	$2,500.00	
Office fixtures	1,508.86	
Machinery, moulds, power, etc.	74,025.84	
Real estate	37,283.74	115,318.44
		$234,360.44

Liabilities.	
Capital stock, preferred	$12,000.00
Capital stock, common	74,000.00
Bonds	46,000.00
Bills payable at bank	26,965.13
Accounts payable	12,641.53
Surplus	62,754.14
	$234,360.80

More Room for Four-Wheel Drive.

The Four Wheel Drive Automobile Co. has voted to place contracts for the erection of two additions to its plant in Clintonville, Wis. The buildings will be of brick, 100 x 120 feet.

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In the Retail World

Alex. Atahly is about to open a garage and repair shop in Ocheyedan, Ia.

Don Cameron is making ready to open an automobile repair shop in Washburn, Wis.

Peter Treyesser and George Schiering have entered the garage trade in Cheviot, Ohio.

E. R. Wilson, of Omaha, Neb., is erecting new salesrooms on 25th street. He is Buick dealer.

Stein & Krell have established a garage business in Dubuque, Ia., on Front street; they are Ford dealers.

William H. Chownes has opened a garage and repair shop on the State road between Sparkhill and Tappan, N. Y.

Dyche & Duncan is the style of a new garage firm in Columbus City, Ia. They will handle Michigan and Case cars.

M. Bailey, former editor of the Marshfield (Wis.) News, has entered the trade. He has taken the Paige-Detroit agency.

John Martinsen, who recently opened a garage in Audubon, Ia., has bought the equipment of the James Law repair shop.

The Riddell Auto Co., of Des Moines, Ia., has opened a branch in Oskaloosa, in the same state; it is located at 213-15 1st avenue, West.

R. H. Shannon has sold his interest in Shannon & Bishop, of Marengo, Ia., to William Ince, of Des Moines; the firm stocks Ford cars.

Fred Gust has bought a half interest in the Porter Bros. Garage, First street, Fairmount, Minn. The style has been changed to Bassett & Gust.

James O'Connell, of Brooklyn, N. Y., has secured plans for a two-story garage which he will have erected on Boerum place; the cost specified is $35,000.

Edward Anderson, of Delavan, Wis., has sold his garage to Steven Conley; Anderson contemplates opening another garage in Clinton, in the same state.

J. A. Wetzel has purchased the interest of his partner, E. W. Ewbank, in the Pacific Auto Co., in Eugene, Ore. He will continue to handle Ford and Auburn cars.

C. A. Bartholomew has closed his garage in Peoria, Ill., following the sale of the building he occupied and its utilization for other purposes by the new owner.

William H. Gragg has taken over the Allen Garage, on Broad street, Beloit, Wis. R. R. Allen, the former owner, retires, but Bert Allen will continue as manager.

The Mason City (Ia.) Auto Co. has completed a new garage at Washington and Fifth avenues. The equipment includes toilet and rest rooms. Ford and Colby cars are stocked.

The Boschken Motor Car Co., of San Jose, Cal., has commenced the construction of a new garage and salesrooms at First and San Salvador streets. The company is Oakland dealer.

M. Beauchamp, formerly connected with the Locomobile and Stearns agencies in Chicago, has entered the Motor Supplies Co., of 1200 Michigan avenue. He is president of the company.

The Howard Automobile Co., of 10th and Olive streets, Los Angeles, Cal., has established a used car department at 1148-50 South Olive street. The company is Pacific Coast distributer of Buick cars.

The Republic Tire Agency has opened up in Indianapolis at 35 West Michigan street, with E. A. Stone as manager. As the name indicates, the store will stock Republic tires and tubes and also will handle accessories.

L. E. Parker, formerly an employe of the Stewart-Warner Speedometer Corporation, is about to open a tire repair shop in Beloit, Wis. The firm style will be Beloit Tire & Cycle Co. In addition, a line of bicycles will be carried.

The People's Taxicab Co., of Altoona, Pa., has secured permission to erect a garage and repair shop, 40 x 60 feet, at 2200 Beale avenue; the cost will be $2,300. George F. Fleet, the proprietor, is a former police sergeant.

The Hollywood (Cal.) Garage, located at 1728 North Highland avenue, has been purchased by C. H. Kratz and Carl S. Frank, both formerly of Cincinnati, O. Kratz was secretary and treasurer of the Vulcan Copper Works, of Cincinnati.

New quarters have been completed for the Packard Kansas City (Mo.) Co. at Robert Gillham road and McGee street. The building is two stories and 97 x 116 feet and contains separate salesrooms for the R. & L. electrics, which are a part of the company's line.

The Sigourney Electric Garage has entered the trade in Hartford, Conn., in a new brick building, 100 x 35, located at 117 Sigourney street. C. H. Brooks, formerly with the Westinghouse Electric Co., in Pittsburgh, Pa., is president, and W. J. Congras is secretary and treasurer.

C. L. Du Puy has formed the Standard Auto Co. in Atlanta, Ga., with salesrooms at 225 Peachtree street. He will stock Paige-Detroit cars and Selden cars and trucks. Du Puy is not new to the trade, having been Southern representative of the Selden Motor Vehicle Co., of Rochester, N. Y., for five years.

J. F. Lang & Son, of Princeton, Ill., have purchased a garage, 62 x 125 feet, built recently by Edward Holmes, and have taken possession. Lang & Son handle Stoddard-Dayton, Howard and Krit cars and Excelsior and Pope motorcycles. The building contains a women's waiting room and has a storage capacity of 33 cars.

William Kingsley has entered the trade in Fairbault, Minn., under the style Central Auto Garage; his building, located at Central avenue and Division street, contains 17,000 square feet of floor space. The concern has agencies for Detroiter, Reo, Premier, Marmon and Stutz gasolene cars, Ohio electrics and Reo trucks.

The United Motor Supply Co. and O. Fernstermacher, automobile supply jobbers in Minneapolis, Minn., have combined under the style O. Fernstermacher Co. Some of the officers of both organizations are in the new one and the company, which is capitalized at $300,000, will retain the Fernstermacher location at 311 South Fifth street.

The Auburn Sales Co., Roy Scott manager, has been formed in San Francisco to handle the Auburn car; the company is made up largely of those who handled the R. C. H. retail business prior to the recent discontinuance of the R. C. H. branch in that city, and the turning over of the business to the H. O. Harrison Co. Temporarily headquarters are in the R. C. H. building on Ellis street.

The Schierbrock Automobile Co. has taken over the Atlantic Automobile Co., of Council Bluffs, Ia., of which T. A. Mitchell was proprietor; the new company, which is composed of R. J. Schierbrock, of

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Neola, J. J. Muree and L. E. Julich, of Carroll, both Iowa towns, will retain the old company's 4th street location. The transfer carries with it the Ford and Studebaker agencies.

The Gordon W. Turner Co., which heretofore has engaged in the used car business in Boston, Mass., has branched out and added supplies to its line. It has purchased the store, stock and fixtures of the bankrupt Equitable Distributing Co., at 245 Columbus avenue, and will operate at this address. Arthur Sidwell, the former manager of the Distributing company, will remain in the same capacity with the new owners.

Schiller & Creswell, who recently succeeded the Utica (N. Y.) Electric Garage Co., located at 75 Cornelia street, have purchased property at Noyes and Francis streets, in the center of a residence section; the property, which is 118 x 150 feet and includes a round brick building 80 feet in diameter, will be remodeled as an exclusively electric garage and salesrooms. The firm, which handles Detroit electrics, will occupy its new quarters May 1.

The W. L. Huffman Automobile Co., of Omaha, Neb., has located in new quarters at 1814-18 Farman street, formerly occupied by the J. J. Deright Garage. W. M. Clement, formerly with the George Rogers Cigar Co., has been made general manager and N. J. Marvin, bookeeper for Huffman for two years, has been appointed to manage the branch in Sioux Falls. S. D. Huffman will devote more time to affairs within his territory, where he has several branches.

Carl H. Page & Co., Chalmers distributers at Broadway and West 50th street, New York City, have installed a branch in Brooklyn, at Bedford avenue and Fulton street. This territory formerly was covered by the Bruns Automobile Co. While the branch will handle retail sales in Brooklyn and wholesale matters throughout all of Long Island, the territory of Sammis & Downer, of Huntington, who have Nassau and Suffolk counties, will not be affected. Harry Unwin, formerly with the Page store in New York, is manager of the branch.

The Royal Automobile Co., of Montreal, Que., has been succeeded by the Royal Automobile Garage Co., Ltd., with a capital of $50,000. The new company will maintain salesrooms at the former location, St. Denis and Ontario streets, for the distribution of Cole, Stevens-Duryea and Apperson cars and will operate a garage at 375-85 Ontario street. The officers are: President, G. A. Simard; vice-president, H. Beauregard; secretary and treasurer, Dr. E. Dubeau; directors, H. Danereu, former Cole and Stevens-Duryea dealer, and E. Barlatier, former Apperson agent.

JACOBS WOULD PLAY MOSES TO OWNERS OF MOTOR CARS

Would Lead Way to Promised Land of Discounts—Unravelled Mystery Discloses U. A. O. P. A. and Beautiful "Aims."

If artlessness proves of avail, E. A. Jacobs, of New York, soon will be wallowing in wealth. Jacobs evidently has heard of leagues and associations and societies whose desire to "protect" automobile owners is of the burning sort, and having heard of them he has more or less organized one of his own. It is carrying the impressive title, United Automobile Owners' Protective Association, and its "main office" appears to be the office of E. A. Jacobs, at 29 Broadway, where a sign on the door—like Jacobs's letterheads — reads "Investment Securities."

The first that many New Yorkers knew of the United Automobile Owners' Protective Association was when they last week received a letter on Jacobs's "Investment Securities" letterhead telling them that their names had been given to Jacobs by "a mutual friend who is one of our pleased members," and imparting the delightful information that "This is not an association like the numerous others now in business whose aim it is to make big profits for themselves."

In equally delightful fashion, Jacobs referred to the discounts he is able to quote and expresses the pleasure he will feel if the recipients of his letters will forward him $5, which will "entitle them to a member's card" and "permit them to begin trading at once." Thereafter Mr. Jacobs develops a streak of exquisite artlessness and throws a spell of mystery around his project, for, listen to the gentleman himself: "The name of the association is kept quiet on account of interfering with our purchasing privilege."

Who would not undertake to penetrate such a deep, dark mystery, even if he did not surrender $5 for the purpose?

Motor World's investigation located the U. A. O. P. A. in Jacobs' "Investment Securities office," as stated. Jacobs himself was not present, but his representative—whose appearance also suggested that his name might be Jacobs—cheerfully handed out the "Protective Association's" literature, which included an "Application for Membership Buying Privileges." The signing of it binds the owner to pay $5 per year in advance until doomsday, unless he notifies the association to the contrary. In return therefor, Jacobs very kindly agrees to furnish such automobile supplies "as he may be able to obtain (note the "may") at dealers', jobbers' and manufacturers' prices."

He also further handsomely "agrees to maintain, without expense, to the members," a "home office," and even more benevolently binds himself to mail annually to each "member" "a printed catalog." In order that there may be no misunderstanding on the point, the conditions printed on the application for membership include this soothing clause: "This constitutes the entire contract."

It is also provided that all checks be made payable to the order of the association, but for some reason orders for accessories must be sent to Jacobs personally.

Although the application makes appear that the $5 fee is for the gracious privilege of buying goods, Jacobs's letter states that it is "for the registration of your car."

The way in which automobile owners are to be "protected," and what they may expect, is indicated by a yellow leaflet which promises nothing but asks the recipient whether he desires to save so much money on a number of several enumerated articles.

But the "aims" of the U. A. O. P. A. are the real things. Jacobs himself has painted the picture. He has closed both eyes and made himself see an U. A. O. P. A. automobile factory, a tire factory, an accessories factory, a club house, a chain of hotels, and ever so many other things, all designed for the "protectiveness" of the deal old automobile owner who gives up $5 to Jacobs.

More Suits Against Long Island Garage.

Unpaid accounts are the basis of several recent suits against the Cook-Borstel-Brown Co., garage operators in Huntington, L. I., and one resulted this week in a judgment of $188.70 in favor of the Fisk Rubber Co. Another action is brought by the Mutual Auto Accessories Co., of New York City. Both suits are in courts in New York City.

Michelin Gets Judgment Against Dealer.

Judgment for $607.98, in favor of the Michelin Tire Co., of Milltown, N. J., against Leonard A. Crozier, proprietor of the Floral Park (N. Y.) Garage, was rendered in the Supreme Court for New York county last week. The amount represents the value of tires consigned to Crozier for which he failed to render an accounting.

Fisk Calls Woodmere Man to Court.

Claiming that goods supplied between October 1 and November 3, 1911, are unpaid for, the Fisk Rubber Co., of Chicopee Falls, Mass., filed suit this week in the Supreme Court for New York county against J. M. Richmond, a garageman, of Woodmere, N. Y. The amount asked for is $100.25.

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DESTINY OF GASOLENE SUBSTITUTES.

As pregnant with possibilities as is the present fuel situation, what with several substitutes for sure enough gasolene in sight, it would seem that there is at least one angle which, if not entirely overlooked, has not entered into any discussion of this much-discussed subject. Though the gasolene producers profess to be in sympathy with the movement to find something just as good as gasolene, it would be a grievous misunderstanding of human nature to suppose that they would stand idly by and see such a rich prize slip through their fingers merely for the want of cash.

In these days of enlightenment (of the purchasing power of gold) money will buy pretty nearly anything and that "pretty nearly anything" may very easily include patents or processes designed to alleviate the fuel situation by substituting some other product for the commercial petroleum derivative; already, it is reported, the British Shell interests have purchased outright successfully operable patents for extracting "petrol" from paraffin, and thus at least one infant industry has been gobbled up by the trust almost before it became known. That others will go the same way seems reasonable, for the petty prizes that have been offered for a gasolene substitute are as molehills to mountains compared with the inducements the oil companies are able —and apparently willing—to offer inventors.

The British case is a typically British one, of course, with the subject of the King grasping the bird offered by the trust, with his conservatism or doubt urging him to overlook the two in the bush in the fear that they may escape him in the form of too strenuous opposition or production obstacles. Just what the speculative American would do in similar circumstances it is difficult to foresee, though if past performances can be taken as a criterion, it is not unlikely that he would prefer to take his chances on getting a firm grip on the tail feathers of the birds in the bush—and therein lies the hope. But even the proverb declares that hope is a slender peg on which to hang ambition.

OUTLAWRY AND A WORLD'S FAIR.

If they have not already done so, the gentlemen who rebelled against the American Automobile Association for enforcing in California the same rules that apply in all other parts of the country, should pause in their folly and consider its effect on the Pacific-Panama Exposition which is due to be held in San Francisco in 1915.

In the natural order of things, automobile events will cut a figure in the sports which are to be attendant on the great fair. By the same token, they must be held with the sanction and under the rules of the A. A. A., for it is not reasonable to suppose that the management of such an international enterprise will cast a blight on the exposition, or permit its success to be in any way jeopardized by recognition of outlawry in any form, or in any sport. And as the A. A. A. is the only sports' governing body recognized by other sports' governing organizations here and abroad, if, peradventure, the Pacific-Panama authorities should recognize the outlaw body which has been loosely organized on the Pacific coast, it will mean that the Pacific-Panama sports will be closed to the rest of the world, and that the only participants in them will be the disgruntled "native sons." On the other hand, as seems inevitable, when the sports are sanctioned by the A. A. A., they will be closed to these very outlaws, who of necessity must compete in their own backyards, so to speak, if they compete at all.

It is not a particularly agreeable prospect and unless they are carried away by their own misguided enthusiasm they will do well to stop just where they are and undo what they have done. The success of the big exposition ought to transcend more or less personal grievances.

FORMULA THAT IS MERE APPROXIMATION.

That the method of rating automobile motors by the antiquated A. L. A. M. formula gives only an approximate figure that may or may not come near to the real horsepower of an engine, and therefore is chiefly useful as a rough means of obtaining comparative data, long has been known, and though the recent action of the Council of the S. A. E. in indorsing the formula despite its evident shortcomings may occasion mild surprise, the very fact that it has been indorsed only as "an approximation that will suffice" ought to stimulate the search for something better. The palpable fallacy of the formula lies in the supposition that the crankshaft speed will decrease in proportion to any increase in stroke over the "square" motor, and though it may suffice as an "approximation" of power, now that nearly every engine is a long-stroke engine the approximation scarcely can fail to be sadly awry.

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AJAX INAUGURATES MILEAGE CONTEST FOR CHAUFFEURS

Will Give $500 for Chauffeurs' Best Tire Performance and 207 Minor Cash Prizes—Conditions Governing Contest.

Emulating the example of the Winton Motor Carriage Co., the Ajax-Grieb Rubber Co. has formulated and promulgated an annual service competition for users of Ajax tires. It provides for the award of prizes, 208 in number, to chauffeurs driving Ajax-tired cars who, in the twelve months between April 1st next and March 31st, 1914, make the best mileage records.

The first prize will be $500, the others being apportioned as follows: 1 prize of $300, 1 of $200, 5 of $100, 10 of $50, 40 of $25, 50 of $20 and 100 of $10.

The Ajax-Grieb company will provide blanks for those who desire to enter the competition. The blank will require that there be recorded the size of the tire, the make of car on which it is to be used, the date of purchase, the date on which the tire is put in service, the serial number of the tire, the speedometer reading, and where the tire is bought. This is to be signed by the employer of the chauffeur, and the information will be copied on cards at the place where the tire is bought.

To complete the competition, notification will be made when the tire has ceased its usefulness, the date when it was removed from the car, the speedometer reading and the number of miles covered by the tire. This is all to be signed by the owner and returned within five days after the tire has been taken out of service. Any number of tires for one chauffeur count in deciding the contest.

The three judges who will decide the awards will be Alfred Reeves, of the Hartford Suspension Co.; M. L. Scudder, a New York chartered accountant, and R. A. Patterson, president of the Tarrytown (N. Y.) National Bank.

While the money prizes will go to the chauffeurs, it naturally follows that the latters' efforts to obtain mielage from their tires will accrue to the financial benefit of the owners of the cars.

Tire Men to Oppose Dating Bill.

In an effort to defeat the ill-smelling tire-dating bill, which is half way through the New York State legislature and which demands that tire manufacturers stamp their products with the date of manufacture, Sidney S. Meyers, representing the "tire group" in the Motor and Accessory Manufacturers, will appear at 2.30 o'clock this afternoon, 20th inst., before the Miscellaneous Corporations Committee of the Senate. Meyers will present the claims of the tire men that the bill is unnecessary and impracticable, that it would work an injury to the tire trade, that it would achieve no good and that it is unconstitutional. Meyers endeavored to get a hearing when the bill was before the Assembly, but the measure went through on greased wheels, despite his protest. Should it pass the Senate and be signed by the Governor, the tire men will contest it in the courts. They will expend no money to defeat the measure in the legislature.

Garageman Krauss Wins Another Suit.

Henry Krauss has been having considerable trouble as president of the Washington Bridge Auto Co., of New York City, but with the winning by him of a lawsuit in the Supreme Court for New York county this week he hopes he can settle down and conduct his business peacably; the suit just concluded grew out of an act of the former president of the company. Krauss's predecessor held a chattel mortgage for $4,000 on the company property, and when he sold his stock he transferred half of the mortgage to Krauss and then proceeded to file a satisfaction of the whole thing. Krauss sued to have half of the satisfaction set aside and succeeded. $2,000 worth of it becoming again effective. Prior to this Krauss had sued the company to compel it to pay a damage claim which a person injured by a company car had secured against Krauss as president of the company.

Omaha Organizes Credit Association.

The Automobile Supply and Jobbers' Credit Association has been formed at Omaha, Neb., to "look into" the standing of those to whom credit is extended. The officers are: President Clarke G. Powell; vice-president, Arthur Storz; secretary-treasurer, L. C. Kohn. The board of directors comprises the officers with T. V. Groves and H. L. Waldman.

Gray & Davis Enlarging Once More.

Gray & Davis are again adding to their large and strikingly handsome plant in Cambridge, Mass., where they are now laying the foundation of a new building, 381 x 81 feet. It will be of five stories and built entirely of reinforced concrete with steel sash and tapestry brick facing. It is expected that the structure will be ready for occupancy about July 1st next.

Federal Opens Branch in Detroit.

The Federal Rubber Mfg. Co., of Milwaukee, Wis., has opened a branch in Detroit at 846 Woodward avenue. It is in charge of A. L. DeVault.



*Indicates Sanction by A. A. A.

March 17-22, Norfolk, Va.—Norfolk Automobile Trade Association's second annual show in the State Armory.

March 19-22, Springfield, Ill.—Springfield Commercial Association's show in the Armory.

March 19-26, Boston, Mass.—Boston Commercial Vehicle Association's annual show in Mechanics' Hall.

March 24-29, Indianapolis, Ind.—Indianapolis Automobile Trade Association's show.

March 24-29, Watertown, N. Y.—Annual show of the Watertown Automobile Dealers' Association in the State Armory.

March 29-April 5, St. John, N. B.—New Brunswick Automobile Trade Association's show in Queen's Rink.

April 1-6, San Francisco, Cal.—San Francisco Automobile Dealers' Association's motor truck show.

April 5-12, Pittsburgh, Pa.—Pittsburgh Automobile Dealers' Association's seventh annual show in the East Liberty Market building.

April 14-16, Chicago, Ill.—Chicago Motor Club's reliability tour for commercial vehicles.

April 16-17, Taylor, Tex.—Track races under the auspices of the Taylor Automobile Club.

May 5, Washington, D. C.—Start of the reliability-economy run for commercial vehicles under the auspices of the Washington Post.*

July 1, Indianapolis, Ind.—Start of the Indiana Automobile Manufacturers' Association's cross continental tour to Los Angeles, Cal.

May 30, Indianapolis, Ind.—Third annual 500-mile sweepstakes races on the motor speedway.*

May 30, Chicago, Ill.—Annual Interclub reliability run of the Chicago Motor Club and the Chicago Athletic Club.

June 21, Algonquin, Ill.—Algonquin hill climb under the auspices of the Chicago Motor Club.

June 25-28, Chicago, Ill.—Reliability tour of the Chicago Automobile Club.*

July 4, Taylor, Tex.—Track races under the auspices of the Taylor Automobile Club.

July 4-6, Tacoma, Wash.—Road races under the auspices of the Montamara Festa Automobile committee.

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McCLELLAND BILL LIKELY WILL SLUMBER IN PEACE

Opposition Offered at Hearing in Albany Practically Dooms Obnoxious Measure—Some of the Objections Raised.

It is now altogether unlikely that owners will have to wear badges like their chauffeurs, as provided in the now famous—or infamous—McClelland bill, which was introduced into the New York legislature on the 6th inst., and it is equally improbable that they will be subjected to a doubling of license fees and all the various other obnoxious provisions which it sought to impose; for as the result of the public hearing on this and other measures, held in Albany on Thursday last, it is practically assured that the bill will be permitted to die a peaceful death in the pigeonholes of the Internal Affairs Committee. This belief is shared by all of those who attended the hearing, and considerable strength was added to it by the subsequent action of Senator White, who is chairman of the committee, in introducing a bill authorizing Governor Sulzer to appoint a commission of three to co-operate with similar commissions representing Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New Jersey, Pennsylvania, Delaware and Maryland in an effort to obtain uniform automobile legislation.

Although the hearing covered the score or more measures that have been introduced, the chief point of attack was the McClelland-McGrath bill, as being at once the most drastic of all and the most important, inasmuch as it was drafted in accordance with the views of Secretary of State Mitchell May and indorsed also by Governor Sulzer himself.

As usual, Charles Thaddeus Terry, representing both the National Association of Automobile Manufacturers and the Automobile Dealers' Association, led the opposition, and his review of the McClelland bill was both scathing and thorough. In drawing attention to the fact that when two years ago the Callan law was passed, increasing the taxation from $2 to $5, $10, $15 and $25 with annual registration, it generally was conceded that the million dollar increase in revenue it represented was at least partly justified to offset the expense of motor vehicle registration, he stated that if the present proposed increase to net $2,000,000 a year to the State were conceded, motorists might as well make up their minds that still further advances would be made each year. "That is not regulation or taxation," he declared, "it is confiscation." Adding that New York had never been "a pirate State," Terry continued:

"If the theory is that those using the highways should pay their proportionate share of the cost of the improvement, then every citizen of the State using the highways should be required to pay his proportionate share, and any method adopted by the legislature of this State to help pay for the cost of highway improvements which casts upon one class of citizens more than their proportionate share, imposes an unjust and discriminatory tax and is unconstitutional. The revenue derived now is far in excess of the amount required to defray the expenses of the regulation of motor vehicles, and there is no justification whatsoever for the increased taxes. The rates for pleasure cars already are as high as they ought to be; if the rates in other States were higher there might be some reason, however unsound, for the suggested amendment."

In pointing out the incongruity of taxing commercial vehicles according to their weight, he drew attention to the obvious fact that very few of them are operated on the State roads and further stated that "it is against the policy of the State to tax an instrument of commerce, and the motor truck is now becoming a necessity in the business world; to increase the tax and compel an owner to pay a personal tax as well is laying a double burden on the business man who adopts the motor truck as a means of conveyance."

Melvin Bender, of Albany, who is attorney for the New York State Automobile Association, which embraces all but two of the motoring organizations in the State, was another who attacked the measure vigorously. Among other things, he suggested that if the tax is based upon the use of the roads, then every vehicle, irrespective of its motive power, rightfully should be taxed.

The only man at the hearing who supported Secretary May in his defense of the measure was Frederick R. Coudert, who said he represented the so-called National Highways Protective Association. Briefly, Coudert pooh-poohed the idea that the taxation of motor vehicles was an infringement of individual rights and gave as his opinion that while the Callan law is a good law, it requires the addition of an amendment to make it still better. His criticism, despite his championing attitude, was destructive rather than constructive, however, for he advocated merely the vesting of some power in the Secretary of State to allow him to revoke a chauffeur's license for "running his car like a fool," and a speed provision that would presume the operator of a car to be guilty of negligence when he exceeded the speed limit. He also declared for an examination of owners.

"CHAUFFEUR ARISTOCRATS" ORGANIZE EXCLUSIVE BODY

French Auto Workers' Association Results from Clique in High-Class Garage—Members Employed by Millionaire Owners.

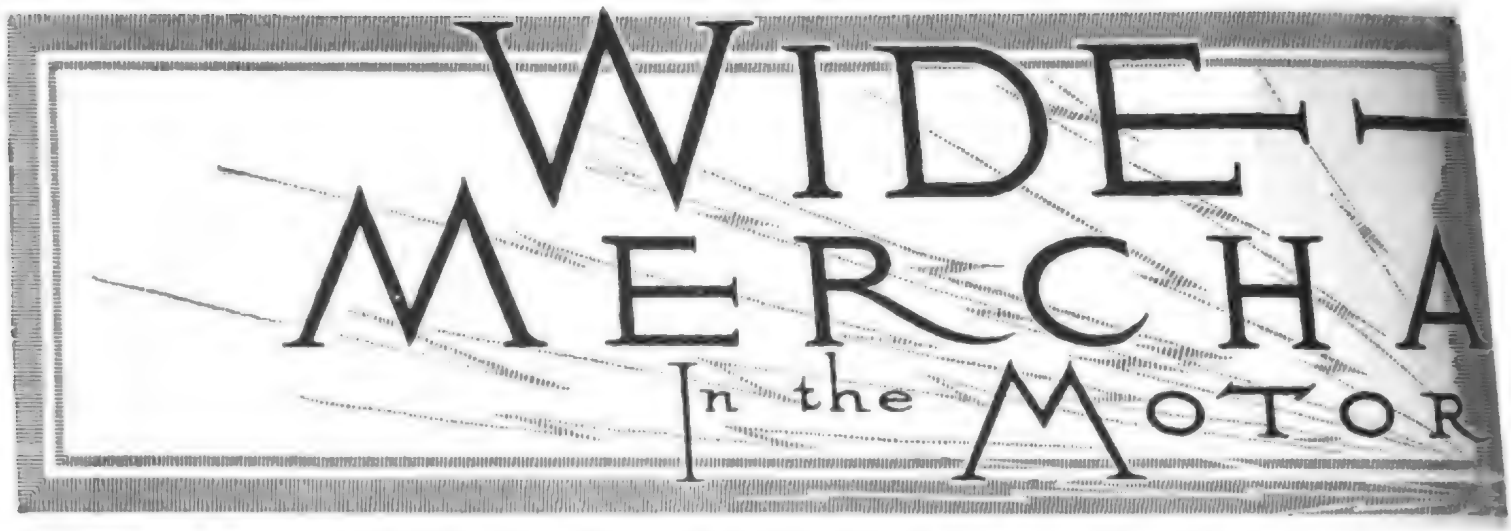
What might be termed the "Aristocracy of Chauffeurdom," or what may correspond to the Head Chauffeurs' Association in England, has been formed in New York City by a number of drivers and mechanicians in the employ of some of the city's wealthiest car owners under the name French Auto Workers' Association; the organization's certificate was approved last week in the Supreme Court for New York county and plans for the full launching of the project are under way, not that it will possess a large membership, for when all the eligibles are enrolled the group probably will be found to consist of not more than 35 or 40.

The idea originated with a group of chauffeurs whose employers' cars are stored in the garage of the Automobile Club of America, and since these few men felt a common bond because they were employed upon cars of French make they gradually formed a clique; then the idea of uniting with other men employed upon French cars was broached and the body was formed by Oeley Gavett, Warren S. Campbell, William A. Malone, Thomas Woods, Adolph Poret, Eugene Mesnard and Alexander Le Borgue; the last two and Raoul Devort, Victor Sancier and Leon Von Molle are directors.

While the membership is not restricted to men of French nativity or extraction, as the names Malone, Campbell and Woods suggest, a large number naturally will be Frenchmen and capable of speaking that tongue, since many wealthy owners in New York's multimillionaire group are prone to engage drivers who can act as interpreters on European tours; many of these drivers have assistants and regard themselves as of a class apart from the ordinary gasolene pilot. In fact, it is said that a sure method of self-extinction for a taxicab chauffeur, even though he were French, would be to apply for admittance to this exclusive circle.

The object of the body, as stated in its certificate, is largely social, but provision will be made for the interchange of ideas and information relating to the foreign cars which these men handle; also a clubhouse or clubrooms are being considered. No location has been chosen, however, but the clubrooms probably will be secured in some location conveniently located to the Automobile Club's garage.

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WEEDING OUT GARAGE LOAFERS

Shooing Away the Pest Who Makes the Garage or Salesroom His "Hangout"—How He Happens and the Treatment He Needs.

A voice from Indiana says, "Please say something about the garage loafer in your "Wideawake Merchandising Department." And the subject is one about which much may be said.

Wants To Be Identified With "Gas."

There is a species of human barnacle known to the trade as the "garage loafer." His age ranges anywhere from 15 to 50. His business is to be somewhere near where gasolene is used. He has never owned a car and never expects to own one. He likes to be identified with the gasolene fraternity. He does not want to work at anything. He just wants to be "around." His entrance is usually made at the back door of the garage; he was perhaps one of a crowd who gathered to see Bill Jones's car tested. The rest of the crowd dissipated, faded away, if you like, but he remained, like a piece of driftwood cast up by the tide.

He pays no attention to the "No Smoking" sign that the insurance people ordered up, but goes calmly ahead and makes up his "Bull Durham" cigarette or fills his evil-smelling pipe. He watches the repairs as they are made, perhaps assists with his suggestions. Gets into conversation with customers who drop in and gradually drops into the role of an habitue of your place of business.

Unnoticed Until Well Established.

You have seen him around a few times and supposed he was someone whose car was being fixed; then first thing you know he is spending part of the time in front in the salesroom, spitting and dropping ashes on the floor and looking out at the people as they pass by. Later he takes to sitting in the driver's seat of your car—then back to the greater luxury of the tonneau. Perhaps by this time he has a friend or two with him and has made the floor covering in the tonneau look like the back door mat of an alley entrance. He is not blatantly offensive and oftentimes is well connected. You hesitate about ordering him out; perhaps you know his family; but after he has butted in once or twice you finally summon up courage enough to tell him to "Beat it!" You should have done it six months ago.

Garage loafers of any age have no place in the automobile business. They are a menace and a nuisance. They are impossible! They should be swept out the back door at their first appearance, and if they persist in thrusting their obnoxious personalities on you further, the police should be invited to participate in the eliminating ceremonies.

VALUE OF HAVING FULL STOCKS ALWAYS ON HAND.

One of the most successful dealers in Iowa, who during the past year sold not less than 140 cars priced above $1,200, credits much of his success to the fact that he always had an ample stock of cars on hand. Even when it got close to time for new models he had a stock of cars from which he could make immediate deliveries. And he made them. He did not carry over one. His shipments were so arranged that he always had from 10 to 15 cars on hand. Every time a fresh shipment came in he let the cars stand out in front of his store all day so people knew his goods were moving.

Affording Buyers a Good Variety.

Then the effect of show-room always full made it appear as if he had a large stock, which showed more plainly than words that he had the utmost confidence in the salability of the goods; it also gave people a chance to select, and there is a lot in that idea. People like to look over several articles, in order to buy one, whether it is automobiles or baby buggies. If a customer wanted a car the day the order was placed this dealer could give immediate possession and most of the other dealers had to ask them to wait. He got the best business and made the most money; and, given equal selling ability and equally good reputation, the dealer who carries the stock ready to meet the demand is the one who will make the greatest and the surest sales. The truth of this will be more and more apparent as the automobile business is developed still further.

GETTING NAMES OF PROSPECTS.

"One good turn deserves another" ought to be written large on the flyleaf of every automobile salesman's order book.

When you have delivered a car and thus created a satisfied and delighted customer, then is a bully good time to secure the names of his friends who are likely to be interested.

Do not hesitate about asking for this information. It costs your customer nothing, and if you have properly sold him on your car and made him an enthusiast he will be keen to help you line up his friends.

"CASHING IN" ON FACTORY TIPS.

Factory tips to dealers as to methods and plans and business-building ideas are not always given the careful, serious consideration they deserve. There is this one thing to be thought of: The factory cannot cash in on a single idea it advances for its dealers unless the dealer cashes in first. If it's a plan for making more sales it is the dealer who first is assured of his profit. Think it over. Of course, there are exceptions, but beware lest, being afraid of exceptions, you miss all the good ones.

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AWAKENDISING WORLD

LETTING OPPORTUNITY ESCAPE

Permitting "Ripe" Prospects to Slip Away for Lack of Attention—Doctor Who Bought a Car in Spite of the Dealer.

That a man may inquire the price of storage space in a garage and still not be a car owner was evidenced by a recent happening in Cleveland. He may be a prospect.

It seems that a doctor had just moved into the city from a small town in the State. He was well-fixed financially and his first move was to buy a home. Soon after he was settled he began thinking of buying a car. He had no garage, but two blocks away was a dealer with a clean-looking store and a very efficient appearing garage.

Got Information But No Attention.

"Before I buy a car," mused the doctor, I'll find out where I can keep it." With this thought in his mind he paid a visit to the neighborhood garage. They told him their charges, which were perfectly satisfactory, but they did not show any particular interest in him—did not even ask him what kind of a car he owned—did not ask him his name or where he lived. He wanted to know their rates and they told him; that's all there was to it.

Going out through the salesroom, the doctor espied a runabout that struck him as being about the niftiest thing he had seen. He inquired the price and they told it to him. On his way he went. Here was a rich, ripe prospect walking into their salesroom and out again and nobody any the wiser. It happens every day in the large cities.

Finally Sold Himself the Car.

Daily the doctor went past that garage. The beauty of the runabout in the window grew on him. He dropped in again to look at it. He brought his wife to the window to view it. Three months later he bought it. He sold it to himself.

Well, what's the point? You ask. The point is that if a real live salesman had been on the job the sale would have been made three months sooner—and the dealer would have been three months' storage ahead, besides being sure of the sale.

WHERE SALESMAN FOUND INSPIRATION AND STRENGTH.

An automobile salesman in Jackson, Mich., who is always on the alert for a hint or a suggestion that will make him a still better salesman, found an idea in Motor World a few weeks ago that helped him land a sale that looked like a "goner."

Where a Motor World Story Helped.

"I followed the suggestion that I read in one of Motor World's stories; and I am convinced that otherwise I would not have had the sale. The man was very persistent; he wanted all sorts of things; and then he wanted a cut price. I told him our position plainly, showed him the folly of the "cut price"; explained that throwing in accessories was exactly the same thing; told him we would stand pat on our prices—and then, instead of remaining on the defensive, I turned on him and asked him one or two questions that put him on the defensive. He could not give the right answer without embarrassing himself, so he left.

Refused to "Cut" But Made Sale.

"In the afternoon he came back, saw my father, and remarked that I was pretty independent and had told him I absolutely would not cut any prices, that he wanted to get a concession. Father did not say much, but he did say, kind of slow like, 'My son told you we would not cut prices, didn't he? Well, he usually means exactly what he says.' That was the finishing touch, and the order came across at regular price without any extras of any kind. But if I had not read that Motor World story I would not have been ready for him and we would probably have missed the sale. Believe me, I am reading the paper closely every week."

"KNOW THY CAR."

To be enthusiastic about the car you sell, you must believe in it. How can you believe in it unless you know it?

Knowing a car does not mean familiarity with its specifications. It means taking the specification book in hand and checking up each detail so you know exactly what is meant and whether or not the catalog exaggerates or understates. It means taking the plate off the transmission and getting a firm mental grip on every detail of its construction, the gears, the shafts, the bearings, the shifting fingers, etc. It means a similar study and thorough grasp of the rear axle, the motor, the lighting and starting systems, if such are used.

Understanding Every Detail of Car.

Then it means asking for full information on any detail or part that you do not fully understand. When you have gone this far and have driven the car so that you know its economy, its power and its comfort you are fortified to talk with anybody.

Sales often have been lost by lack of a ready answer regarding some vital point of construction. The point is not that you are expected to tell the customer all the things you know, but, as you cannot tell what he will ask, you must and should be informed on every point that could possibly come up.

MAKING STUDY OF CAR DISPLAY.

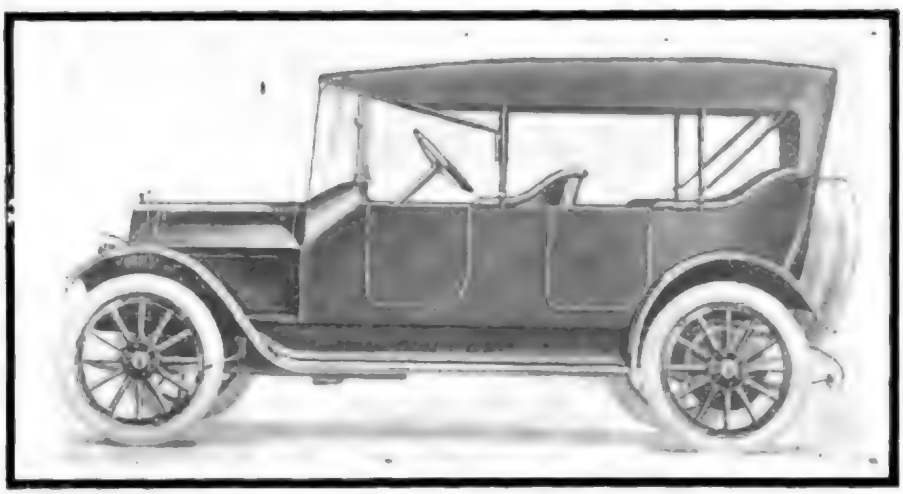
There is nothing you have to sell that will not be better sold and sold oftener if it is displayed in the best possible manner; if you sell cars, for instance, study the placing of cars on the salesroom floor.

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FIRST TRIBUNE PRODUCT WELL STANDARDIZED CAR

Employs Long-Stroke Block Motor in Which Accessibility is Keynote—Unusual Lamp Equipment Supplied.

First details of the Tribune, as the car constructed by the Tribune Motor Co., Detroit, Mich., of which Louis G. Hupp, formerly secretary of the R. C. H. Corporation, is the moving spirit, will be styled, reveals an uncommonly well standardized product in the construction of which such well-known trade names as Buda, Timken, Brown & Lipe, Gemmer and others are conspicuous. For the time being, or until a larger factory can be put up in Detroit, building operations will be confined to the production of a single five-passenger model which is to sell, completely equipped, for about $1,250; eventually, the line will be increased by the addition of roadster, limousine and other types.



SIDE VIEW OF FIRST TRIBUNE FIVE-PASSENGER CAR

The motor in the newcomer is a Buda of the familiar L-head type, with its four cylinders cast in a single rigid block which is supported at three points in the chassis frame, thus providing for a certain amount of weaving and removing the strain from the supporting arms. The bore and stroke measure 3¼ inches and 5½ inches, respectively, giving 234 cubic inches cylinder capacity and a total brake horsepower of 35 at 1,500 revolutions. Large valves and a comparatively short intake manifold are conspicuous features of the motor and legitimately may be expected to contribute to high efficiency. Lubrication is effected by a force feed constant level system and a high tension magneto furnishes ignition sparks.

One of the distinctive features of the motor is that the pistons and connecting rods—the latter are exceptionally long—can be removed from the bottom without the necessity for dismantling the motor. The removal of the oil pan exposes the connecting rod bearing caps, which, when taken off, permit the pistons to be extracted from the bottom; it is not necessary to take out the crankshaft. Both the crankcase and the oil pan are made of aluminum and a bell housing to accommodate the multiple disk clutch is cast one-half integral with the crankcase and the other half integral with the oil pan. To discourage accumulations of dust and dirt, the cylinders are carefully enameled to present a smooth surface and the exposed metal parts are nickel-plated. Intake and exhaust manifolds are on the left side with the magneto on the right side.

From the motor, power is transmitted to a full-floating Timken rear axle through the intermediary of a Raybestos-lined multiple disk clutch that may be run either dry or in an oil bath, and a three-speed selectively controlled gearset. Gear ratios on the various speeds are worked out to give a reduction of 13 to 1 on the first speed, 6¾ to 1 on the second speed, 3 11/13 to 1 in direct drive and 15¼ to 1 for reverse. The axle housing is of pressed steel and encloses a five-pitch bevel gear and pinion. Conforming to the present tendency, the steering gear, which carries a Gemmer name-plate, is mounted at the left side with the gear shift and emergency brake levers in the center of the footboard.

Indicating the liberality of the manufacturers, the total braking surface provided is considerably in excess of the one square inch per 10 pounds of car weight laid down as a requirement as the result of recent tests of brakes, the service set being internal expanding and operated by pedal and the emergency set being external contracting; the total surface provided is 320 square inches; the weight of the car in touring trim is 2,300 pounds. Both sets of brakes are on rear wheel drums.

The frame is of the single drop type formed of channel section steel with three cross members reinforced with integral gussetts. It is supported in front on semi-elliptic spring members measuring 37 x 2 inches and having six leaves; rear springs are full-elliptic with the under member hung beneath the axle to lower the center of gravity of the car. These rear members measure 42 x 2 inches and are finished off at the back with a single scroll. Wheels are shod with 32 x 3½ non-skid tires, both front and rear, and are of selected second-growth hickory; wire wheels will be supplied, however, though their specification increases the list price of the car by $50.

Quite as a matter of course, electric lights operated from a storage battery and generator, are supplied as standard equipment. One of the individualities of the lamp arrangement is that the head lamps carry 16 candlepower bulbs for use in touring and seven candlepower bulbs for use in city streets where less light is required. The remainder of the equipment includes a four-bow Pantasote top with patented quickly placed side curtains and a boot, rain vision windshield, speedometer, electric horn, demountable rims with an extra rim, robe and foot rails, and the usual jack, pump, tool kit, tire repair outfit and spare parts.

May Make "Junk" Law Cover Accessories.

The increase in the volume of thefts of automobile tires, lamps and other accessories has led the police commissioner of San Francisco to request the Board of Supervisors to amend the law which requires second-hand dealers to make daily reports to the police of articles received and to keep an accurate record of their business; as the measure now stands it specifies certain articles and includes bicycles and tools, but the automobile accessories are not included. The police commissioner's suggestion is that the law be made to read "Goods, wares, merchandise or articles of any description." The police officer's request is backed up by automobile insurance companies, which favor such revision.

Alcohol for Cleaning Lamp Lenses.

Alcohol, or a mixture of alcohol and water, is very good for cleaning glass lamp lenses, electric light bulbs, etc. Incidentally, it is surprising the amount of light that a film of dust or dirt can cut off, and there is a very perceptible difference between the light of a clean lamp and that of one that is even slightly in need of cleaning. Needless to add, alcohol must not be used in proximity to an open acetylene flame.

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REILLY PLACES ESTIMATE ON SELF-CONFIDENCE

Tells the Sales Manager the Difference Between I-Don't-Believe-I-Can and I-Believe-I-Can Types of Men—Instances Where Confidence Was the Factor in "Making Good."

"Never mind that call for Mr. Reilly," said the telephone girl in the front corridor of the factory as she pushed a plug in one of those numerous and mystifying holes in the switchboard and passed the order to the toll operator, her action immediately following the last faint cough from the muffler of Reilly's car as that individual stopped in front of the factory, touched the switch with his toe and closed the throttle.

"The Sales Manager was just trying to get you on long distance," remarked the girl as the dealer entered the outer doors, and upon receiving this information he jogged along toward the Sales Manager's office. As he entered, that dignitary looked up in amazement.

"Well, what do you want?" demanded Reilly, as if this method of answering a



long distance call were the most ordinary procedure.

"Whew!" ejaculated the Sales Manager. "Some telephone service! Here I tell the girl I want to talk to you, and five minutes later you walk in the door. I can't understand it. What are you down here for today?"

"Periodical visit," explained Reilly. "Easter suit—me and the wife."

"Well, I'm glad you came," asserted the Sales Manager. "Say! Do you know a man named Craig? He says you do. He wrote in about a job and wanted to see me, so I told him he could call this morning, and I wanted to talk to you before he got here. He's"——

Reilly Withdraws from the Situation.

"I'll bet that's the man now," remarked the factory man as the telephone jingled.

"Yes, send him in," he directed the girl in the front hall, and in a few seconds Craig appeared, but before he entered Reilly had



slipped out to wait in an adjoining office for the termination of the interview, which interview was not lengthy.

Reilly was reading a trade paper when the Sales Manager came to tell him the caller had gone.

Did Not Realize His Own Worth.

"What kind of a man is he, anyway?" asked the Sales Manager: "I didn't give him any definite answer, but told him that there weren't any openings now but might be later, and that I would ask you about him."

"What does he want to do?" asked Reilly.

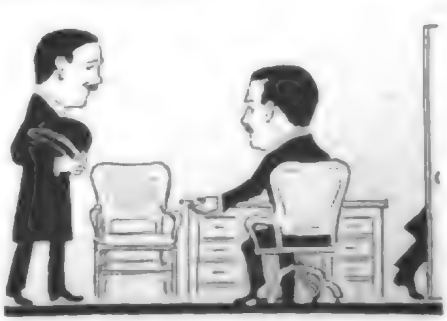
"He says he'll do anything," replied the Sales Manager. "He doesn't look like a man who would accept any old kind of a job. Why, he says he used to be a dealer—is that true?"

"I'm afraid it is," answered Reilly.

"Well, what ails him? Why didn't he keep it up? Is he any good?"

"He's more good than he thinks he is," said the dealer, "which may appear somewhat enigmatical, but it's true, nevertheless. If he knew how good he was he'd be surprised, and if some one told him how good he was he wouldn't believe it."

"I'm glad you admit that statement is enigmatical," was the Sales Manager's response. "Perhaps what you said means something; does it?"



"Craig is afraid of himself," continued Reilly, not noticing the sarcastic interruption. "He lacks courage or confidence or whatever you want to call it. He's had all sorts of chances, but never did very much to get himself above mediocrity. He has ability and would make a good salesman if he only could convince himself that he could sell cars, or anything else for that matter."

"What good will he be to me?" queried the factory man.

"If you can wake him up and give him a few lusty kicks where they will do him the most good he will be lot of good to you," came back the dealer. "And not only that, but you will have done a good deed, which ought to win an extra small shovel for you



when you get down and at work on the big coal pile. Craig started out wrong; I've known him for years, and I don't think, unless he changes, that he'll ever get so high up in the world that he won't be willing to admit that I know him.

Lacking in Confidence When a Boy.

"Craig and I lived in the same neighborhood when he were kids and sort of grew up together, and now that I look back at it I can see that even when he was a boy he lacked confidence in himself. One day I suggested to Craig that we go out and sell newspapers and make a little change for ourselves. Craig liked the sound of the word 'change' but said he didn't believe we could sell papers. I asked him why not, and he said he just didn't think we could.

"I said, 'Other kids do, don't they? Why can't we?' He didn't have any very good explanation beyond his belief that we would fail, but we started out. Craig didn't surprise himself; he didn't sell very many papers. I didn't sell many, either, the first few days, but after I had licked a couple of

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kids who disputed my right to the street and had got a few regular customers I made quite a little money."

"Must hate himself, doesn't he?" asked the Sales Manager.

Got Along in Mediocre Positions.

"He ought to," replied Reilly. "He had numerous other jobs, and if it was something that didn't require much ability he got away with it, but when it was a question of standing on his merits he fell down after a time. When I told him I thought of getting a dealership in automobiles he looked surprised and said, 'Why, you never ran an agency!' That made me mad, and I said, 'I know I never ran an agency, but why can't I? Do you know any good reason why I can't?' He repeated that his reason was that I never had run one.

"After I began to show a little prosperity as a dealer Craig decided he would enter the trade, and he dug up a job as a salesman. He made just enough sales to hold his job, but the sales were mostly sure things that he hardly could have lost if he had tried to lose them. Then he saw how I was getting on and he decided that he would like to be a dealer. He finally secured an agency, but at the very start he told me he didn't think he could make it go. He didn't surprise himself, either; it turned out just as he expected it would and he gave it up. If you offered him your job he might take it but he'd 'be sure he couldn't make it go,' and he wouldn't. He would——"

Sales Manager's First Managership.

"Hah!" interrupted the Sales Manager, "that reminds me of the first chance I had at a sales managership. The old man in the company where I was working then was sitting in his office one day and, having heard that the sales manager had resigned, I told the old man I wanted the job. It jarred him for a minute and I could feel his eyes going clear through to my backbone as he stared for a minute and never said a word. Then he snapped out, 'Think you can do it?' I told him emphatically that I thought I could. 'We'll see,' he snapped again, and that ended the interview.

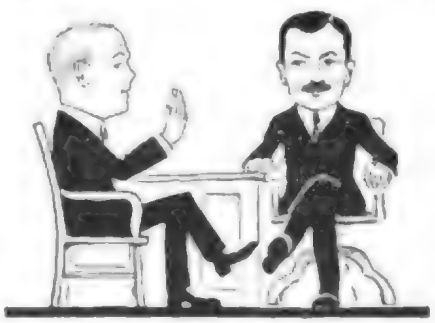
"A few days later he told me he would give me a trial, and when the time came I stepped into the bigger job with some work on my hands. If I do say it myself, I never once thought seriously of failing—I didn't have time. I certainly worked those first weeks, and bye and bye I began to feel that I was getting to a point where I had things going fairly well. It wasn't long before I knew I had pretty nearly made good."

"Craig couldn't pull off a stunt like that in a thousand years!" added Reilly. "He can work hard enough and has ability and all of that, but he lets this 'Suppose I fail? Suppose I fail?' keep bobbing up in his mind and it isn't long before he's saying, 'I know I'll fail, I know I'll fail,' and the next thing he says is, 'See! I failed, didn't I? Just as I said I would.' Men are pretty much alike. One man starts out with the determination and confidence that he is going to succeed and the other is obsessed with the idea and expectation that he will not succeed, and both of them wind up just where they expected they would. It's only the old story that a man can do what he believes he can. Craig believes the wrong thing."

Salesman Shows Trace of Scepticism.

"Do you expect me to believe that there is nothing a man can't do if he gets a notion he can do it?" sceptically asked the Sales Manager.

"Well, you 'it!'" protested Reilly, "you



wouldn't expect you could tip the factory over with one hand, would you?"

"Hardly!" replied the Sales Manager.

"There's reason in everything," added Reilly. "No sane man would expect to do such an impossible thing, although men have done things that others said were impossible. Napoleon thought he could conquer the world; he didn't succeed, but he got a mighty big handful of it. My grandmother used to tell about aiming at the moon and hitting a star, or something like that, which was but another way of saying that aiming high often lands you quite high, even if not as high as you hoped. You might say it was impossible for a man to be in three places at the same time, but Julius Cæsar did it. It must be true, too, for he wrote the story himself.

Confidence of Columbus and Wrights.

"Columbus never would have discovered America if he hadn't been confident that he could find land on this side of the ocean. He had to have confidence not only for himself but for three shiploads of men. The Wright brothers were so confident they could fly that folks thought the boys were crazy, but public opinion changed when they produced results."

"And," was the Sales Manager's comment, "if the old man who made me sales manager for the first time hadn't had unbounded confidence in himself and his business ability he wouldn't have any business to-day. Everyone said he was full of wild ideas when he kept soaking money into the business at a time when everyone said he was on his way to the financial graveyard—but he fooled 'em."

Self-assured Man Generally "Gets There."

"Sure!" responded the dealer. "It only bears out what I said—that a man who is confident in himself and thinks he can do things generally gets there."

"I suppose that, if you made up that mind of yours, your self-confidence would enable you to talk your wife out of an Easter hat, wouldn't it?" asked the Sales Manager with just a trace of semi-sarcasm.

"James," reprovingly replied Reilly, "no matter what a man thinks he can do, some things are impossible."

Post Office to Handle Parcels "Collect."

Having mastered quite satisfactorily the workings of the Parcel Post, Uncle Sam's employes will be given additional duties July 1 in this service, when there will go into effect an order providing for the collection by the Postal employes at its destination of whatever charge may be affixed to a C. O. D. package, thus making it possible for a store to mail a package to a customer "collect," leaving it to "Uncle Sam" to make the collection from the customer and to remit the amount to the sender; however, this applies only to packages whereon the charge is not in excess of $100 and an additional fee of 10 cents is charged, to be affixed to the package in stamps; also, the amount of collection must be marked on the package. This also will insure the package up to $50.

Beginning March 1 the special delivery system was made applicable to the Parcel Post, the regular ten cent fee being called for, to be affixed in regular or special delivery stamps.

Bromlee Urges Engine Starter Test.

By way of combining a mild form of excitement and a demonstration, Wayne K. Bromlee, sales manager for the Motor Car Mfg. Co., of Indianapolis, has proposed what he styles an electric "self-starter" race as a sort of prelude to the Decoration Day race on the Speedway, and if everything goes as it is planned some cars will be lined up in front of the Claypool Hotel, ready for the "race" on the 29th of May. All the cars are to be in touring trim and are to be propelled by their engine starters alone. As a precautionary measure, it is added that where the starter is attached between the clutch and the rear axle, the clutch must not be disengaged during the time of the contest.

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TRUCKS IN SHADE OF SHELTERING PALMS

They Replace Pleasure Vehicles in Boston's Babylonian Garden and Present a Brave Front Notwithstanding—Only Two New Trucks, Including a Steamer, Appear but Three Others are "On the Way".

With the trunks of most of the apple trees somewhat misshapen from the squeezing of the crowds of last week, but the foliage as green and umbrageous as ever; with the waterfalls of the Babylonian gardens hoisted bodily out of the landscape, but the rest of the scenery as Egyptian as possible in the presence of the dominating bulks of huge vehicles, the motor truck section of the Boston show was inaugurated in Mechanics' Building, yesterday (Wednesday) evening, with the usual first night crowds and the old-time difficulty of getting from one place to another any faster than the average speed of a slow-moving mass of humanity would allow. The man with the dictionaries has gone, and so has the life insurance agent, but the soft-voiced dispensers of soft drinks are still on the job and doing well, thank you

As to the main thing—the exhibit of motor trucks—it seems too bad, in a way, that Boston has its show so late in the season, for though it includes most of the machines of importance seen at other big shows, there are not many that have not already been more or less fully described in connection with other exhibits. It is not often that Boston does not bring out a few newcomers, and though this year's show is not quite an exception, it is a little unusual in that there is nothing radically new, in which respect it is in line with the important exhibitons that have gone before it since the begnning of the year.

Novelties Few and Far Between.

There is, however, a new gasolene truck and a new electric machine, the Sowers and the Edison, respectively. The Sowers is not only a newcomer, but it is so very new that the paint still is soft on the first model, which is a 1½-ton machine built on standard lines throughout. The motor, which is a Wisconsin of 3¼ inches bore and 5 inches stroke, is placed under the footboards and drives through a leather-faced cone clutch, three-speed selectively controlled gearset, jackshaft and side chains to the rear wheels, which are no less than 40 inches in diameter, with 4-inch solid tires. The front wheels are 38 inches, with 3½-inch tires; the wheelbase is 110 inches. The machine is listed at $1,950, with standard stake body. Another model is in course of preparation, built along the same general lines, but with the motor under a hood in front and a wheelbase of 130 inches; the same motor and transmission will be employed. The makers, the Sowers Motor Truck Co. of Boston, are arranging for a factory in that city.

The Edison electric truck was delayed in getting away from the factory as so was not in place for the opening of the show; it is expected to arrive, however, within a day or two.

Plenty of Trucks in the Basement.

Of course the Stanley steamer shows its round-fronted hood and its many valve-wheels and its nickel-plated high-pressure engine to the crowds; a Boston show hardly would be complete without it. Lonely as is the steamer among the hosts of gasolene cars, there seems no more possibility than ever there was of its abandoning its boiler and link-motion for a carburetter and magneto.

Not only has the Boston show made good in that practically all the cars named in the entry list have put in an appearance, but several not on the original list have turned up to help fill the big triangular building. These include the Mais and the Brown, which between them uphold the principle of internal gear drive through a live axle, Garford, Jeffery, Best, Flint, Gramm, and Selden. All of these except the Brown and Mais are in the basement, as are also the Little Giant and the Sullivan, to say nothing of an overflow from the Packard and White exhibits upstairs. The Packard basement contingent consists of no less than ten machines, mostly chassis, making one end of the cellar look like a Packard warehouse, while there are three big, black Whites over near the other end.

Fire Apparatus and Firemen Too.

As is usual, there is a goodly sprinkling of fire-fighting motor vehicles on view, and a number of visiting department officials made a round of critical inspection during the afternoon, before the doors were officially opened. The Knox people show their big pumping engine and a combination hose and chemical wagon, while the makers of the Pope-Hartford, Federal and White also have combination machines in their stands, and the Kelly-Springfield people show a fire and police patrol wagon. It goes without saying that all these machines are of the reddest possible red with the brightest of brass and nickel trimmings. All these concerns show also their standard models and the Knox, of course, makes a conspicuous feature of the Martin tractor.

While the Marmon 1,500-pound commercial car is not quite a new product, having been on the market for about a year, it is being exhibited for the first time at a big show.

The T-head motor is similar in design to the Marmon pleasure car motor but is smaller, the bore and stroke being 4 and 5 inches, respectively. It is rated at 25 horsepower and is automatically controlled by a governor that permits a maximum car speed of 20 miles an hour. The motor is carried on a three-point suspension. Final drive is by shaft, the intermediate transmission elements including a dry multiple disk clutch and three-speed selectively controlled gearset. The wood wheels are 32 inches in diameter and are fitted with four-inch pneumatic tires front and rear. In fact, apart from the motor and a few details, the commercial Marmon is built along the same lines as the pleasure car.

The Packard exhibit in the Babylonian section of the building literally holds not only the center but all the rest of the stage, for it is on the platform at the end of the hall that the machines are grouped, and so numerous, in fact, are they that half a dozen overflowed to the floor in front of the stage and, as already stated, ten trickled into the basement. Scarcely less numerous were the exhibits of the Peerless, Pierce-Arrow and White.

Representative Showing of Electrics.

Electricity is well represented. Atlantic, Buffalo, Couple-Gear, Waverley, Edison, G. M. C., and General Vehicle—seven, count 'em—electric cars make a decidedly formidable showing, though none of them are departing from their well-known methods and models. The Couple-Gear, the feature of which is its self-contained electric motor wheel, is shown by the Eldridge Mfg. Co., which has the knack of taking a pair of motor wheels and a box of battery cells, sticking two of the wheels under the front of a

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wagon and the battery box under the body or under the driver's seat and turning out a slow-moving but powerful and economical outfit. Six new designs are shown, all driven by a single pair of front wheels except two, one being of the semi-trailer type with four driving wheels, the weight of the battery on the front wheels and the weight of the load on the rear driving wheels and the trailers, and the other a dump-cart with a single driving and steering wheel in front. This probably is the only heavy commercial car built with direct steering, and hand wheel being mounted on an extension of the fork in which the wheels turns, exactly like a bicycle. It is said that there is no difficulty in steering the machine, the fact that the steering wheel is also the driving wheel apparently preventing the transmission of strain and shocks to the driver's hands.

Unusual Provision for Third Man.

One of the little details that help to adapt a truck to the needs of a particular line of business is seen on a Packard furniture truck. Furniture movers usually need a crew of three men, and in order to accommodate this number the seat is extended to the left, overhanging the running board and providing ample room for the third man.

One of the very few exhibits that did not turn up, but which caused considerable curiosity, was that of the Flanders Motor Co., which, with the Detroit and Edison electrics, are represented by "breathing spaces" in the hall, though the Edison, as already explained, is on the way. The usual crowds surrounded the Packard, Locomobile, and other exhibits in which tipping bodies rose and fell to the accompaniment of humming electric motors and, incidentally, entirely spoiled the Babylonian effect for a radius of many yards.

Some of the Show Outside Building.

Outside the big building, where the trucks were unloaded from the cars and hooked onto a cable to be dragged up a long incline into the hall, there was an interested, if small, assemblage of early arrivals "taking stock" of the machines under the glare of the early spring sun. While most of the machines were towed to the spot, a few were under their own power, and among them the Lauth-Juergens, which attracted their share of attention because of the extremely smooth, regular working of their motors and the excellent clutch action. Even when throttled down to the limit the motors of these cars continued to run without a miss and with steam-engine-like steadiness, though obviously raw from the factory.

Little Newness in Accessory Exhibits.

While the exhibitors of accessories are a lonely lot, by comparison with the number present at the pleasure car show, there are enough to make quite a respectable showing, thanks to the fact that they have been moved together so as to leave all the blank spaces in a block—a much better arrangement than leaving yawning gaps between exhibits. Of the 60 exhibitors showing parts, sundries and supplies, 51 are "holdovers" and the remaining nine newcomers. As is the case with the cars, the accessories are for the most part those which have been seen at other shows. The newcomers in the accessories department are as follows: Baldwin Chain & Mfg. Co., driving chains; William H. Brown, Trafilog truck recorders; Federal Chain & Mfg. Co., Federal and Gaylor non-skids; Gibney Tire & Rubber Co., Gibney tires and vulcanizers; Neverskid Mfg. Co., non-skids; Polack Tire & Rubber Co., Polack tires; Service Recorder Co., truck recorders; Sewell Cushion Wheel Co., Cushion wheels; Whitney Mfg. Co., Whitney driving chains.

SUMMARY OF COMMERCIAL VEHICLES EXHIBITED AT BOSTON SHOW

American Locomotive Co., Providence, R. I.—Alco.
Autocar Co., Ardmore, Pa.—Autocar.
Atlantic Vehicle Co., New York City—Atlantic electric.
Boston Motor Co., Boston—Selden.
Bowman Co., J. W., Boston—Waverley electric.
Buick Motor Co., Boston—Buick.
Chase Motor Truck Co., Syracuse, N. Y.—Chase.
Chicago Pneumatic Tool Co., Chicago, Ill.—Little Giant.
Connell & McKone Co., Boston—Overland.
Curtis-Hawkins Co., Boston—Speedwell.
Dodge Motor Vehicle Co., Boston—Buffalo electric.
Driggs-Seabury Ordnance Corp., Boston—Vulcan and Bessemer.
Durant-Dort Carriage Co., Flint, Mich.—Flint and Best.
Edison Electric Vehicle Co., Lawrence, Mass.—Edison electrics.
Eldridge Mfg. Co., Boston—Couple Gear electric.
Fuller, Alvan T., Boston—Packard.
Garford Co., Elyria, O.—Garford.
General Motors Truck Co., Boston—G. M. C. electric.
General Vehicle Co., Long Island City, N. Y.—General Vehicle electric.
Grand Rapids Motor Truck Co., Detroit, Mich—Decatur.
International Harvester Co., Akron, Ohio—I-H-C.
Jeffery Co. of N. E., Thos. B., Boston—Jeffery.
Koehler Sporting Goods Co., H. J., Boston—Koehler and Hupmobile.
Kelly-Springfield Motor Truck Co., Springfield, Ohio—Kelly-Springfield.
Linscott Motor Co., Boston—Reo.
Locomobile Co. of America, Bridgeport, Conn.—Locomobile.
Maguire Co., J. W., Boston—Pierce-Arrow.
Maddocks, H. Ross, Boston—Stewart.
Mais Motor Truck Co., Indianapolis, Ind.—Mais.
Mercury Mfg. Co., Chicago, Ill.—Mercury.
Myer, Abrams & Co., Boston—Lauth-Juergens.
Peerless Motor Car Co. of New England, Boston—Peerless.
Pope-Hartford Co., Boston — Pope-Hartford.
Power Truck Sales Co., Boston—Adams.
Rawding, Leslie G., Boston—Atterbury.
Sanford Motor Truck Co., Syracuse, N. Y.—Sanford.
Sowers Motor Truck Co., Boston—Sowers.
Stanley Motor Carriage Co., Newtown, Mass.—Stanley steamer.
Smith Co., A. O., Milwaukee, Wis.—Smith-Milwaukee.
Sullivan Motor Car Co., Rochester, N. Y.—Sullivan.
Underhill Co., Boston—Knox.
Universal Motor Truck Co., Detroit, Mich.—Universal.
Velie Motor Vehicle Co., Moline, Ill.—Velie.
Victor Motor Car Co., Buffalo, N. Y.—Victor.
White Co., Boston—White.
Whitney-Barney Co., Boston—Federal and Standard.
Wing Motor Co., F. E., Boston—Marmon.

SUMMARY OF ACCESSORIES EXHIBITED AT BOSTON SHOW

Ajax-Grieb Rubber Co., New York City—Ajax tires.
Austin & Doten, Boston—Shelby steel tubing.
Baldwin Chain & Mfg. Co., Worcester, Mass.—Non-skids.
Batavia Rubber Co., Batavia, N. Y.—Batavia tires.
Bell, Bayers & Woodbury, Boston—Lighting systems for cars and garages.
Bowser & Co., S. F., Fort Wayne, Ind.—Gasolene and oil storage systems.

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Boyd, Shirley F., Boston—R. J. V. ball bearings.

Brown, Wm. H., Cleveland, Ohio—Trafilog recorders.

Champion Ignition Co., Flint, Mich.—A-C spark plugs.

Charles A. Jackson Co., Boston—Apleo lighting system.

Clark Foundry Co., Rumford, Me.—Machine tools.

Coes Wrench Co., Worcester, Mass.—Wrenches.

Cramp & Sons Ship & Engine Bldg. Co., Philadelphia, Pa.—Parsons white bronze bearing metal and worm gearing.

Dean Electric Co., Elyria, Ohio—Tuto and Rexo horns, Dynalux lighting systems, Elyria-Dean and Ohio starting and lighting systems, Elyria-Dean speedometers, etc.

Diamond Rubber Co., Akron, Ohio—Diamond tires.

Dixon Crucible Co., Jos., Jersey City, N. J.—Graphite lubricants.

Dunn-Ray Co., Boston—Electric headlight lighters.

Edison Storage Battery Co., West Orange, N. J.—Edison batteries.

Electric Storage Battery Co., Philadelphia, Pa.—Exide batteries.

Expansion Tire Co., Boston—Cushion tires.

Korine Carbon Remover Co., Amesbury, Mass.—Carbon remover.

Federal Chain & Mfg. Co., Springfield, Mass.—Non-skid devices.

Firestone Tire & Rubber Co., Akron, Ohio—Firestone tires.

Fisk Rubber Co., Chicopee Falls, Mass.—Fisk tires.

Gibney Tire & Rubber Co., Philadelphia, Pa.—Truck tires and vulcaniers.

Goodrich Co., B. F., Akron, Ohio—Goodrich tires.

Goodyear Tire & Rubber Co., Akron, Ohio—Goodyear tires.

Gray & Davis, Inc., Amesbury, Mass.—Electric starting and lighting systems and lamps.

Harris Oil Co., A. W., Providence, R. I.—Lubricants.

Hartford Suspension Co., Jersey City, N. J.—Truffault Hartford Shock absorbers, Hartford jacks and bumpers and electric starting and lighting systems.

Heinze Electric Co., Lowell, Mass.—Heinze magnetos and other ignition devices.

Jaeger Co., Boston—Marine and stationary motors.

Jones Speedometer, New Rochelle, N. Y.—Jones speedometers and recorders.

Kelly-Springfield Tire Co., New York City—Kelly-Springfield tires.

Marburg Bros., Inc., New York City—Mea magnetos, S. R. O. ball bearings, Marburg-Hagen springs.

Motz Tire & Rubber Co., Akron, Ohio—Motz cushion tires.

MacDonnell-Webster Co., Haverhill, Mass.—Scientific inner tubes.

Never-Skid Mfg. Co., New York City—Non-skid devices.

Ozo Co., Boston—Carbon remover.

Perfection Filler Co., Somerville, Mass.—Tire fillers.

Pennsylvania Rubber Co., Jeannette, Pa.—Pennsylvania tires.

Polack Tyre & Rubber Co., New York City—Polack tires.

Remy Electric Co., Anderson, Ind.—Remy magnetos and electric lighting and starting system.

Ricker Bennett Co., Cambridge, Mass.—Paints.

Robinson & Son, Wm. C., Boston—Lubricants.

Rose, P. R., Boston—Microscopes.

Sages Trunk Co., Boston—Automobile trunks.

Service Recorder Co., Cleveland, Ohio—Service truck recorders.

Sewell Cushion Wheel Co., Chicago, Ill.—Cushion wheels.

Splitdorf Electric Co., Newark, N. J.—Splitdorf magnetos and other ignition devices and electric lighting systems.

Standard Welding Co., Cleveland, Ohio—Electrically welded tubing and parts.

Stewart & Clark Mfg. Co., Chicago, Ill.—Stewart speedometers.

Swinehart Tire & Rubber Co., Akron, Ohio—Swinehart tires.

Texas Co., New York City—Texaco lubricants.

U. S. Light & Heating Co., New York City—U-S-L starting and lighting systems.

United States Tire Co., New York City—United States tires.

Vacuum Oil Co., New York City—Mobil lubricants.

Veeder Mfg. Co., Hartford, Conn.—Tachometers, odometers and die cast parts.

Vesta Accumulator Co., Chicago, Ill.—Vesta batteries and lighting systems.

Warner Instrument Co., Beloit, Wis.—Warner Autometers

Weed Chain Tire Grip Co., Boston—Weed tire chains.

Whitney Mfg. Co., Hartford, Conn.—Whitney chains.

Willard Storage Battery Co., Cleveland, Ohio—LBA batteries.

Wolverine Lubricants Co., New York City—Wolverine lubricants.

Car Prize Helps Cedar Rapids Show.

Bait, and attractive bait, too, in the shape of a 1913 motor car, which was offered as a door prize to the holder of the lucky ticket, was used to entice the good people of Cedar Rapids, Ia., and neighboring towns to the annual show of the Cedar Rapids Automobile Dealers' Association, which closed its doors in the local auditorium on Saturday evening last, March 15th. Decorations were of a simple nature, but were none the less eye-pleasing. The ceiling and the balcony were obscured by a canopy of pink bunting which was banked with incandescent lights. Suitable posts bearing signs announcing the names of the cars on display marked the booths and smilax-laden bowers partially covered the aisles. Of the 33 different vehicles which were shown by 19 dealers, none save the Denning tractor, a farm implement made by the Denning Farm Implement Co., was of local production. The cars on view were:

Moline, Paige, Thomas, Speedwell, Case, Overland, Metz, Enger, Empire, Paterson, Marathon, Abbott-Detroit, Mitchell, Studebaker, Ford, Rambler, Denning tractor, Oakland, Detroiter, Chalmers, Lozier, Michigan, White, Reo, Cole, Hudson, Velie, Baker electric, Cadillac, Garford, Matheson, Richmond, Davis.

Forty-three Dealers at Peoria Show.

Peoria's third annual show under the auspices of the Peoria Automobile Dealers' Association closed its doors in the Coliseum in that Illinois city on Saturday evening last, March 15th, having held forth for four days, from Wednesday evening, March 12. The usual vine-grown and flower-bedecked trellis work and the orthodox white pillars topped with potted palms to separate the booths, not to mention myriad varicolored incandescent lights, and very much daintily tinted bunting comprised a decorative setting that was eye-pleasing if not wholly original. Twenty-eight different makes of motor cars, both pleasure and commercial, were exhibited by the 23 dealers who held space, and naturally the two local productions—the Glide car and the Avery truck—were very much in evidence. Accessories were displayed by half a dozen dealers. The cars shown were:

Broc electric, Detroit electric, Waverley electric; Ford, Chalmers, Inter-State, Packard, Avery truck, Cole, Hupp, Reo, Moon, Rambler, Case, Hudson, Peerless, Westcott, Overland, Michigan, Studebaker, Buick, Paige, Franklin, Regal, Glide, Cadillac, Apperson, Warren.

When Exhaust Pipes Create Steam.

Probably more than one person has received a bad scare on a wet day when, on stopping his car, it has been immediately enveloped in what looked and smelled like a cloud of smoke. Investigation generally reveals that it is nothing more fearsome than steam caused by water splashed onto the hot exhaust pipe. If the water is dirty and contains combustible matter, the illusion is likely to be more complete.

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BRITISH PETROL BARONS PUT UP PRICE OF "GAS"

Both Principal Companies Make Four-Cent Increases In All Grades—Heavier Fuel Is Offered at the Former Price.

Echoing recent American advances in the price of gasolene, the British Petroleum Co., which is the sole distributer for the United Kingdom, of the Shell products, has advanced the price four cents a gallon, the market price of Shell Spirit, which is practically the same as gasolene, now being 43 cents a gallon. Incidentally, either to placate users or to stimulate the use of heavier fuel, a new brand has been brought out under the name of "Shell II"; it is slightly heavier than Shell Spirit and sells for 39 cents a gallon, which was the prevailing price of the latter up to about one week ago.

At the same time the Anglo-American Oil Co., which produces Pratt's Perfection Spirit, also has advanced its prices, bringing them up to those of the Shell distributers, and also has added another brand which is known as "Pratt's II"; Like "Shell II," it sells for 39 cents a gallon. The price of Pratt's Taxibus Spirit, which is the heaviest of all the fuels, has been advanced four cents a gallon along with the others and now sells for 37 cents. All of these fuels are sold in sealed tins containing two imperial gallons, the American equivalent of which is 2.4 gallons. Consequently, the prevailing price of the best grade Shell Spirit, judged by the standard of the United States gallon, is approximately 36 cents.

Court Rules on Owner's Liability.

If the owner of a car allows his chauffeur to use the car on a personal errand, and if the chauffeur while engaged on such personal business injures a person, the owner is not exempted from liability, according to a decision of the Massachusetts Supreme Court last week. It has not unqualifiedly said the owner is liable, but has ordered a retrial in a case wherein judgment was directed for the owner by a lower court.

The action was brought against William E. Denholm by Carroll Reynolds, who contended that he was struck by the latter's car August 7, 1910, while the chauffeur, who slept at the owner's house but ate at another place and had his laundry done at still another place, but all at the owner's expense, was on his way to get laundry, having his employer's permission to use the car. Commenting upon the action of the lower court in directing a verdict for the defendant and reviewing the manner of the chauffeur's remuneration and maintenance, the court, in directing a retrial, said:

"If under these circumstances the jury should find that the use of the automobile by the chauffeur in going for his laundry was an incident of his employment, or was assented to either expressly or impliedly by those having authority from the defendant to direct the conduct of the chauffeur, then we think the defendant would be liable."

Schimpf to Visit Troubled Section.

Having disposed of his business interests in Brooklyn, Wm. Schimpf, chairman of the contest board of the American Automobile Association, departed on Sunday last, March 16th, for a visit to the Pacific Coast, where he will "look into" the causes which had to do with the breakaway of a faction of Southern California motorists and their formation of the Western Automobile Association. Schimpf first will journey to Los Angeles, which it is expected he will reach on March 22d, and there he will consult with the powers that be in the Automobile Club of Southern California with a view to retaining that organization in affiliation with the national body. Action on the part of the club has been deferred until after the conference with the contest board chairman. It is expected that Mr. Schimpf will remain on the coast for some time to come the better to understand the situation in Western automobile circles.

Boast Costs a "Record Breaker" $25.

Hereafter, Rupert Jeffkins, who is an Australian and is fairly well known as a racing driver in this country, is likely to be more circumspect in boasting of his speed exploits. Jeffkins recently drove at a whirlwind clip between Oakland and San Jose, Cal., carrying a letter from Mayor Frank K. Mott to Mayor Monahan, and in doing so he smashed pretty nearly all the local speed laws between the two cities. Which might have been all right as far as it went, if he had not been over-anxious to tell about his "record breaking." But he was—and District Attorney Free of San Jose heard him and promptly did what every zealous district attorney should do under similar circumstances, even though two mayors aided and abetted the offense; he "pinched" Jeffkins, and had him arraigned on his own admission of having violated the law. Later, Jeffkins paid a fine of $25. No one saw him kick himself.

Clark M. Stewart has been chosen to head the Marysville (Kan.) Automobile Club. The other officers elected at the annual election of officers are: Vice-president, Joseph Ellenbecker; secretary-treasurer, E. O. Webber.

LEGISLATORS "KID" FATHER OF FREAK AUTOMOBILE BILL

North Dakota Man's Measure Is Sensationally Amended and Interred in Committee—What Happened to Would-Be Law.

"Kidding the father of a bill," that old method of killing an unpopular piece of proposed legislation, worked effectively last week in North Dakota when a rural member of the legislature introduced the typical rustic measure which requires the driver of a car to stop when signaled by the driver of a horse-drawn vehicle and to do sundry other things which would make automobile travel more or less of a comedy; the "kidding" took the form, of numerous amendments which went one better any of the propositions of the father of the bill.

One legislator tacked on an amendment requiring the driver of a car to "sprinkle the road for eighty rods when signaled by a farmer," and another dignified solon insisted upon a "twenty-five horsepower whistle" as necessary equipment. Besides automobiles and motorcycles, the law was made to include "road lice," wheelbarrows, aeroplanes, submarine boats and baby carriages, although the lawmakers conceded that a wheelbarrow or baby carriage with a "twenty-five horsepower whistle," or one that would sprinkle the road for eighty rods would be some vehicle.

This apparently didn't suit the fastidious tastes of the representatives of the people, and they further amended the bill so as to require a motorist to take his car apart and hide the parts in the bushes beside the road "when signaled by a farmer" and to carry a supply of skyrockets to send up when approaching a crossroads. After being thus "desecrated" the bill was humorously referred to the committee on military affairs, where it undoubtedly will rest in peace for some time to come.

President's Daughters to Drive Electric.

President Woodrow Wilson may be putting his most democratic foot forward as an initial appeal to the "dear common people" who have high hopes in his administration, but two of his daughters, Miss Eleanor and Miss Jessie, are appearing in a role which smacks somewhat more of an aristocratic taste. They are learning how to pilot an electric car in the Capitol City. Abel Long, who is in charge of the White House motor car equipment, is instructing the young womenn in piloting the vehicle which Miss Helen Taft drove successfully and skilfully through the streets of Washington during her father's incumbency.

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GETTING A BUSINESS MANAGER FOR THE GARAGE

Manager of Supply Store Who Has Dealt With Many Garages Discusses Their Weakest Point and Points to an Effective Remedy—Tells of Garages Which Play a Losing Game.

When merchandising and any trade are reviewed, it is found as a general rule that the trade and the merchandising methods have progressed together, if they have progressed at all; for instance, the shoe trade of even a quarter-century ago is not the shoe trade of to-day: the trade has grown, and with it have improved the merchandising methods, as is apparent in the store fronts, store displays and please-the-public attitude which exist. Hardware men and hardware selling are on the upgrade, the tobacco business has gone away beyond the wooden Indian period, and in other fields of endeavor modern men are building business by modern methods.

Men and Methods Progress Unequally.

That there can exist a condition wherein methods have progressed while the men of the trade have not done so may seem paradoxical, yet that such is true to a certain extent in the garage trade may not seem so absurd upon an investigation of the great blanket of garages which covers the country. This seemingly incongruous statement is made by Matthew D. Sweeney, who at the present time is the manager of Charles E. Miller's Eighth avenue store in New York City. Sweeney is well qualified to know whereof he speaks, for as former chauffeur for Miller, who is one of the trade's largest supply men, Sweeney has traveled thousands of miles and has come in contact with hundreds of garages.

As Sweeney expressed it, "This business is away above a lot of men who are in it. They are not business men—they're mechanics; and they're good mechanics but not business men."

Value of a Good Business Manager.

Asked what he would suggest as a remedy for this condition in the garage trade, Sweeney was quick to answer, "Place a business man in the garage."

"Take a partner?" he was asked.

"No," he replied, "often a partner is a bad proposition; hire a man to be business manager and make him draw the trade and build the business."

Sweeney added that many garages are one-man affairs where the hiring of a business manager would be too great an expense, and in that case he conceded that the success or failure of the establishment rests upon the ability of the proprietor to adapt himself to circumstances and fill the dual position of chief mechanic and business manager. In fact, it is but a few days ago that a Long Island garageman who has the basis of a flourishing business told Sweeney he was looking for a good man to act as a business manager for the place and to act as the "glad hand" between the shop and the public.

In the many miles that Sweeney has traveled as pilot of the Miller car there is but one garage which stands out in his recollection as an appeal to a man of merchandising instinct and as a pleasure to the "travel tired motorist." This garage is not in a big city, it is in Portland, Me., a city of only about 60,000 inhabitants.

Service That Brought in Trade.

"I think it's called the Hotel Garage," said Sweeney, "and I'll never forget it. We drove in one day and were greeted by a very pleasant man who immediately strove to take care of us to the best of his ability. He was the boss and he didn't do anything but be the boss; he certainly was a good investment to himself.

"After I drove in he said, 'Will you need any gasolene? We aren't very busy just now and can fill you up just as well as not if you need any.' I might not have bought any 'gas' until I got out on the road, but I knew the tank would stand quite a little, so I told him to fill it up. He called a young fellow and said, 'Herbert, will you fill the gentleman's tank?' Herbert was right on the job, and while he was pushing the portable tank to the car the proprietor said, 'How are your lamps? Do they need any oil? You're going up in the mountains and you will surely need your lamps.' When I assented, he told Herbert to fill the lamps.

"Then he asked me if I had any tubes that needed fixing. He said they had a fine repair department and could have any tires or tubes all fixed up by the time we were ready to re-start. I certainly never would have thought of that, but when he reminded me of it I remembered that I had two or three tubes that I had thrown into the car with the intention of getting them fixed up some time; so he got that job, too. Next he asked me if the batteries for the horn were all right. He said the horn might come in very handy in the mountains. I knew he was right about that, too, and I told him to look the batteries over and fix them up if they needed it. By that time I quit worrying about whether I needed anything or not, for I was sure that if the garageman couldn't think of it I certainly couldn't.

When Tactful Suggestion May Help.

"He got quite a little trade from that one car. If he hadn't suggested all those things I probably never would have thought of most of them until we were out on the road, and while we would have had to pay the bill some time, some one else would have gotten it. You don't know how a motorist appreciates being taken care of like that; nine times out of ten he needs something when he goes into a garage, but he never thinks of it until he is out on the road and needs it; and then he needs it bad. That manager's business ability is making lots of money for the garage that with other methods would pass right by the door."

"How about the other kind of garage?" was asked.

An Example of Bad Management.

"Lots of them!" replied Sweeney. "The worst one I know of and one that ought to pay big money is in a small town in New York State on the main line of East and West travel. Two partners run it. They are good mechanics but are poor business men. They have an opportunity for a wonderful trade, for it goes right by their door; but I don't see how they can stay above water much longer. We drove in there one day, and as we had to wait quite a while we had a fine opportunity to watch things. There must have been ten cars that came along while we were there, and most of them went away after tooting their horns and not getting a response. One man drove into the garage and honked his bulb horn for several minutes—nothing doing! Then he honked it some more—nothing doing! Then he cut loose with his Klaxon, and finally one of the partners came from the back of the shop, his arms covered to the elbows with grease and, as he entered, holding his hands up as if he were afraid they would touch something, he asked, 'Did you want something?' 'No!' roared the man in the car,

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ONE OF INDIANAPOLIS'S NEWEST AND MOST IMPOSING SALESROOMS



Quarters of the A. & M. Sales and Service Co., agent for American and Marion cars

'I just drove in to see if this was a moving picture show.' When he threw in the reverse and backed out he left a cloud of smoke that filled the place.

"Oh, yes; there was another man over in New England that I recall. I made it a practice to get a receipt for whatever I bought and I asked him for a receipt for gasolene. He rummaged around and found a sheet of paper, but when he came to make out the receipt his hands were so dirty and greasy that no one could read it after he had finished it. He looked perplexed, then handed the paper and pencil to me and blurted out, 'Here, make out your own receipt!'"

These last two are but samples of the many garages which are on the forgotten list, while the Portland establishment is of itself the entire remembered list. In the case of the two partners, were Sweeney's recommendation carried out, a man would be engaged to take care of the public and manage the business. A young man of ability who would take care of the office and would not demand a large salary could do much toward filling this position; at least, he could see to it that no man went away from the garage without an opportunity of making his wants known.

"Yes!" exclaimed Sweeney, "the office! Where do you find the office? Half the time you can't find it. It's stuck 'way back in the garage instead of being up front where a man who wants to do business can find it. Ninety per cent. of the offices are in the rear of the garage and the other 10 per cent. are out where they offer the motorist some means of getting in connection with the man they want to see.

Motorists who tour doubtless will remember that this is true even though they never happened to have thought of it before; when a man enters a garage and is not met at the door, he naturally looks for the office—sometimes he finds it. Sweeney has other tales to tell of employes who looked up at the toot of a horn but immediately returned to their polishing or other work, busier than ever, as if to say, "The nerve of that guy, to want me to wait on him!"

All of these things appear to be indisputable evidence that many men in the garage trade are not in tune with the methods of the day. The shoe trade, the hardware trade, and many others grew up through the days when merchandising was not the science it is today; but when selling improved they adopted the new things. It is true that the garage trade is young, comparatively, but there is no excuse for not being up-to-date in management. Other trades have developed selling and business methods which need only to be adopted, and efficiency plans have been so widely advertised as to be within the reach of anyone who realizes their value and cares for them; but despite this it is only the minority of garagemen who are growing wealthy as fast as they might. A plane of efficiency exists, the garage trade is fitted for it, and what Sweeney calls "real" garages are upon or near this plane, which is why he says that the trade is higher than the tradesmen. He means that the garage business is one which requires thorough business management and is one in which the installation of proper business-getting and trade-retaining methods is not difficult, yet is neglected.

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MAKING SHOP APPARATUS FROM COMMON MATERIALS

What Can Be Done With a Few Pipe Fittings and Pieces of Steel—An Emery Grinder That Is Good, if Homely.

It often happens that a man who has a small shop—whether he be an amateur or a repairman—loses a good deal of time because there are certains items of equipment that are lacking, perhaps because of the expense involved in their purchase. For instance, it is a common thing to find that emery grinding is done by putting an emery wheel on an arbor and mounting the arbor between the centers of a lathe. Undoubtedly this makeshift answers the purpose, after a fashion; but it is by no means as convenient as a separate grinder, and if the expense of such a tool is the only obstacle to its acquirement, it is readily swept away, for it is possible to make a very good grinder, as shown in the accompanying illustration, for a fraction of the cost of a factory-made article of the same capacity.

Things That Are Needed for the Job.

The materials required include a few pipe fittings, a short piece of steel shafting, a small pulley, a chunk of good babbit metal and some shaft collars and nuts—all of which are cheap and easily obtained. The size of the grinder may be anything up to one that will carry a 8-inch wheel on a ⅞-inch shaft. For larger work it is not advisable to follow the method described, because the power required is considerable and the stresses imposed are severe.

The first step is to make the standard of pipe fittings. For this the following items are necessary:

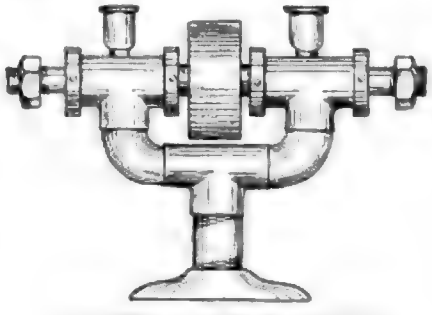
3 tees
2 elbows
4 close nipples
1 medium nipple
1 flange

Connecting Up the Pipe Fittings.

The medium nipple, which should have a length of approximately three times its diameter, screws into the flange, which is drilled for four holding-down screws. To the other end of the nipple is screwed one of the tees by its middle outlet, while the two elbows are joined to the other two outlets by the close nipples; each close nipple screws half way into the tee and half into the elbow, and the parts are tightened up until the nipples are completely covered. It may be necessary to file a little off the abutting faces of the tees and elbows in order to bring them close together all around and to bring them in the proper relative positions when tightened up. The two remaining tees are attached to the elbows by the two remaining close nipples, the same precautions being observed; they act as boxes for the babbit bearings, and should be lined up nicely.

"Rusting Up" to Prevent Loosening.

When all the parts have been put together and found to assemble properly they should be taken apart, care being taken to mark them so they will go together the same way, and all the threads, inside and out, freed from oil, which may be done by washing them in hot water and washing soda, or in gasolene. Then they are reassembled, the threads first being well wet with a saturated solution of salt or of sal-ammoniac, which will cause them to rust together so firmly that the whole frame will be practically a single piece. This is of importance because any movement of the



PIPE-FITTING EMERY GRINDER

parts with relation to each other would make trouble.

The spindle is made of a piece of high-grade steel shafting, which should have each end slightly shouldered and a thread cut on it in the lathe, so that it will be quite true. The nuts on these threads should have their faces true and at right angles to the axis of the spindle; otherwise there will be danger of breaking the wheels. An ordinary solid shaft collar fits closely against each shoulder, and two other collars are required having holes fitting snugly on the larger diameter of the spindle.

Babbitting the Shaft Bearings.

The next step is the babbitting of the bearings. The shaft, well smoked, should be held in position in the boxes by wooden wedges inserted in one box only; the wedging must be done so that the shaft will be in the center, leaving an equal amount of space all round for the babbit. Some care will be necessary in order to bring the spindle just right in the box that is without wedges. One of the larger collars must be on the shaft between the bearings. Bring this collar up against the inside end of the bearing that is not wedged, and plaster a layer of clay or asbestos and water around the joint. Place the whole thing in a vise, or set it up in any other secure way with the shaft vertical and the unwedged end uppermost. Heat the tee evenly all round with a blow-torch until it is hot enough to melt solder, and then pour in the babbit, which, when melted, should be just hot enough to make a pine stick smoke a little when plunged in the ladle. Incidentally, the opening in the tee, where it joins the elbow, must be filled, before the parts are put together for the last time, with wooden plugs.

Smoking the shaft consists simply in holding the parts that will be surrounded by babbit in the flame of a gas jet or oil lamp until a good even coating of soot is produced. This will prevent the soft metal from sticking to the shaft and at the same time will provide the slight clearance necessary to prevent the babbit from closing in too tightly when it cools, which makes scraping necessary.

Putting On the Finishing Touches.

When the babbit has solidified the opposite box may be treated in exactly the same way, first taking out the wedges, of course, and turning the frame with the filled bearing down. The two inside collars should be brought up close against the ends of the babbit bushings and, of course, a pulley mounted on the spindle between the bearings.

As to dimensions, the spindle diameter is the guide. The tees must be large enough to allow at least a full eighth of an inch all round for the babbit, as it is difficult to pour into a smaller space. When the fittings are put together they will indicate the length of the spindle, and the thickness of the wheel to be used will determine the length beyond the bearings. Pipe fittings are made in both light and heavy weights; the heaviest should be used. The babbit should be of high grade, and it should not be allowed to remain at pouring heat any longer than is necessary. For the lubrication of the bearings, holes should be drilled in the tops of the boxes and tapped for small oil cups, which may be filled with waste to retain oil and feed it slowly.

What May Cause Varying Compression.

A not uncommon experience with a motor is varying compression—that is, the compression of one cylinder will be perfect one day and scarcely perceivable the next; naturally perfect operation under these conditions is next to impossible. The trouble is due to stuck piston rings and the cause naturally suggests the remedy—loosening, with the liberal use of kerosene if possible, and if not, by disassembling the motor and removing the pistons.

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COMPANY WHICH HELPS ITS EMPLOYES BUILD CHARACTER

Pacific Coast Accessory House Directs Pointed Talks to Sales Force—Danger of "Brain Freeze" Is Emphasized.

Just who is benefitted the more, the employer or the employe, by an increase in the efficiency of the employe is open to more or less difference of opinion, for while an impartial critic might contend that the advantage is equal, the employer getting greater results and the employe qualifying for a better position, statements to the contrary are not uncommon, and they favor both sides; but that the employer who endeavors to prevent his helpers from rising too rapidly for fear they will demand more money is putting a stumbling block in his own business pathway appears to be the belief of the Weinstock-Nichols Co., which maintains accessory houses in Oakland, San Francisco and Los Angeles, Cal.

Those who are aware of the success which has been attained by the company are quite willing to concede that its methods must have had considerable to do with its progress, and those familiar with the methods employed know of the many instances when the company has put forward suggestions for the betterment of its employes. These have taken the form of four-page pamphlets and, issued frequently, contain on each occasion a thought which, if applied, is bound to work some change in the character or performance of the employe.

Also, that the Weinstock-Nichols Co. has the true spirit of general uplift of the whole trade is evidenced by the superscription upon the front cover, which says, "Some of our fellow employers are passing these around among their employes. You may want to do likewise. If so, we will furnish them free while they last." And in addition the folder carries a list of the company's stock, which is but another way of keeping the company's name and business before the public, for it is safe to say that the folders, which are extensively used as mailing inserts, are preserved in many instances by employers as well as by their employes. A mental jog which, however, need not be confined to the "sales force," to whom the folder is addressed, is contained in a late number in the series, which is as follows.

"Don't Let Your Brain Freeze."

"The Worker is ever in danger of mental dry rot. He is ever in danger of letting his brain freeze for want of mental exercise. Many of us are physically lazy. Many more of us are mentally lazy. We find it so easy to jog along at the same old pace that we are likely soon to fall into a rut. Once there, we are in danger of sticking. The moment we stick, we have mentally stopped growing. Having ceased, mentally, to grow, our brain begins to freeze and, as a rule, we have then reached our topmost commercial earning power.

"This is the case whether we happen to be eighteen or eighty years of age. In fact, years have nothing to do with it. There are men of eighty whose minds are fresh and keen and alert and who keep growing mentally every day of every year. There are many who at eighteen have minds that are like solid cakes of ice—minds that will remain like cakes of ice until they are made to melt by mental exercise.

"If you want to fill the place some day in the ranks of salesmanship that you are dreaming about; if you want some day to earn the income that you are hoping for, don't become a victim of brain freezing. Let your mind, as well as your hands, be at work at your business. Try to size yourself up as other people, especially as your Employers are sizing you up. Dig out your weak spots; set your brain at work to build up these weak spots. Become a thinking animal rather than a mere calculating animal. Resolve to become a leader in your branch of salesmanship. Let others learn to come to you for help, for information and for advice in place of you going to them.

"Don't run away from your problems in salesmanship, be they big or little, but solve them by the exercise of your brain. Keep this God-given gift freshened and brightened up by constant use. Remember that the lot of the dull-witted Worker is to do the dull work that commands only the lowest pay. The quick-witted Worker who uses his wits fairly and honestly is the one who, in time, becomes the dull-witted fellow-worker's boss and who also commands the business world's highest rewards."

Oil Telltale that Interrupts Ignition.

By way of providing an infallible oil level indicator, the manufacturers of the foreign Schneider car have evolved a device which automatically interrupts the ignition current directly the oil level drops to the danger point In its simplest aspect it is nothing more than a small tube containing a float buoyed up by the lubricant. The float carries a contact which comes against another contact, short-circuiting the magneto when the level of the oil becomes lower than normal. Thus, it is impossible to drive the car with insufficient lubricant in the reservoir.

"PAROL" OFFERED BY SOUTH AFRICA IN PLACE OF "GAS"

Substitute for "Petrol" Evolved from Kerosene—American Consul Participates in Test Which Gives Promising Results.

The agitation that has followed upon the heels of the rising price of gasolene has resulted, among other things, in the stimulation of research with a view to the production of a satisfactory substitute for the volatile fluid, and reports of "new fuels" are of almost daily occurrence. One of the most recent of these liquid hydrocarbons is "parol," which was developed in South Africa and is being introduced in Johannesburg, where it is said to be attracting considerable attention because of its excellent qualities as a motor fuel.

Parol is made from kerosene and is produced from that oil without the employment of heat; its cost, measured by South African standards, is 50 per cent. more than kerosene and 25 per cent. less than gasolene. Though it is less volatile than gasolene, reports of tests indicate that it can be used without without difficulty in motors adjusted for gasolene, and greater efficiency is claimed for it than for the lighter fuel. Other advantages attributed to parol are the absence of the strong odor of kerosene and non-sooting qualities.

In a test made with a five-passenger Ford taxicab which was prepared for the trial merely by having the tank emptied of gasolene and filled with parol, a run of 72 miles was made over roads described as being exceptionally hilly, with a full load, the weight of the passengers aggregating 765 pounds. The run, of 36 miles out and back over the same route, was made with only one stop, at the "out" end of the course. The American consul at Johannesburg was a member of the party, and he reports that no tendency toward overheating was observed, the driver, on the contrary, stating that the motor ran cooler than with gasolene, and there was no perceptible misfiring or knocking in the motor. There was no smoke and very little odor. The fuel consumption worked out at 27 miles per gallon. Examination of the spark plugs at the end of the trip disclosed no sooting or fouling.

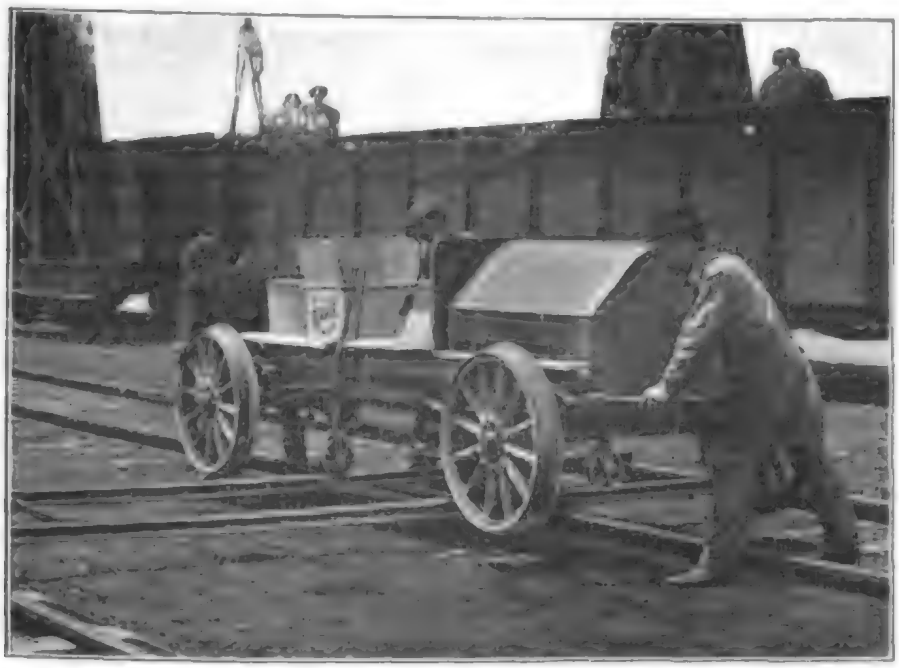
So encouraging have been the various tests of the new fuel—the name of which, by the way, is a combination of the first syllable of paraffin, British for kerosene, and the last syllable of petrol, which is gasolene—that the inventors express the intention of entering the various contests that are being promulgated in England for fuels usable as alternatives to gasolene.

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MOTOR SECTION CAR THAT FACILITATES RAIL LAYING

Pittsburgh & Lake Erie Car Carries Crew and Helps Lay the Rails—Permits Eight Men to Place 1,400 Feet a Day.

The adaptability of the automobile to special work of various kinds is being demonstrated in some new way almost every day, there being, apparently, almost no limit to the number of instances in which work can be facilitated or improved by the use of the machine. Among the more recent plans is that worked out by the Pittsburgh & Lake Erie Railroad for speeding the work of track laying under special conditions.



CONVERTED OTTO CAR WHICH IS USED FOR TRACK LAYING

A special section car, built on the lines of an automobile but, of course, fitted with flanged wheels for running on the track, was built for the railroad by the Otto Gas Engine Works, of Philadelphia, Pa. The motor, placed under the usual hood in front, has four cylinders and is rated at 30 horsepower. The special feature of the machine is the method adopted for removing it from the track after it has been run to its destination. A short bridge, built of light rails, is laid across the main track between the front and rear wheels of the car. A set of special castor wheels on the car is lowered onto the bridge and the weight of the machine transferred to them by an ingenious system of jacking. The projecting end of the bridge is blocked up, the car pushed off, blocking placed under the main wheels and the bridge removed. The car is put back on the track simply by reversing the process.

Track-laying under the special conditions which brought this novel car into existence involves the use of screw spikes, for which holes must first be bored in the ties; afterwards the screws are turned into the holes. In order to eliminate the great loss of time that would ensue if this work were done by hand the car is fitted with a compact electric generator which is housed with the motor under the hood; means are provided for readily connecting and disconnecting the generator from the engine. When the car arrives at the scene of operations and is removed from the track, as already described, the generator is connected with the engine and the engine started up; the current generated is carried through cables to electric boring machines and to electric "screwdrivers" for making the holes and putting in the spikes. The cables are long enough to permit the machines to be worked nearly 1,000 feet from the car. The equipment consists of two boring machines, each operated by two men, and a spike-setter, operated by two men. A gang of eight men—four borers, two spike-setters, an engine man and a foreman—under ordinarily favorable conditions, can do the spiking for about 1,400 feet of track per day.

It almost goes without saying that the car is used also as a little locomotive, being coupled, on occasion, to a special trailer fitted with seats and used for the transportation of men to and from distance construction points. It is possible to save considerable time in this way and the men are saved some fatigue, to say nothing of the fun they get out of the "joy-riding."

NEWER JONES SPEEDOMETERS REVEAL THOROUGH REVISION

Equally Spaced Speed Indices, Larger Figures and Improved Actuating Mechanism Among Refinements—Prices Increased.

Believing that a speedometer—even a Jones speedometer—is not good enough until it is as good as it can be made, the Jones company just has revised its entire line, adding a number of improvements and refinements and, incidentally, increasing the prices in accordance with the higher quality of the instruments. The same number of models is being listed, of the same capacity ranges as the older ones.

Possibly the most important change is in the means for giving the needle a uniform rate of travel over the scale, so that the divisions can be equally spaced. The cam mechanism formerly employed has been replaced by a simpler and equally effective device. The pivoted ring which rotates with the main shaft and which, through centrifugal force acting against a spring, tends to assume a position at right angles to the shaft when in motion, is connected to an arm on the needle arbor by a slotted lever, a pin on the arbor arm engaging in the slot. When the slotted arm swings it carries the pin with it and, of course, moves the needle; but the centers are so placed that the further the slotted arm swings the nearer the needle-arm pin approaches its outer end—which means that the needle moves further, in proportion to the movement of the rotating ring, when the ring is revolving slowly than when it it revolving rapidly and so is more nearly at right angles to its shaft.

The main shaft, carrying the rotating ring, formerly was placed horizontally in the case; it now is in a vertical position, which is considered more favorable to accurate materials and workmanship, there are no other changes in the internal mechanism of the "New Jones."

In the method of transmitting motion from the road wheel to the shaft of the instrument there are improvements in the swivel bracket, which carries the lower end of the flexible shaft, and in the shaft itself. The bracket now swivels on ball bearings, instead of the older plain bushing. Coiled wire shafting has been abandoned in favor of a chain shaft, in which alternate links of square steel connect with "barrel links" which practically fill the space in the casing; the square steel links are hooked into square holes in the ends of the barrel links, the result being that there is an absence of the tendency to slip and twist up that is pres-

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ent when round wire links hook into round holes.

The exterior appearance of the latest models shows that the figures have been substantially enlarged, making it easy to read the instrument even at a considerable distance. A clever little refinement consists in turning on edge that part of the needle which swings over the odometer openings. With the needle of the usual shape, the flat shank partly obscured the odometer figures in some positions; the present form shows but a thin black line.

Considerable attention is being given to the designing of special instruments for cars on which Jones speedometers are used as regular equipment, the finish of the car and the outline of some characteristic part being used as bases for designs. One new set that is being worked out consists of a speedometer, clock and barometer arranged in a triangle on a common base to be sunk flush in the dashboard.

New models are designated according to their prices—model 25, model 50, model 60 and model 75. The old scale of prices ranged from $20 to $60.

Locating a Difficult Radiator Leak.

Locating a leak in a radiator if the hole be small is oftentimes a difficult task because the liquid spreads, due to capillary attraction, over a wide surface around the point from which it is oozing. A good plan is to apply the plumber's "smoke test," forcing smoke into the radiator by means of a tire pump and preventing its escape by any other means than the small hole. The smoke for the purpose is best generated by drawing the air supplied to the pump through a series of wash bottles containing strong ammonia water and hydrochloric acid.

Nut Locking That Is Effective.

A method of locking a nut that sometimes is useful is to drill a hole lengthwise into the end of the bolt, in the center, countersink and tap it for a flathead machine screw, split the bolt through the hole for a short distance and, when the nut is home, put a tight-fitting machine screw into the hole, slightly spreading the spit. It makes a neat and effective job, though it is not practicable in many cases.

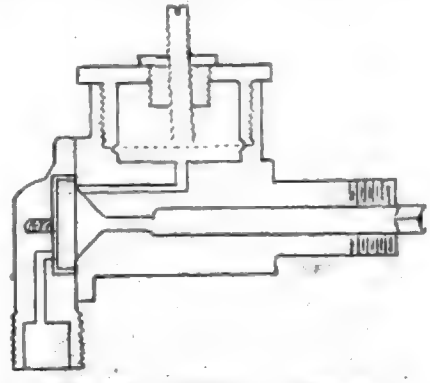
"Soft" Hammer for Finished Work.

A very good "soft" hammer for striking finished work can be made of a common tee pipe-fitting by inserting a handle in the single branch and filling the other two with babbit. The babbit should be poured in and carried beyond the branch ends by temporary molds or collars of sheet asbestos, clay or leather. The filling can be melted out and renewed when it has become worn.

ACETYLENE GAS CONTROLLER SERVES DOUBLE PURPOSE

Obviates Possibility of Lamp Explosions by Acting as Its Own Igniting Spark Switch—Ingenious Diaphragm Used.

In electric lighters for acetylene gas lamps there is a possibility, where the gas valve and the spark lever are operated separately, of leaving the gas turned on too long before switching on the spark, the result being anything from a slight puff to an explosion wrecking the lamp. To eliminate this possibility the Simplex lighter has been brought out by the Simplex Appliance Co., of Indianapolis, Ind., the object sought being gained by making the pressure of the gas itself operate a diaphragm which completes an electrical circuit and causes the igniting spark at a predetermined time.



SIMPLEX IGNITER DIAPHRAGM

The vital part of the apparatus is the gas valve, which is placed on the dashboard with only the stem and key on the driver's side, the valve itself being on the motor side. The accompanying illustration shows the construction of the valve. Upon admitting gas by turning the key the diaphragm is forced upward against an insulated adjustable terminal and a spark is made to jump across the points placed at the burner in the usual way. The points commence sparking before the gas commences to flow, so that the very first gas to issue is ignited and there is no chance of an accumulation previous to the passing of the spark.

The Simplex lighter is made in two models; in one, designated as style A, the head and tail lights are lighted simultaneously by turning the key to the right. In style B a turn to the right lights the head and tail lights, while a turn to the left lights the side and tail lights. In both cases a regulator, attached to the gas tank, reduces the line pressure to four ounces, eliminating the chance of causing leaks through high pressure.

Increasing the Screwdriver's Efficiency.

A screwdriver certainly is a simple tool, one of the simplest in the whole kit—and the idea that there is very little to know about it is a natural one. Nevertheless, there are several ways in which the efficiency of a screwdriver may be affected.

To begin at the beginning—the material of which the tool is made—if the steel is too hard it is sure to break when the tool is subjected to a heavy strain, while too much softness will allow it to bend and the edges to wear, the latter trouble causing the "business end" to slip out of a screw slot at inopportune times.

It is a mistake to suppose that as long as a screwdriver is not actually broken or bent it is in good order. The edge should be straight and square and not rounded off; there should be the very slightest taper at the point, and the thickness should be sufficient to fill the slot of the largest screw for which the driver is used—that is, a screw with a slot of the same width as the end of the driver blade. If the blade is thinner it can, of course, be used for smaller screws, but it will be too weak to hold up under the maximum strain it ought to be capable of withstanding.

Even such a little thing as the direction of the grinding or filing marks on the end of a screwdriver blade makes a difference. If the final grinding or filing is done across the blade, rather than lengthwise of it, the minute ridges will help prevent the blade from slipping when a good, hard pull is taken—especially if the screw slot is a little worn. The difference is real, not imaginary.

There is no use trying to make a single screwdriver fit all the screws in sight and then expect it to be at its best when tackling big, tight ones. The tool kit should include at least three, and if these are kept in good condition the time saved and the satisfaction experienced in using them will be such as to make their possession well worth while.

Missing Caused by Weak Exhaust Spring.

A frequent cause of the motor missing when throttled is a weak exhaust spring which allows the spent mixture to be drawn back into the cylinder on the intake stroke to the detriment of the explosive charge. The malady is best determined by inserting a screwdriver between two coils of the spring when the motor is operating and turning it so as to increase the tension, which will have the effect of causing proper functioning. A repair embraces the fitting of a new spring or, for temporary purposes, stretching the old one.

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DRIVING A DUMP CART WITH BUT ONE MOTOR WHEEL

How a One-Horse Tip Cart Was Converted Into a Front-Drive "Tricycle"—Driver-proof Construction an Essential Feature.

The Third Avenue Railroad Co., which operates no inconsiderable part of the surface car system of New York City, believes in the utility of automobiles and has made use of them in various branches of service — emergency or "hurry-up" wagons, line repair wagons, tool wagons and so on —and foresees the time when horses will be dispensed with entirely. But before the last "hay-motor" can be sent to pasture there are many knotty problems to be solved, and the trolley-car engineers are attacking them one by one, making haste slowly in order to avoid future retrograde steps.

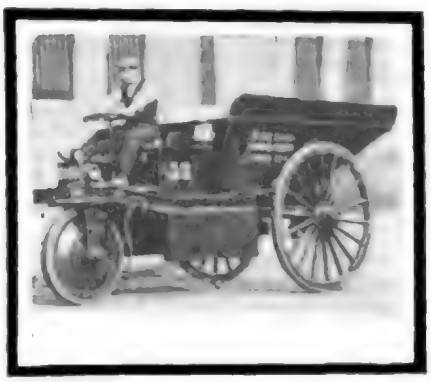
Problems in Need of Solution.

One of the problems of the company has been anxious to solve is that of replacing its little two-wheel dump carts with motor vehicles that will have no drawbacks as compared with the horse-drawn vehicles. The little two-wheelers, capable of carrying about a ton each of ashes or refuse, are substantial, springless affairs, can be turned and maneuevred in an extremely limited space and can be used for a great variety of purposes, carrying rubbish or tools, snow or ashes, coal or castings, and are used all over the city in great numbers. The ordinary type of motor vehicle does not answer the purpose at all, for it occupies too much room, cannot be turned in anything like so small a space, will not stand the treatment that is meted out by the class of men who drive the two-wheelers and who cannot be reformed for a couple of generations (according to the calculations of the engineers) and, last but not least, are too expensive to buy and operate, considering the class of service in question.

How the Chief Engineer Went at It.

It is believed, however, by Chief Engineer Mullaney of the Third Avenue company, that if the "ash-cart problem" has not been solved, a very long step has been taken in the right direction by the evolution of the three-wheeled car shown in the accompanying illustration. The machine consists of a regular dump-cart with a single couple-gear driving wheel pivoted on a forward extension, the drive being effected by an electric motor enclosed in the wheel itself and taking current, through a flexible cable, from a storage battery carried under the driver's seat.

By comparison with the horse cart, the three-wheeler suffers not at all. In the matter of over-all length it is but a few feet longer than the cart alone, not including the horse, and of course is a good deal shorter than the cart and horse measured together. It stands the banging and all-round pounding that the carts endure, and there is no "machinery" in sight to get into trouble through a too intimate acquaintance with water, snow, dust, ashes, tinkering fingers and other things that are not good for working parts. The single driving wheel will take the machine along at from six to seven miles an hour, without load, and from four to four and a half miles an hour with a two-ton load, and will pull that load up the inclines to the dumps on the docks, where ashes and other refuse are loaded into scows; the grade is slightly worse



COUPLE-GEAR ASH CART

than ten per cent. and it is the invariable custom to haul the horse-drawn carts up with the aid of an electric winch.

Comparisons That Are Not Odious.

As to maneuvering in a close place, the machine leaves nothing to be desired. The driving-steering wheel can be turned at right angles to the straight-ahead position, when the wagon can be spun around in its own length and worked in and out in a space where a horse could do nothing. While the horse carts normally carry one ton, it has been found that the three-wheeler will handle double that weight readily—which, incidentally, has led to the undoing of the rear wheels, designed for the lighter loads and the very deliberate rates of progress of the old carts. The machine has been in use for some three or four months, and apart from a few details that are susceptible of improvement owing to the fact that the wagon is the first of its class and was considered an experiment, has given entire satisfaction. Chief engineer Mullaney is only awaiting the result of a more extended period of service before building more of the same kind.

A feature of the machine that is not a little remarkable is that the driving motor has a normal capacity of but three horsepower, though the cart, without load, weighs three tons, or a total of five tons with normal load.

It is a fact that the motor has an overload capacity of 200 per cent., but only for a few minutes at a time, for the heavy flow of current required to develop 9 horsepower would overheat the winding and destroy the motor if long continued. Long trips have been made, carrying two-ton loads over hills and levels, good and bad roads, without overtaxing the little motor. The explanation made by the engineers is that front drive is more efficient than rear drive, in the first place, and that the single wheel involves the minimum of friction, both of the road and of the bearings. The direction of the wheel and the direction in which power is applied always are coincident, eliminating the loss of power involved, in rear wheel drives, in applying power in one direction while the steering wheels are turned in another.

Some of the Structural Features.

The battery used is an old one, borrowed from a pleasure car for the experiment. Several years ago it had a capacity of 110 ampere hours; but its present capacity is unknown. However, it is capable of giving the machine a mileage of about 40 miles an a single charge, which is considerably more than is required. Under ordinary working conditions the current consumption is less than 80 ampere-hours for a day's service.

The wagon is built with a channel-iron frame which is carried forward to a semi-circle over the driving wheel. Riveted to the semi-circle is an extremely heavy cast steel socket bored out to take a correspondingly substantial pivot rising from the fork in which the wheel turns, fork and pivot being integrally cast, also of steel. Steering is effected through a simple set of spur gears and a gear sector on the pivot; the gear works sufficiently easily to permit steering with one hand.

The electric motor driving wheel is the product of the Couple-Gear company and has its armature shaft geared to the wheel internally through a reduction of 25 to 1; the motor remains stationary, being practically integral with the axle, while the wheel rotates around it. In lieu of spokes the wheel has a shell of heavy steel plates, fitted with removable covers through which the motor may be inspected and lubricated. The wheel and the covers are water-tight and dust-proof.

A ball check valve that leaks can be made a tight fit in its seat by tapping it with a light hammer, using a soft metal bar to prevent the marring of the ball.

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FACTORS THAT INFLUENCE FUEL ECONOMY FIGURES

Car and Combustion Knowledge Needed for Low Consumption, Says Franklin Expert—Unheeded Leaks Important.

Economy in the use of gasolene, which does not make such a strong appeal when the vital—from a motor point of view—fluid is sold for a dime and a half a gallon as it does when the price is perching on its present lofty eminence, is the timely topic discussed by Arthur Holmes, chief engineer of the H. H. Franklin Mfg. Co., who commences his discussion with the undeniable statement that economical operation with a six-cylinder car, or, for that matter, any car, may be said to be attained when about 14 miles to a gallon of fuel is the average for a fairly long period of use—which average, however, is in no wise general.

Other Economies Than in Gasolene.

It is not possible, however, according to Holmes, to consider gasolene economy by itself, for, he states, "gasolene economy is but one of the many economies that can and should be worked for on a car. This is one reason why it will never be possible commercially to get the maximum economy of gasolene, as to obtain that maximum, it is necessary to sacrifice a good many other details that lead to a satisfactory car.

"What is possible, however, is very seldom obtained by the average man, no matter what car he owns. This merely indicates that he has not the knowledge of the different things that go to make up economical use of gasolene.

"We believe that every man selling cars should know the points that are necessary to be understood in their operation in order to obtain commercial economy in the use of fuel.

No General Rule That Suits All Cases.

"What it is possible to do, and what *is* actually accomplished by a good many people are two entirely different things, and often you hear of records from five to six miles to twenty miles on a gallon of gasolene. We know that 20 is possible; we know that 5 is possible. We know how to obtain 20 miles on a gallon of gasolene from a car that was giving five miles on a gallon, but we can never tell a man specifically how to do it in his particular case without a study of the actual car and man. However, a study by the salesmen of all the different points that lead toward economical gasolene consumption should help him in helping the owner, and in putting the problem to the future owner.

"In general, if each salesman understood the combustion of fuel in the cylinder, he would have all that is necessary to understand economical operation. He should know that a certain amount of fuel, and this will practically in every case be gasolene, requires air mixed with it in order to have it burn and thus produce power. It is necessary that it should have the correct amount of air, although a little excess of air does very little harm. It is necessary in order to have economical operation that each cylinder have a correct mixture, and this problem is one of distribution. If a perfect mixture were made in the carburetter, distribution would be easy, but in general to-day it is a mechanical mixture of gasolene and air, and the correct distribution of this is not easy.

Ignition Factor in Fuel Saving.

"Ignition is another factor of gasolene economy, and ignition should always be at a point that would give maximum power.

"How a man should drive is another important feature in securing gasolene economy. You can easily see that if the operator is holding out his clutch when going down a hill, and allowing the engine to run under its own power, he is needlessly using gasolene. In fact, every time that the brakes are used on the car and the throttle not closed—and this can happen by holding out the clutch and leaving the throttle open—he is wasting gasolene.

"The average man does not realize the importance of the needle valve. In all cases, this valve should be adjusted to the minimum possible and still have good operation. Adjusting this needle valve to the minimum really means getting the right proportion of gasolene and air, and to-day even in warm weather the gasolene is so hard to vaporize that it is absolutely necessary to use the needle valve under several different adjustments when starting up, and until the engine is well warmed up. In the winter time the valve may be opened up to twice its regular opening in order to get good operation when everything is cold. It is very likely that if the needle valve is not closed down and the motor warms up, from two to three times as much gasolene is used as is necessary.

Leaks Often Source of Heavy Waste.

"Another big source of gasolene loss is in small leaks. Very frequently the gasolene valve or some of the unions leak just a drop now and then, but inasmuch as this drop is going on for 24 hours a day, it amounts to a great deal. For this reason all such places should be examined at regular intervals to note their conditions.

"Touring in the country gives the best possible chance for economical operation, as it allows the motor to be used at a more economical point in its power. At the same time, driving at high speed in the country does not give economical operation, as far as gasolene is concerned, because the wind resistance increases so fast that the amount of gasolene used in covering any particular mileage is very much greater than if that same mileage was covered at a slower speed. Probably 20 miles per hour represents the best speed for economical operation.

One Extravagant Remedy for Leakage.

"Leaks in the suction yoke, and, in fact, anywhere in the gasolene line, affect the quality of the mixture. For instance, if the suction yoke leaks where it goes into one cylinder, the only way to drive and not have popping back in this cylinder is to open the needle valve. Naturally, this affects all the cylinders, and whereas it may correct the difficulty in this one place and get the right mixture, in the other five cylinders it gives a mixture altogether too rich, and for that reason is very uneconomical. Therefore, any leakage at practically any point in the suction line seriously hurts economical operation. This is true also to a certain extent when any valves leak.

"Naturally, the carburetter has a good deal to do with the gasolene consumption, but with a standard carburetter there is not a great deal of difference in its use of gasolene. But there are quite a few things about a carburetter that can produce uneconomical operation, such as leaks in the float or air leaks around the carburetter, and for that reason it is very desirable to give this part enough attention to know that it is clean and in good operating condition.

"Economy in the operation of an automobile is a big factor today. People want to know what is economical operation, as far as actual cost is concerned, and also how to obtain this economy."

Etching on Metal or Glass Surfaces.

Etching can be done on glass, steel or other metal by the following method: Cut a paper stencil of the desired pattern, number or whatever it may be and paste it in place on the surface to be etched. Fasten the piece to the open end of a small box, such as a cigar box if the job is small, with the stencil in, and put into the box a good handful of shot and some coarse emery or corundum. Shake the box so that the shot and emery will strike the surface: the emery will quickly etch the pattern where the paper is cut away. The longer the shaking is continued the deeper will be the marking.

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MAINTAINING EFFICIENCY OF ELECTRIC EQUIPMENT

Fine Points of the Delco Lighting, Starting and Ignition System as Applied to Cadillac Cars Made Plain in a Manner to Assist in Its Care—When and Where to Make Adjustments and How To Go About It.

(This is the twenty-third of a series of articles designed to make clear the electric lighting and engine starting systems in use and to render easier their care and repair by the dealer and owner alike.)

No two engines of different makes are exactly alike in their characteristics, regardless of whether their bores and strokes are the same or not; each has its own idiosyncrasies and individualities. One motor may start very easily and another may start very hard; one may require considerable "spinning" at considerable speed before it can be induced to chug on its own behalf and another may go off "on the first pull up"; some motors require no little power, muscular or otherwise, to "turn them over," and others are so easy to crank that the real power they develop when they get to running regularly may be surprising, judging by the ease with which the crank can be swung around. All of which is fairly well known, of course, and the reason for the difference is not difficult to understand: Compression pressure has a good deal to do with it, the ratio of bore to stroke also has something to do with it, and so has the "fit" of the parts.

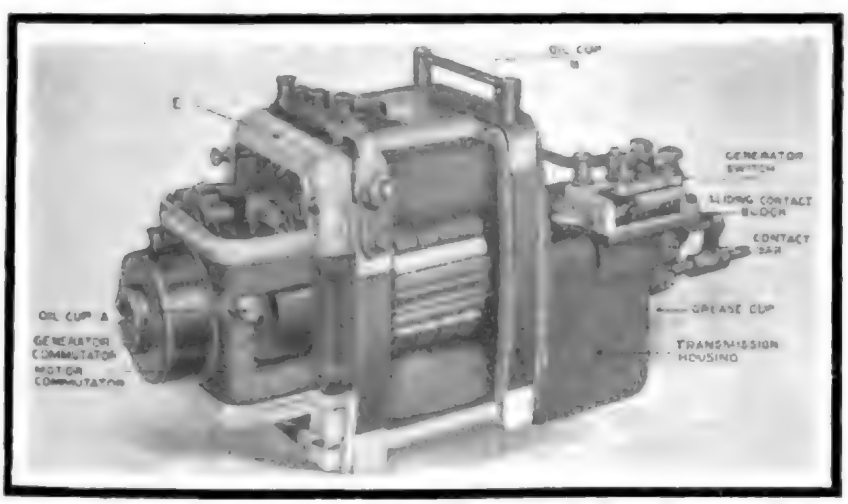
Consequently, it may be appreciated that no little difficulty may enter into the problem of designing and constructing an electric lighting and engine starting system which shall operate with equal efficiency on any engine, regardless of make or size. As a matter of fact, few manufacturers attempt it, though it is only fair to add that those who have attempted it have received a measure of success that should be gratifying.

There is another factor, however, which enters into design and which cannot well be overlooked: No two engines are any more alike in their method of mounting and the disposition of their accessories, if the pump and the magneto and the carburetter may be styled such, than they are in their characteristics. Hence, special means of mounting and driving electric lighting and engine starting systems designed for use with them must be provided; it seldom is possible to take any lighting and starting system and apply it to any engine, and the practice is not very openly encouraged by manufacturers whose experience has taught them that for the greatest all-around efficiency an electric lighting and engine starting system must be designed for a particular engine and must be just as much a part of the engine as the carburetter and the magneto and the water pump or any other part.

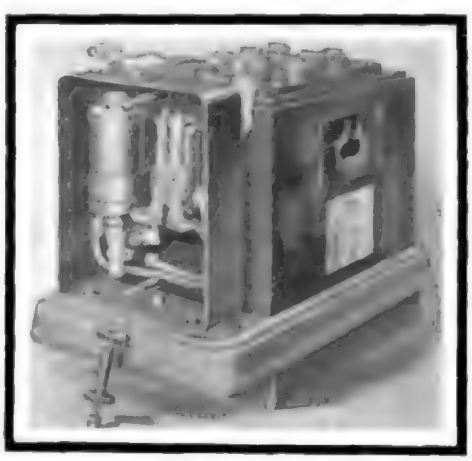
Need of "Built-to-Order" Systems.

In appreciation of all these facts, the Dayton Engineering Laboratories Co. of Dayton, Ohio, which company probably is the pioneer in the combination of electric lighting, starting and ignition apparatus, produces no stock designs. Each Delco system, as applied to Cadillac, Packard, Oldsmobile, Hudson, Cole and others, is a "built-to-order" system and each differs slightly from the other in one respect or another. The functioning of the apparatus as applied to all these cars also differs slightly from the other in one respect or another, due to the constructional details of each, though the principle upon which they all operate is exactly the same. Thus, though a description of one of the systems—the system as applied to the newer crop of Cadillac cars, for instance—will serve to make plain the general features of Delco apparatus, and the principles involved, it will not cover accurately all the systems; allowances must be made for varying construction in the several makes of cars to which it is applied.

In one respect, though, all Delco systems are alike and in that respect the system is radically different from anything else of its kind; there is nothing that even approaches it in design. The combined generator and motor, which is the same for all systems except for a slightly different arrangement of some of the external parts to accommodate it to the different engines, employs what is virtually a double armature. The construction is made plain by the accompanying illustraton, which shows the arrangement of the two commutators and the two pairs of brushes. The double armature, however, is practically solid and, except for the presence of the two commutators, might be taken for a single armature of the orthodox pattern; needless to add, there is no movement between the two parts of the armature.



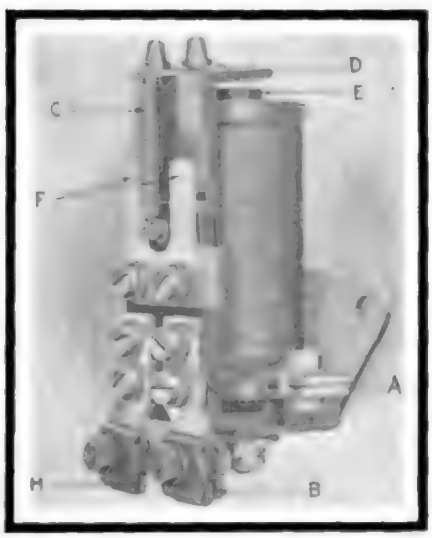
DELCO MOTOR-GENERATOR AS USED ON CADILLAC CARS



BATTERY BOX AND REGULATOR

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When the machine is operating as a motor to start the engine, current is passed to it from the battery through the motor switch, mounted in an integral housing and through the larger of the two commutators and its own separate pair of brushes. As a motor, neglecting the generating function for the time being, the machine is a simple series wound one with a spur gear pinion on the end of the armature shaft. Between this gear and the gearing cut in the periphery of the flywheel there is a pair of gears to give the required reduction of approximately 25 to 1 and a positive one-way clutch to permit the gears to overrun for the short space of time required to disengage the gears after the motor has started. The operation of this part of the mechanism, and of all the other parts, for that matter, is perhaps best made plain by



CUT-OUT MECHANISM EXPOSED

considering the various functions as they take place.

Starting Operations Made Plain.

To start the engine, the spark advance lever first is placed in the center of the quadrant, which operation makes the necessary connections to permit the apparatus to be put to work. The next operation, taken in the order of proceeding, is to depress the button marked "start" in the bank of four buttons that is part of the system. Depressing the button has two direct results, simultaneously obtained. The first of them is that a magnetic latch is energized from the battery and placed in the position for starting, and the second is that a small amount of current is passed to the motor, thus causing the armature to rotate slowly to facilitate the engagement of the starting gears. Then, if the clutch pedal is merely depressed, the one movement suffices to engage the flywheel gears and connect the battery full strength to the motor. Releasing pressure on the clutch pedal (after the engine has started) disengages the flywheel gears and the motor-generator unit then takes up its functions as a generator pure and simple.

The magnetic latch, which is illustrated herewith in section the better to make plain its operation, is one of the important parts of the apparatus and one of its distinctive features. In its simplest aspect, it consists primarily of a small electro-magnet the armature of which forms one of the latch parts (C). The other latch part (B) is directly connected to the clutch pedal. Therefore, the clutch pedal portion is free to move without moving the rest of the apparatus, except when the magnet is energized, when the two parts (B) and (C) are brought into such relation that the one catches on the other, causing the whole device to be moved. As the motor starting switch and the lever that engages the flywheel gearing are interconnected with the clutch pedal through this latch, the operation of the starting motor virtually is controlled through it.

The electro-magnet portion of the device is thoroughly protected from dirt and moisture and is so ruggedly constructed that there scarcely is even remote possibility of it getting out of order. However, it may be necessary after long use to adjust the latch, and for this purpose the adjusting screw (D) is provided. When the latch is properly adjusted the pawl (C) should just pass the arm (B), leaving approximately the space indicated by the arrows when the engine clutch is disengaged and no current is passing through the magnet. The distance between the parts can be decreased by screwing up the adjusting screw (D), or increased by unscrewing the screw.

Connecting Battery and Motor.

The starting switch of the Delco system is unique in that it is designed to perform two functions. It is shown herewith in section, and, as has already been explained, is interconnected with the clutch pedal through the magnetic latch. Beneath the cover of the switch (A) there is mounted a sliding block contact (B) which is mounted on a rod and presses against the conductors in the cover, the free end of the rod (C) being connected to the mechanism which operates the wheel gearing through another rod (D). The sliding contact (B) is not connected to the rod (C) but is forced into its starting and operating positions by collars and a coiled spring (E), which is interposed between the block upon the forward end of the pull rod and a rear collar abutting directly against the sliding block. A small latch (G), engaging with pins on the sliding block, serves to hold it firmly in the forward position.

In practice it will be found that very little attention will be needed in caring for the switch. Dirty contacts will result in gradual slackening of the speed at which the motor is cranked when the battery is fully charged and serves as an indication that the contacts require cleaning. They are accessible by removing the cover (A) and may be cleaned with gasolene. If they are pitted or burned, it is recommended by the manufacturer that they be ground in with valve grinding compound and afterward lightly lubricated with fine oil.

How the Regulator Does its Work.

After the engine has taken up its own cycle of operations, the motor-generator unit automatically is converted into a plain shunt wound generator and without more ado takes up its functions of placing back



DELCO CADILLAC REGULATOR

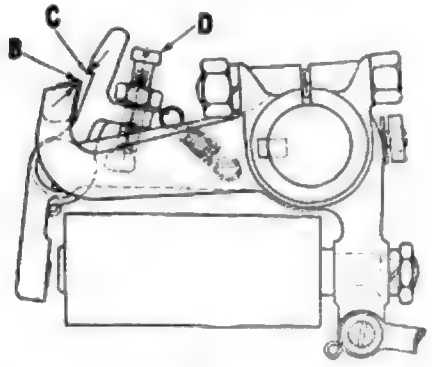
in the battery the current drawn out for starting and for lighting the lamps.

The regulator, which is contained within the battery box, consists essentially of a small solenoid connected in series with the battery. When the battery current is low, the solenoid drops, thus cutting resistance out of the generator field and permitting more current to be generated and passed to the battery. When the battery is fully charged, the solenoid stands virtually at the top of its "pit" when considerable resistance is placed in the shunt field of the generator, reducing the charging current to the minimum. It is comparatively well known that low temperatures necessitate somewhat higher charging rates than do high ones, and these conditions are cared for by a small, variable resistance or rheostat contained within the same housing as the main voltage regulator. Moving a tiny lever to the left, for very cold weather, increased slightly the charging rate without interfering with the operation of the main regulator and moving it to the left, for very hot

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weather, decreases the charging rate. It is unnecessary, however, to alter the adjustment for slight temperature changes.

As is the case with very nearly every other system, the Delco system is equipped with an automatic cut-out, the function of which is to connect the generator to the battery when its voltage is higher than



OPERATION OF MAGNETIC LATCH

that of the battery and to break the connection immediately the generator voltage drops below that of the battery. The device itself consists of an electro-magnet with a compound winding. The voltage, or fine wire, coil is placed in series with the circuit between the battery and the generator through the terminals A and B, and is opened and closed at the contacts F.

Operation and Care of Cut-Out.

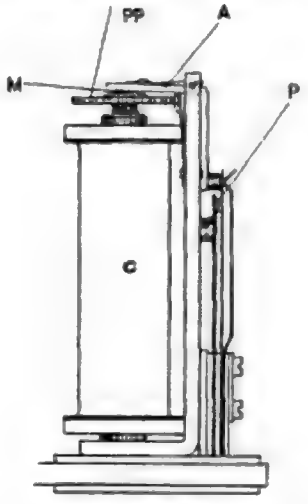
In operation, the tension of the spring (C) is overcome when the generator voltage builds up to approximately six, the armature (D) being attracted to the core (E), thus closing the contacts (F). These contacts, which are in series with the current or coarse wire winding, close the circuit between the generator and the storage battery and the current passing through the coarse wire winding increases the magnetic pull, making more positive the connection. Immediately the battery voltage exceeds the generator voltage, as when the speed of the armature is reduced, the passage of current through the coarse wire winding in the reverse direction neutralizes the pull of the voltage winding, and the spring opens the contacts. As the device is in operation only at long intervals and cannot possibly get out of adjustment, no means of adjusting it is provided.

The Tale the Ammeter Tells.

The ammeter which forms part of the Delco system is mounted on the dash and is particularly useful as a tell-tale to indicate the operation of the system.

After the motor has started and is running at a speed in excess of 300 revolutions a minute, the ammeter needle should swing over to the charge side of the scale indicating the amount of current being supplied by the generator to the storage battery, the lamps, if lighted, or the ignition system, as the case may be. In this respect, it should be remembered that the voltage regulator of the system provides a "taper" charge and consequently, with no lamps lighted, the amount of current indicated by the motor will vary according to the speed of the car and the condition of the battery. If the car is being driven at a high rate of speed and the battery is fairly well exhausted, the needle should indicate the maximum charge, and when the battery is nearly fully charged and the car is driven slowly very little current will be indicated by the meter.

The remainder of the Delco system consists of a battery, discussion of the care and



DELCO IGNITION RELAY

operation of which is outside the province of this article, and a complete dual ignition system comprising a battery timer and a magneto circuit breaker and distributer. The magneto circuit breaker and distributer are orthodox in pattern except that automatic advance of the spark is provided by centrifugal means. The battery timer is similar in construction to the magneto distributer except that the advancing mechanism is manually controlled.

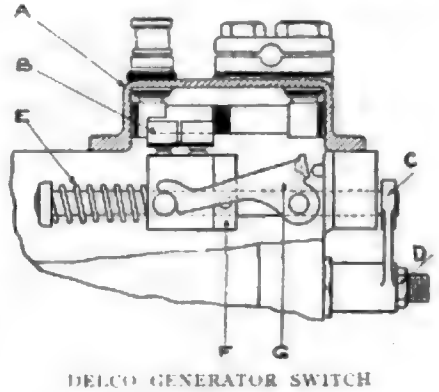
Reason for the Ignition Relay.

Included in the ignition system, there is what is styled an ignition relay, the function of which is to interrupt the primary ignition current from the battery immediately the magneto button is depressed, thus switching the engine from the battery to the magneto. In construction, it is quite similar to the generator cut-out, and is shown herewith in section. When the battery button is depressed, the magnet (C) attracts an armature (A), thus separating the contacts (P), breaking the primary circuit. There are two windings on the magnet, one being of comparatively coarse wire so connected around the contacts (P) as to hold the armature after the circuit through the coarse wire coil is interrupted. If this second coil were not effective, the contacts would vibrate continually, resulting in a shower of sparks at the plug instead of only one spark. The shower of sparks is employed only in starting, which, briefly, explains the reason for the relay.

Adjustments That Are Easily Made.

Actually, the relay is simple in construction and before troubles are attributed to it a careful search for loose or broken wires should be made. There is only one adjustment that can be made, and that is at the pole piece (PP). This regulates the distance between the armature and the pole piece and consequently the size of the gap between the contacts (P). Turning the notched screw clock-wise increases the gap between the contacts, and turning it the other way decreases the gap. Generally speaking, the gap should be just wide enough to permit the passage of a thin busness card. One very good way to adjust it is to turn it counter clock-wise until the motor ceases to fire, after which it should be turned four or five notches the other way. Under no condition, however, should the adjusting screw be turned more than a few notches in either direction.

The bank of ignition switches which forms part of the Delco system consists of four small buttons concentrically arranged about a Yale lock. Depression of the button marked "Start" makes the necessary connections, which result in a shower of sparks at the plugs and should not be used except when starting; under other conditions it is wasteful of current. When the button marked "B" is depressed the dry



DELCO GENERATOR SWITCH

cell ignition system is switched on and the button automatically is released when the "M" or magneto button, connecting the generator ignition system, is depressed. The "Off" button serves to release any of the buttons that may be depressed and at the same time cuts off the ignition current from any source.

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1,027,800. Pneumatic Tire Protector. Cuba A. Belew, San Diego, Cal. Filed Jan. 8, 1912. Serial No. 670,053. (Metal tread designed to give with the tire.) 1 claim.

1,027,808. Automobile Fender. Jayson K. Bond, Milwaukee, Wis., assignor of one-half to Kenneth W. Jacobs, Milwaukee, Wis. Filed Mar. 2, 1911. Serial No. 611,703. (Clamp-on type of fender.) 6 claims.

1,027,866. Shock Absorber. Allen Loomis, Detroit, Mich., assignor, by mesne assignments, to The Packard Motor Car Company, Detroit, Mich., a Corporation of Michigan. Filed Dec. 4, 1908. Serial No. 465,924. (Means for providing increasing resistance when the movement is greater.) 22 claims.

1,027,929. Muffler Cut-Out. Charles Worrell Stryker, Syracuse, N. Y. Filed Oct. 20, 1910. Serial No. 588,055. (Device clamps on the exhaust pipe.) 2 claims.

1,027,936. Indicating Attachment for Tanks. Joseph B. Turner, Cuero, Tex. Filed Dec. 4, 1911. Serial No. 663,684. (Float serves to move the indicating needle.) 4 claims.

1,027,957. Automatic Cranking Device. William H. Withers and Clifford T. Harris, Atlanta, Ga. Filed June 2, 1911. Serial No. 630,958. (Compressed air motor with manually operated valves.) 2 claims.

1,027,978. Automobile Bank Vehicle. David H. Bellamore, New York, N. Y. Filed Aug. 30, 1910. Serial No. 579,707. (Body arrangement.) 4 claims.

1,027,983. Tire. James Bropson, Cleveland, Ohio, assignor or one-half to John A. Mangan, Cleveland, Ohio. Filed May 16, 1910. Serial No. 561,665. (Helical springs between tire tread and wheel rim.) 3 claims.

1,027,999. Tire. Samuel A. Deatherage, Richmond, Ky. Filed May 20, 1910. Serial No. 562,472. (Helical springs enclosed in a flexible casing.) 1 claim.

1,028,009. Differential Gear for Automobiles. Rosman I. Fancher, Baldwinsville, N. Y., assignor of one-half to Frank L. Fuller, Syracuse, N. Y. Filed Apr. 20, 1910. Serial No. 556,581. (Axle driving shafts connected to bevel gear by endless chain which passes over chain wheels on ends of shafts and on a chain wheel on the bevel wheel.) 1 claim.

1,028,109. Vehicle Wheel-Rim. James Ellis Hale, Akron, Ohio, assignor to The Goodyear Tire & Rubber Co., Akron, Ohio, a corporation of Ohio. Filed Nov. 10, 1911. Serial No. 659,575. (Means for clamping demountable rims to wheel felloe.) 2 claims.

1,028,115. Water-Cooling System for Hydro-Carbon Engnes. Russell Huff, Detroit, Mich., assignor, by mesne assignments, to Packard Motor Car Co., Detroit, Mich., a corporation of Michigan. Filed May 20, 1907. Serial No. 374,664. (Means for preventing loss of water by evaporation.) 2 claims.

1,028,128. Power-Transmission Mechanism. Robert C. Mitchell, Mount Vernon, N. Y. Filed Dec. 20, 1901. Serial No. 86,646. (Hydraulic control for planetary gearset.) 26 claims.

1,028,172. Resilient Wheel. James R. Wright, Trenton, Mo. Filed March 2, 1912. Serial No. 681,065. (Composite felloe, the members being attached by interposed leaf springs and suitable levers.) 3 claims.

1,028,185. Shock-Absorber. Charles O. Browne, Norwood, Ohio. Filed Nov. 16, 1911. Serial No. 660,568. (Hydraulic device comprising double diameter cylinder and suitable piston.) 3 claims.

1,028,200. Spark-Plug. Charles C. Eldridge and Edwin J. Beebe, Marshalltown, Iowa. Filed March 20, 1911. Serial No. 615,689. (Spark plug assembly.) 6 claims.

1,028,220. Speedometer. Joseph W. Jones, New York, N. Y. Filed Aug. 7, 1908. Serial No. 447,447. (Means of adjustment.) 4 claims.

1,028,231. Attachment for Vehicle-Lamps. Harry A. Lewis, Chicago, Ill. Filed July 29, 1911. Serial No. 641,236. (Hood attaching to headlight to eliminate glare.) 4 claims.

1,028,271. Lamp-Cover. William T. Phillips, Berkeley, Cal. Filed July 22, 1910. Serial No. 573,236. (Telescoping hood for attachment to headlight.) 5 claims.

1,028,277. Current-Controlling Mechanism for Internal-Combustion Engines. Lewis T. Rhoades, Mont Clare, Pa. Filed Sept. 16, 1911. Serial No. 649,631. (Quick break device for coil ignition circuits.) 16 claims.

1,028,304. Fuel-Oil Filter. Joseph Remi Tourangeau, Windsor, Ontario, Canada. Filed March 20, 1911. Serial No. 615,512. (Trap provided with suitable strainers to prevent the passage of dirt into the fuel line and a tap at the lowest point for draining off sediment and water.) 1 claim.

1,028,331. Vehicle-Tire. William J. Cunningham, Philadelphia, Pa. Filed May 23, 1911. Serial No. 628,959. (Suitable springs between wheel felloe and rim which mounts a solid rubber tire.) 2 claims.

1,028,334. Puncture-Proof Tire. McRoy De Viese, Fresno, Cal. Filed Oct. 7, 1911. Serial No. 653,392. (Pneumatic tube mounted in a protective telescoping casing which is provided with a solid rubber tread.) 3 claims.

1,028,347. Variable-Speed Planetary Gearing. Emil Gnoeth, Madisonville, Ohio. Filed July 3, 1911. Serial No. 636,586. (Planetary arrangement which provides three-speeds in one direction and one reverse speed.) 13 claims.

1,028,359. Means for Cooling Gas-Engines. Chester Charles Jones, Beatrice, Neb. Filed March 5, 1909. Serial No. 481,274. (Under surface of the piston of two-cycle motor provided with cooling lugs with which the mixture contacts when passing into the cylinder.) 1 claim.

1,028,400. Shock-Absorber. Horace B. Stanton, Boston, Mass. Filed Aug. 8, 1910. Serial No. 576,066. (Cylinder containing liquid which is permitted to pass from one side of piston to the other by means of a constricted passages.) 7 claims.

1,028,442. Gearing. Joseph Dain, Ottumwa, Iowa. Filed Nov. 7, 1908. Serial No. 461,568. Renewed July 3, 1911. Serial No. 636,708. (Friction type of gearing with double plates set at an angle to each other.) 30 claims.

1,028,451. Reversible Hydraulic Transmission. Peter English, San Francisco, Cal., assignor to Milton P. Ropp, San Francisco, Cal. Filed July 21, 1910. Serial No. 573,090. (Liquid filled casing containing wheels provided with wings.) 1 claim.

1,028,501. Road-Engine. George B. Selden, Rochester, N. Y. Original application filed May 8, 1879. Divided and this application filed Sept. 7, 1895. Serial No. 561,733. (Motor mounted on front axle, which is silod, steering being accomplished by turning the whole axle on a central pivot.) 21 claims.

1,028,514. Igniter or the Like. Walter C. Westaway, Chicago, Ill., assignor, by mesne assignments, to Chicago Pneumatic Tool Company, Chicago, Ill., a corporation of New Jersey. Filed July 16, 1909. Serial No. 507,894. (Means for supporting the electrodes and the insulating material.) 3 claims.

1,028,522. Variable-Speed-Transmission Device. Frederick T. Adams, Victoria, British Columbia, Canada. Filed Aug. 14, 1911. Serial No. 643,896. (Hydraulic transmission comprising suitable compressing cylinders with suitable controls for varying the movement of the liquid.) 6 claims.

1,028,656. Pneumatic Hub. Norman E. Andrie, Centerville, Md. Filed Oct. 31, 1911. Serial No. 657,758. (Hub comprises an inflated bag, rigidity being obtained by suitable telescoping members.) 1 claim.

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Stock Champion International Champion

National 40

The Last Analysis—What Owners Say

"I have given my National car very severe tests and have found it absolutely satisfactory in every respect."

"I am free to say that I never had a car that gave me more real satisfaction than my National car has."

"This is the fourth car I have owned, but the National is the first car with which I have known the real pleasures of motoring."

"The National is as represented and has given me the best of satisfaction."

"It is a car of exceptional riding qualities. The National car is the one for those whose recreation is touring."

"The factory service is all that could be asked."

"If at any future time I purchase another car, it will be another National."

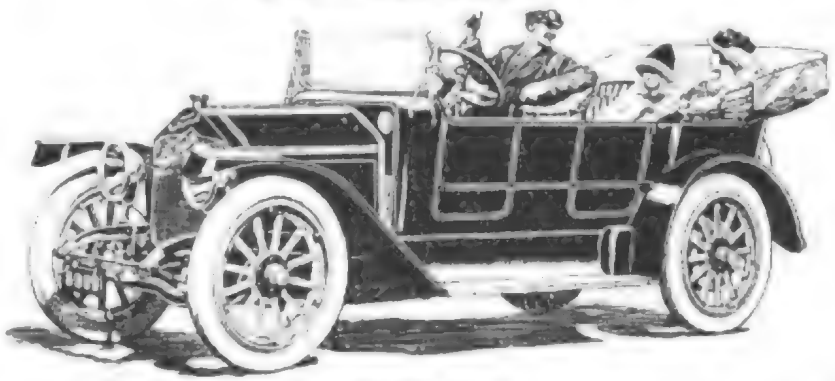
"I do not think that it is possible for me to buy anywhere in the United States, at any figure, any car that would give me any better satisfaction than I am getting from my National car."

"The car is satisfactory in every respect. Extreme flexibility and ample power make it a pleasure to drive this car; and after twelve years' experience in driving I appreciate the quality as well as the quantity of performance this car is capable of giving."

"My National 40 touring car is giving excellent satisfaction and seems to me to be all that could be desired in a first-class dependable machine."

Names furnished on request. Write for book of letters from National owners.

Five Models, $2750 to $3400



National Motor Vehicle Co., Indianapolis, Ind.

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Boss Rubber Co., Denver, Colo.
Southern Hdwe. & Woodstock Co., Ltd., New Orleans, La.
Savell Davis Rubber Works, Augusta and Savannah, Ga.
Boeing Tire & Rubber Co., Houston, Texas
Gold Rubber Co., New Haven, Conn.
Allentown Tire & Supply Co., Jacksonville, Fla.
C. D. Frankle & Co., Charleston, S. C.

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At Boston Automobile Show

259 Cars Were Exhibited With ELECTRIC LIGHTING or STARTING or Both.



Storage Batteries

were installed on

184

showing that

71.5%

of the manufacturers who exhibited have selected the GLBA because of its superior merit.

GLBA SUPREMACY Was Demonstrated at the Three Big Shows as Follows:

New York	277 Cars Exhibited	188 with GLBA Batteries	67.9%
Chicago	242 Cars Exhibited	185 with GLBA Batteries	76.4%
Boston	259 Cars Exhibited	184 with GLBA Batteries	71.5%

Use the Class A GLBA Battery with an Electric Lighting Generator
Use the Class B GLBA Battery with an Electric Self-Starter

Write us for full information

Willard Storage Battery Company

CLEVELAND, OHIO

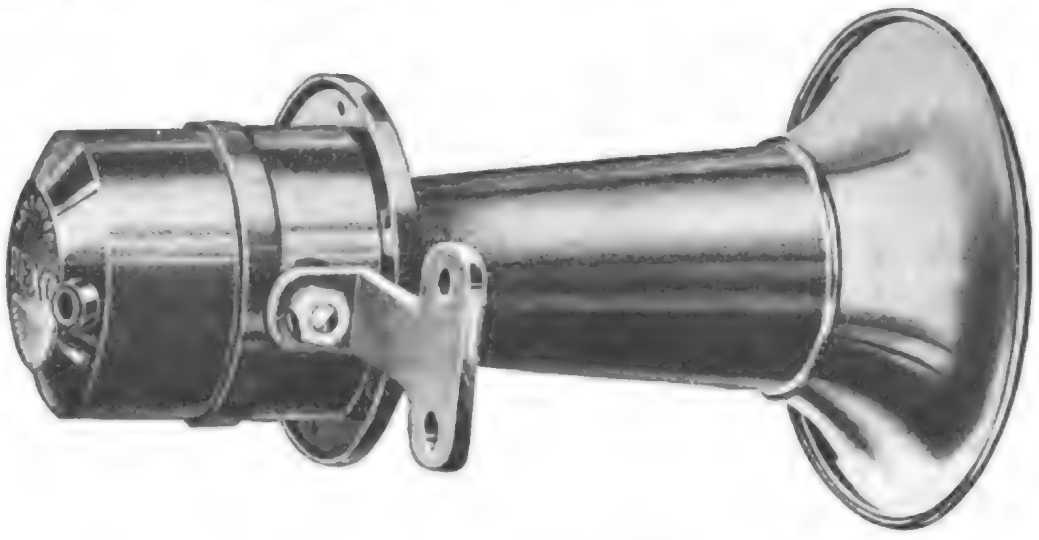
New York Branch—136 West 52d Street
Detroit Branch—1191 Woodward Avenue
Chicago Branch—2241 Michigan Avenue
San Francisco Branch—243 Monadnock Bldg.

Depots in All Principal Cities in the United States, Canada and Mexico

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Elyria-Dean
TRADE MARK

REXO



A "Standard Equipment" Horn

The Electric Warning Signal will be standard equipment on practically every automobile marketed in 1913, and most of the earlier models will be brought up to date by the installation of an efficient electric horn by the car owner. We know this to be a fact, for our mammoth sales of the Rexo, Tuto and Tuto-ette Electric Horns to automobile manufacturers and jobbers is the most conclusive evidence.

45,000 Rexo Electric Horns of special design are specified by one car maker, the largest electric horn order ever placed.

We have already sold over 75,000 Rexo Horns for 1913 cars. When you see a Rexo on a car it means that the maker of that car is willing to hitch up his car's reputation with the Rexo reputation and take our word for it—every car carrying the Rexo is a good car.

The many car manufacturers who will use the Rexo as standard equipment for 1913 are not doing so because of our advertising, but—knowing that to some extent a car is judged by its accessories, they put the Rexo through most gruelling tests and then adopted it because it made good in actual service, was attractive in appearance and required no attention from the user.

The Rexo is made in the same factory and has features which have made the Tuto Horn so successful. The Rexo has a single tone of uniform intensity. The horn is instantly responsive and can be relied upon under all conditions. It is free from constant care and is most effective for emergencies, yet is not too loud for regular service. Our mammoth output makes a low price possible—complete with button and cord, $8.

Elyria-Dean Products Manufactured Only By

THE DEAN ELECTRIC COMPANY
ELECTRICAL APPARATUS
501 Olive St., Elyria, Ohio, U.S.A.

"Look for Elyria-Dean Where Quality's Seen"

Elyria-Dean
TRADE MARK

The TUTO—The Driver's Safeguard



The Tuto two-tone horn safeguards the pedestrian, the occupants of other cars and the driver who operates it.

The Tuto Horn is a complete signalling system, It electrically transmits two different and distinct sounds through a horn—one low and mild, the other loud and penetrating. The degree of sound is regulated by the pressure of your thumb upon the button located upon the steering wheel.

This horn is built upon modern electrical principles in everyday use on thousands of telephones throughout the world. It is reliable, positive-certain.

It can be connected to any ordinary 6-volt battery. It uses very little current because it is not necessary to use the powerful danger tone, except in an emergency, the lower tone being sufficient for the ordinary polite request.

Tuto Horns have many advantages to be found nowhere else. They are:

SIMPLE—No revolving parts; nothing to require lubrication or attention.

WATERPROOF—Water in a Tuto Horn from rain or washing the car, doesn't affect it at all. Water in a motor-driven horn puts it out of commission. It is, of course, dust-proof.

ECONOMICAL—The Tuto Horn consumes but little current.

INSTANTANEOUS—You don't have to wait for the Tuto to "get under way." Pressure on the button brings complete instantaneous response.

GUARANTEED—The Tuto guarantee is "for life" and we live up to it. The horns are substantially built, of the highest grade material. They last.

Finished in polished brass, polished nickel, plain black enamel, black enamel and brass, or black enamel and nickel. Furnished complete and ready for easy installation. Price, $25.00.

Elyria-Dean Products Manufactured Only By

THE DEAN ELECTRIC COMPANY

Kansas City, Mo. **501 Olive St., Elyria, Ohio, U.S.A.** **San Francisco, Cal.**

"Look for Elyria-Dean Where Quality's Seen"

R-C-H "Twenty-Five" Completely Equipped $900 F. O. B. Detroit

THE CAR

Wheelbase—110 inches.

Motor—Long-stroke, four cylinders cast en bloc; 3¼ in. bore, 5 in. stroke. Two-bearing crankshaft. Timing gears and valves enclosed. Three-point suspension.

Steering—Left Side. Irreversible worm gear, 16 in. steering wheel. Throttle control on steering column.

Control — Central Lever operated through H-plate integral with universal joint housing just below. Hand lever emergency brake at driver's right. Foot accelerator in connection with hand throttle.

Springs—Front, semi-elliptic; rear, full elliptic and mounted on swivel seats.

Frame—Pressed steel channel.

Axles—Front, I-beam, drop-forged; rear, semi-floating type.

Transmission—Three speeds forward and reverse; sliding gear; selective type.

Construction—Drop-forgings wherever practicable; chrome nickel steel used throughout all shafts and gears in the transmission and rear axle; high carbon manganese steel in all parts requiring special stiffness.

Bodies—Touring car, full five-passenger English type; extra wide seats. Roadster, two passenger, English type.

EQUIPMENT

Tires—32x3½.
Large gas headlight with Prest-O-Lite tank or generators; oil side and tail lamps. Electric lighting outfit by special arrangement.
High-grade magneto.
Stewart speedometer.
Demountable rims.
Extra rim and holder.
Tally-ho horn.
Jiffy curtains—up or down instantaneously.
Top and top cover.
Windshield.
Tool kit, Jack, Tire repair kit, Pump.
Robe rail.

A CAR which makes good in its first season cannot help but be a bigger success in the second. So it is with the R-C-H "Twenty-Five." We delivered 7,000 R-C-H "Twenty-Fives" last year; this year our output far exceeds that of last.

And the efficiency of each individual R-C-H "Twenty-Five" is increased this year in like ratio. The car is perfectly developed—fit for the hardest kind of service anywhere. Every single mechanical part of the chassis has been proven and tested. It is a stronger, better R-C-H "Twenty-Five" than ever.

The confidence of the public in the R-C-H "Twenty-Five," the R-C-H factories and the men behind both, is marked by increased orders and contracts from every section of the world. We have contracts at this date calling for $12,000,000 worth of 1913 R-C-H "Twenty-Fives"; the distributor for Great Britain asks for one thousand cars, and there is not one automobile-using country under the sun in which the R-C-H is not selling, today. Representatives in no less than forty-two foreign countries have orders on file.

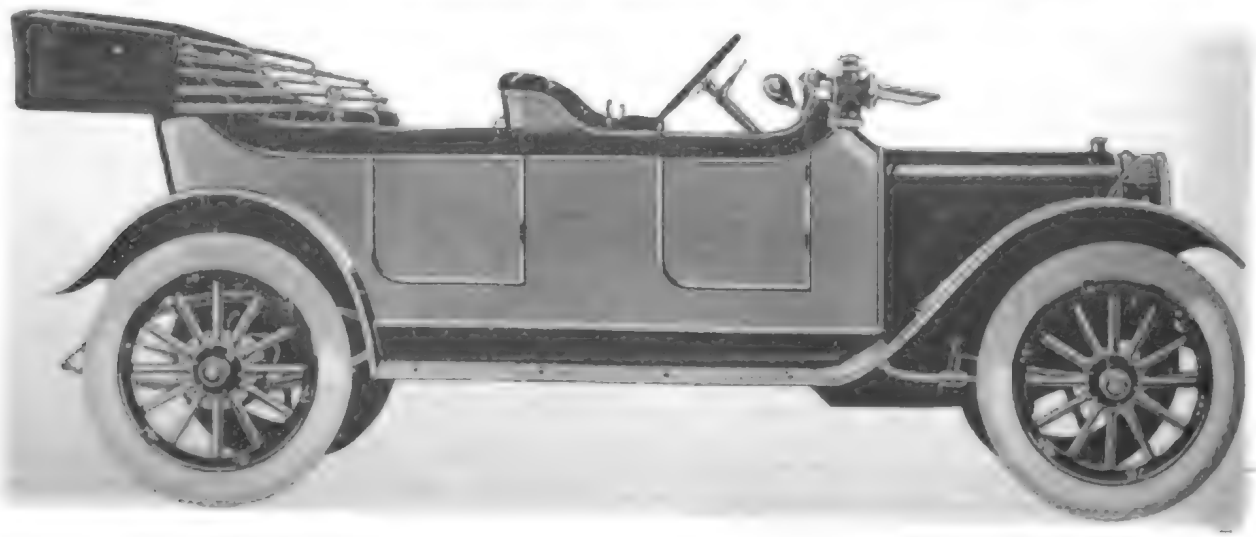
In short, the strength, stability and thoroughness of the R-C-H Corporation and its production system is typified in the quality of the 1913 R-C-H "Twenty-Five."

We cannot promise to take care of you in the Spring rush—unless we get your specifications now. Write us today.

R-C-H Corporation

704 Lycaste Street **Detroit, Michigan**

Represented by Branches and Distributors in All Cities of the World



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NEW DEPARTURE BALL BEARINGS



Standard on 80% of 1913 Cars.

American Made for American Trade

The increasing use of ball bearings in motor cars is easily explained.

Manufacturers are not now required to buy ball bearings abroad. The New Departure has proved satisfactory in service, possesses all of the quality essentials and in every respect is an American masterpiece.

It is more completely anti-friction than any other type—the cost to operate the car mounted on these bearings is consequently less.

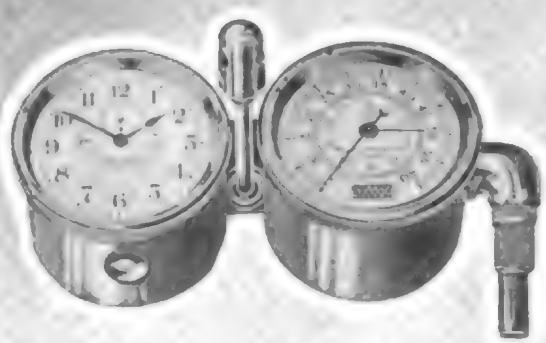
It is ten times as efficient as a roller bearing under same load conditions.

At the Boston Show, Space No. 430, Balcony, each of the three types of New Departure ball bearings will be shown, in slow action, with sections cut away for demonstrating anti-friction and other qualities.

Ask for copy of "Friction and Its Elimination"—a treatise on comparative efficiency of all types of bearings—just from the press.

THE NEW DEPARTURE MANUFACTURING COMPANY
BRISTOL, CONNECTICUT
Western Branch: 1016-17 Ford Building, Detroit

Double Row
Single Row
"Radax"



HOFF SPEEDO

STANDARD EQUIPMENT

NO higher recommendation could be bestowed upon any accessory, for the Lenox people have a reputation for building cars of a quality that makes for performance and general all-round efficiency.

The engineers of the Lenox Motor Car Company, selected the Hoffecker Speedometer to go on 1913 Lenox cars, after an exhaustive investigation, in which our speedometers proved their superiority in scientific construction, refinement in mechanical detail and artistic appearance, the first two qualities presupposing and guaranteeing great service and long life, the latter adding materially to the artistic details of the car.

This speedometer, which we want you to recommend to the prospective buyer and to specify on the cars you sell, embodies many exclusive features, including a daily trip, which can be easily

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ECKER METER

ON 1913 ENOX Car Output



and quickly set to any desired mileage---a fractional mile register ---a hand that remains steady, regardless of the vibration or the speed of the car.

You, Mr. Dealer, can specify a higher priced speedometer, but you cannot specify one with any single "different and better" feature. We put less money than others into advertising, and more into materials and workmanship. Your customer gets the excess quality.

It stands to reason that you want the best equipment possible on the cars you sell. It follows, then, that when you specify the Hoffecker Steady-Hand Speedometer, you are putting on an instrument that goes a great way toward making a good car still better.

HOFFECKER CO., Boston, Mass.

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Accident Prevention

The *Prevention of Industrial Accidents* is receiving universal consideration by thoughtful employers.

The Travelers Insurance Company

affords its compensation and liability policyholders not only the most complete coverage based on an unequal experience and backed by great financial resources, but also

SERVICE

through *Inspection and Safety Engineering*, which is the result of over twenty years' experience and scientific organization along both special and general lines and is the most efficient in the world.

The prevention of accidents has a most important bearing on the cost of compensation and liability insurance.

If you believe with The *Travelers*

An Injury Prevented is a Benefaction
An Injury Compensated an Apology

fill out the coupon below and we will indicate how you may avail yourself of *Travelers' Service.*



Travelers' Gold Medal
awarded by
American Museum of Safety

To Those Foremost In Protecting Workmen.

1910
United States Steel Corporation

1911
Pennsylvania Railroad

1912
New York Edison Company



The TRAVELERS INSURANCE CO., Hartford, Conn. *Motor World 1.*

Please furnish details respecting coverage and service.

Name ..... Address .....

Business ....

Google

U.S. Army Takes No Chances With Jackshaft Brakes

SHELDON
Double Brakes On Rear Wheels
Pass Government Specifications



Chief of Quartermaster Corps, of War Department, Issues Specifications for Motor Trucks for Army Use:

"**Brakes**—Two sets, both attached to rear wheels; one set operated by pedal, other by lever."

¶ **Sheldon Double Brakes on Rear Wheels** meet the Government specifications.

¶ **Equip Your Trucks With Sheldon Double Brakes** and bid on the **Army Trucks.**

¶ **Army Takes No Chances With Jackshaft Brakes,** by demanding that all **Army Trucks** be equipped with both brakes on rear wheels.

¶ **Jackshaft Brakes** are no stronger than the chains. Could you skid the wheels and stop your truck if the chains broke or jumped off the sprockets??????

¶ **You Can Not Depend** on jackshaft brakes skidding the rear wheels.

¶ **Either One of Sheldon Double Brakes Will Do It.**

SHELDON AXLE CO., Wilkes-Barre, Pa., U.S.A.

Chicago Branch—68 East 12th Street
Detroit Branch—1215 Woodward Avenue
San Francisco Branch—444 Market Street

Stewart Speedometer
MAGNETIC PRINCIPLE

The Rise and Victory of The Magnetic Speedometer

Over 95% of all the speedometers to be made during 1913 will be built on the practical magnetic principle

Increase of the Magnetic Type

10% of the speedometers made 5 years ago were magnetic
15% of the speedometers made 4 years ago were magnetic
50% of the speedometers made 3 years ago were magnetic
70% of the speedometers made 2 years ago were magnetic
85% of the speedometers made 1 year ago were magnetic

208 out of 214 automobile manufacturers are now using the magnetic speedometer

The Stewart Speedometer Factory

1949 Diversey Blvd., Chicago, U. S. A.

International Service

Service Stations In All Principal Cities All Over The World

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vs. the Centrifugal Speedometer

The Decline and Fall of the Centrifugal —or Gyroscopical—Speedometer

Only 5% of all the speedometers to be made during 1913 will be built on the obsolete centrifugal or gyroscopical principle

Decrease of the Centrifugal Type

90% of the speedometers made 5 years ago were centrifugal

80% of the speedometers made 4 years ago were centrifugal

50% of the speedometers made 3 years ago were centrifugal

30% of the speedometers made 2 years ago were centrifugal

15% of the speedometers made 1 year ago were centrifugal

Insist on a Stewart (magnetic) Speedometer on your car
It means satisfaction and service

The Stewart Speedometer Factory

1949 Diversey Blvd., Chicago, U. S. A.

International Service

Service Stations In All Principal Cities All Over The World

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An Active Journal Covering an Active Field

Things are happening every day in both motorcycling and bicycling and every week these happenings are accurately reported in the pages of this paper

THE OLDEST AND MOST INFLUENTIAL CYCLING JOURNAL IN THE WORLD

THE BICYCLING WORLD (FOUNDED 1877) and MOTOCYCLE REVIEW

Published Every Tuesday

10c. a copy $2.00 a year

Sample Copy Sent Free on Request

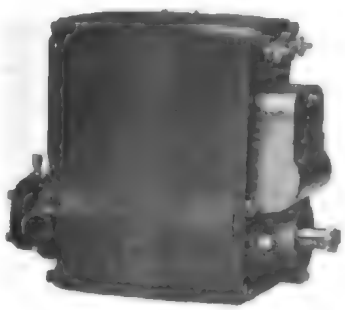
Bicycling World Company
1600 Broadway
New York City

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WESTINGHOUSE ELECTRIC

IGNITION LIGHTING AND STARTING

These Systems
Will Be Found on
Many of the Finest Cars
The Systems Using a Single Wire With a Ground Return



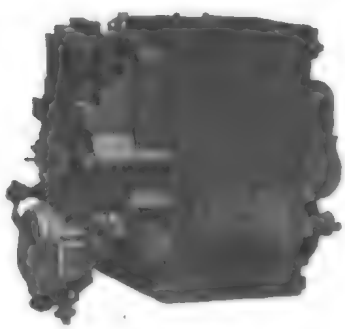
Lighting Generator



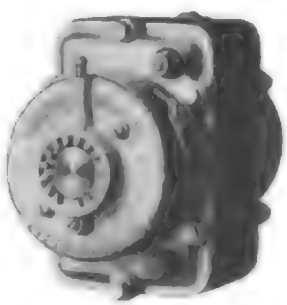
Ignition Coil and Switch



Illuminated Dial Voltmeter



Combined Ignition and Lighting Generator



Starting Motor

Lighting—Westinghouse Lighting Generators automatically charge the battery without the use of any relays, or solenoid-operated regulators. There are no adjustments to be made. The battery is at no time charged at an excessive rate. The generator is slow speed, eliminating noise and wear.

Ignition—A high power, single-unit coil, acting in conjunction with timing and distributing parts on the generator, furnishes high voltage for the spark. The battery operating alone, or with the generator, supplies continuous power. The interrupter gives automatic spark advance. The spark is uniform, regardless of speed.

Starting—Minimum weight of motor and minimum discharge of the battery are features of the Westinghouse Starting Motors, permitting the use of a smaller battery and smaller charging generator.

Illuminated Dial Meters—Three inches in diameter, with black dials and white lettering to avoid glare. The lamp throws light on the dial only, no direct rays being visible. Ammeters or voltmeters supplied, but voltmeters used for standard equipments.

The Westinghouse Company has adopted the grounded system of car wiring, **using a single wire with a ground return.** The wiring is simplified; one-half the usual amount of wire is required; better insulation is secured; proper current carrying area is possible; installation cost is lowered; and troubles are reduced to a minimum. Complete parts are supplied for this grounded wiring, including lamp connectors and incandescent lamps with the **Center Contact.**

Electrical equipment that is the product of the Westinghouse Company, and backed by its long established reputation, warrants the consideration of every motor car manufacturer.

Westinghouse systems are proving the strongest talking points on high-grade 1913 cars.

Westinghouse Electric & Manufacturing Co.

EAST PITTSBURGH, PA.

You Need This New Product—

It Heals Tire Cuts



The Motorist's Self-Vulcanizer

Unlike ordinary tire repair mastic

Fills the cuts and holes, solidifies quickly and becomes like a part of the tire. No car owner can afford to be without it. Reduce tire expense fifty per cent.

Use

NARCO TIRE CUT FILLER

Requires no Kneading

Very large tube one dollar.

a non-shrinking, rubber compound, heavy in rubber; a combination cement, cut filler and mastic. Refills and unites the torn place in the tire with a permanent plug of rubber more resilient than the tire itself. Welds the loosened tread to the canvas body. Supplied only in patent, collapsible tubes, with tapering spout.

Easy to Use

All you have to do is to clean the cut out thoroughly with gasoline—remove all oil, sand and other foreign matter; insert the tapering spout into the cut and compress the tube, smooth off the cut filler and the repair is complete. Narco Tire Cut Filler becomes like a part of the tire. Rests itself to the walls of the cut, forming a union so perfect no road abuse can remove it.

This is the logical manner of tire repair. Every automobile owner in America should make Tire Cut Filler a part of his repair outfit and begin saving in tire cost now. Very large tube, $1.00. Money refunded if not satisfactory.



TIRENEW

waterproofs the outer rubber casing of the tires and penetrates down to the inner fabric, protecting it from oil, air and moisture. Preserves the tires and prevents decay. Spread it over the surface of your tires after mending with Tire Cut Filler. *Makes tires look like new.*

There are imitations which paint but don't protect—insist on Tirenew.

Narco Rubber Reviver and Refinisher

a reviver, refinisher and waterproofer for anything rubber or fabric. Make your auto-tops like new.

Narco Triple-Strength, Non-Inflammable Rubber Cement

A rubber cement three times as strong as ordinary cements, and costs no more.

ALL GOOD DEALERS CARRY NARCO PRODUCTS OR WILL GET THEM FOR YOU

To Dealers—Write for the Narco catalog telling all about the complete line of Narco products and don't fail to ask for our trade proposition. We will give you complete information together with our catalog if you will write us mentioning your jobber's name.

NATIONAL RUBBER COMPANY

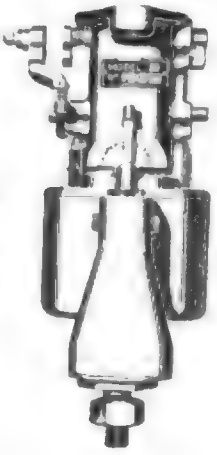
4413 PAPIN STREET. ST. LOUIS, MO.

National Rubber Co. 4413 Papin Street, St. Louis.
Gentlemen: Enclosed find $1.00 for which please send me prepaid a large tube of NARCO TIRE CUT FILLER.
Also please send me information regarding Tirenew and your other Narco Products
Dealer's name
Jobber's name
Address
My Name
Address

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"A Giant in Power"

FEPS CARBURETOR



End View of the Feps

JUST now when the price of gasoline makes it an expensive luxury while its quality grows steadily worse, the subject of carburetors is brought forcibly to the front. Practically every other undesirable feature of motoring has been overcome, every other inefficient part perfected—but carburetors remain the one "big worry" to the automobile owner.

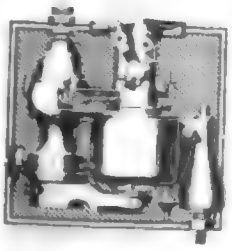
But—there is a way out.

Equip your car with a Feps Carburetor. Experience the peace of mind that comes only with the knowledge of absolute certainty; learn for the first time the real efficiency of your car.

The Feps contains no springs, cams, balls or reeds, it will increase the power and speed of your motor in an astonishing degree, making it intensely sensitive to the slightest movement of the throttle. It will give a perfect gas mixture at all speeds and with any grade of gasoline, and with all this it will give you 25 to 50 per cent increase in mileage per gallon of fuel. It also embodies a never-failing quick starting device.

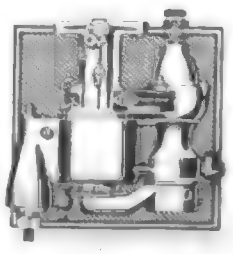
We are well aware that these statements sound impossible to the average motor car owner. That is why we ask you to try the Feps on your car at our risk.

Write Dept. "F" for Descriptive, Illustrated Booklet



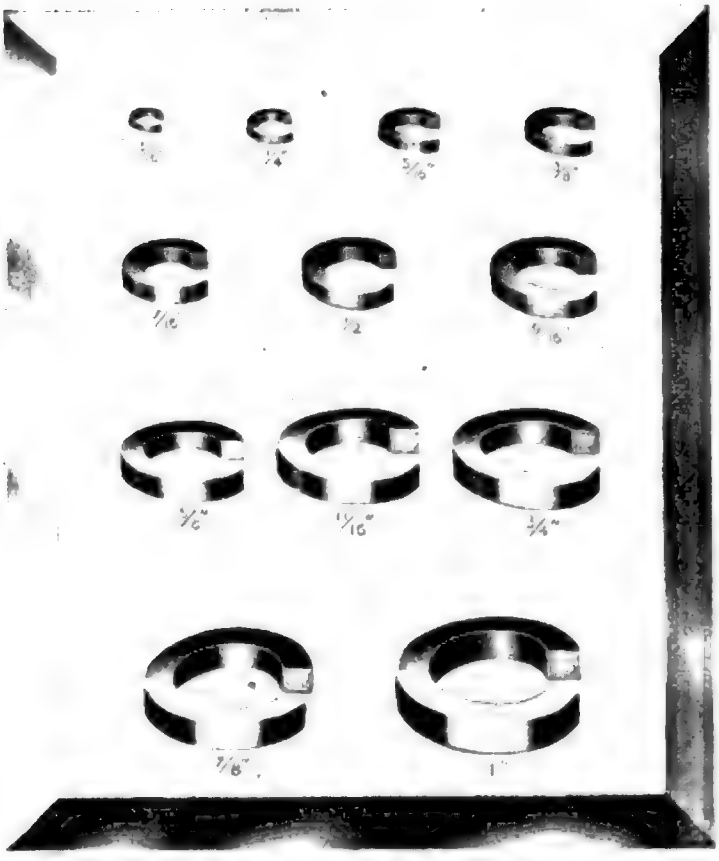
Schoen-Jackson Company

Media, Pa.



"A Miser in Fuel"

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ONE HUNDRED AND FIFTEEN MILLION LOCK WASHERS

What better evidence can we offer of the superiority of NATIONAL LOCK WASHERS than this enormons annual output?

Our standard is the highest in the world—a well earned standard backed by Quality of Product, Abundance of Resources, and Service that Counts.

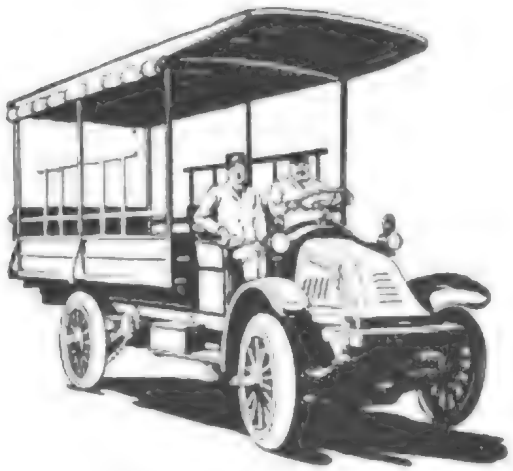
We would offer more if we could.

NATIONAL LOCK WASHERS are not always the cheapest but are unquestionably the Best.

THE NATIONAL LOCK WASHER COMPANY

CHICAGO, ILL. NEWARK, N. J.

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We Will Help You Sell Kelly Trucks

The policy of our company is to help our dealers as much as we can. We do not do this for philanthropic reasons. We do this because we know that the more money you make for yourself, the more money we make.

KELLY
TRUCKS

are being sold in large numbers in all parts of the country. The indications are that we shall be over-sold this year.

We have a good money-making proposition for you. Let us tell you. Write or wire us immediately.

The Kelly-Springfield Motor Truck Company

1032 Burt Street, Springfield, Ohio

The Ward Leonard System

No car complete without it



The completely equipped car of the future will as surely have a reliable and efficient lighting and starting system as it will have tires.

The motoring public has been educated to demand electric lighting and starting, and its demands can be easily and satisfactorily met by the installation of the WARD LEONARD SYSTEM. Motorists want electricity to light and start their cars. Manufacturers have always desired to give it to them, but they have failed because they have absolutely missed the connecting link between satisfactory lighting and starting, and the automatic control of the output of the dynamo.

It is this control of the dynamo that gives the WARD LEONARD user satisfaction with his lighting and starting outfit. We use a shunt-wound dynamo for lighting and a series motor for starting. Every electrical engineer knows that the use of these two standard devices, not joined in the same unit, represents the height of electrical experience and judgment.

No guess work about the WARD LEONARD SYSTEM. Its electrically operated switch controls the amperage with absolute regularity, regardless of the speed of the automobile.

Engineers the world over have endorsed the WARD LEONARD design. Satisfied users in all parts of the earth testify to the practical perfection and the unerring operation of the finished WARD LEONARD product.

WARD LEONARD ELECTRIC CO.
BRONXVILLE, N. Y.

110

The absence of any one of these four obvious essentials means a sacrifice of either capacity or endurance. Gurney Ball Bearings are the only ball bearings in which all of these essentials are always present and which possess raceways of the right contour.

Full Complement of Balls
Solid One-Piece Separator
Uninterrupted Raceways
Full Depth of Raceways, to Resist Thrust

CAPACITY
GURNEY
ENDURANCE



A full complement of large balls—deep, uninterrupted raceways of right contour—and yet a solid, one-piece

Ball Separator

This unique Gurney separator plays a mighty important part in sustaining the Gurney reputation for great capacity and great endurance. It is so sturdy and fool-proof that separator troubles are never encountered in using Gurney Bearings. Die cast, of special wear resisting alloy, this separator, as the name implies, has no joints, screws or clips to come apart or loosen or otherwise interfere with continuous bearing performance. In fact, the separator will be the last part of the bearing to wear out.

The use of this unique separator does not necessitate a reduction in the number of balls. With it, it is practical and safe to run the balls much closer together than with any other separator ever made. The partition or septum between each pair of balls is so efficient and so durable that it does not have to be so thick as to displace some of the balls and so reduce the capacity of the bearing.

Bear in mind always when considering ball bearings that most important is the question of raceway contour, for just so far as you fall short of right contour, in just so much do you fail to realize the full efficiency to which you are entitled.



Gurney Ball Bearing Co.

Jamestown, New York

GURNEY
Ball Bearing Shaft Hangers
Save power, oil and repairs.
Increase your power capacity.

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AJAX
MILEAGE CONTEST

The Ajax-Grieb Rubber Company, as an incentive to the proper care of Ajax Tires (guaranteed in writing for 5,000 miles) and to publicly demonstrate their wonderful mileage

OFFERS $5,000 IN CASH PRIZES

To the **LICENSED CHAUFFEURS** obtaining the greatest mileage on any Ajax Tire from APRIL 1, 1913, TO MARCH 31, 1914.

Prizes to be Distributed as Follows:

STANDING OF CONTESTANTS ACCORDING TO MILEAGE						
1		1 prize				$ 500.00
2		1 "				300.00
3		1 "				200.00
4- 8	(inclusive)	5 prizes	of	$100.00	each	500.00
9- 18	"	10 "	"	50.00	"	500.00
19- 58	"	40 "	"	25.00	"	1000.00
59-108	"	50 "	"	20.00	"	1000.00
109-208	"	100 "	"	10.00	"	1000.00
		208 Prizes				$5000.00

The Contest is open to licensed chauffeurs but not to owners or chauffeurs driving their own cars. Entrants are to make application at once to Ajax-Grieb Rubber Co., New York, nearest **Ajax Branch or Ajax Dealer**, for blank on which formal entry must be made to Contest Department, Ajax-Grieb Rubber Co., 1796 Broadway, New York. On this blank must be recorded Size of Tire, Serial Number, Where and of Whom Purchased, Date of Purchase, When Put in Service, Speedometer Reading at Start—all to be countersigned by the employer of the chauffeur. When official entry has been made a report card will be furnished by which the entrant will supply the Contest Department, Ajax-Grieb Rubber Co., 1796 Broadway, New York, the date each tire is out of use, the speedometer reading, etc. —this report to be countersigned by the employer.

What the Ajax Mileage Contest Means to Owners

Owners will recognize at once the merits of the Ajax Mileage Contest. It will mean a direct interest on the part of the chauffeur in the Mileage obtained from the Ajax Tires on his car—the same care and consideration of these tires as the **good** chauffeur gives to the entire mechanism of his machine. The use of Ajax Tires (guaranteed in writing for 5000 miles) under any conditions is a Great Economy. With better care and increased interest on the part of the chauffeur **this economy will be even greater.**

COMMITTEE OF AWARDS

A committee of men well known in different walks of life has consented to judge the final awards. This committee consists of Alfred Reeves, Vice President and General Manager, Hartford Suspension Co., Jersey City; R. A. Patteson, Vice President, Tarrytown National Bank, Tarrytown, N. Y.; L. W. Scudder, Certified Public Accountant, Investors Agency, 55 Wall St. In case of ties, lots shall be drawn by this committee.

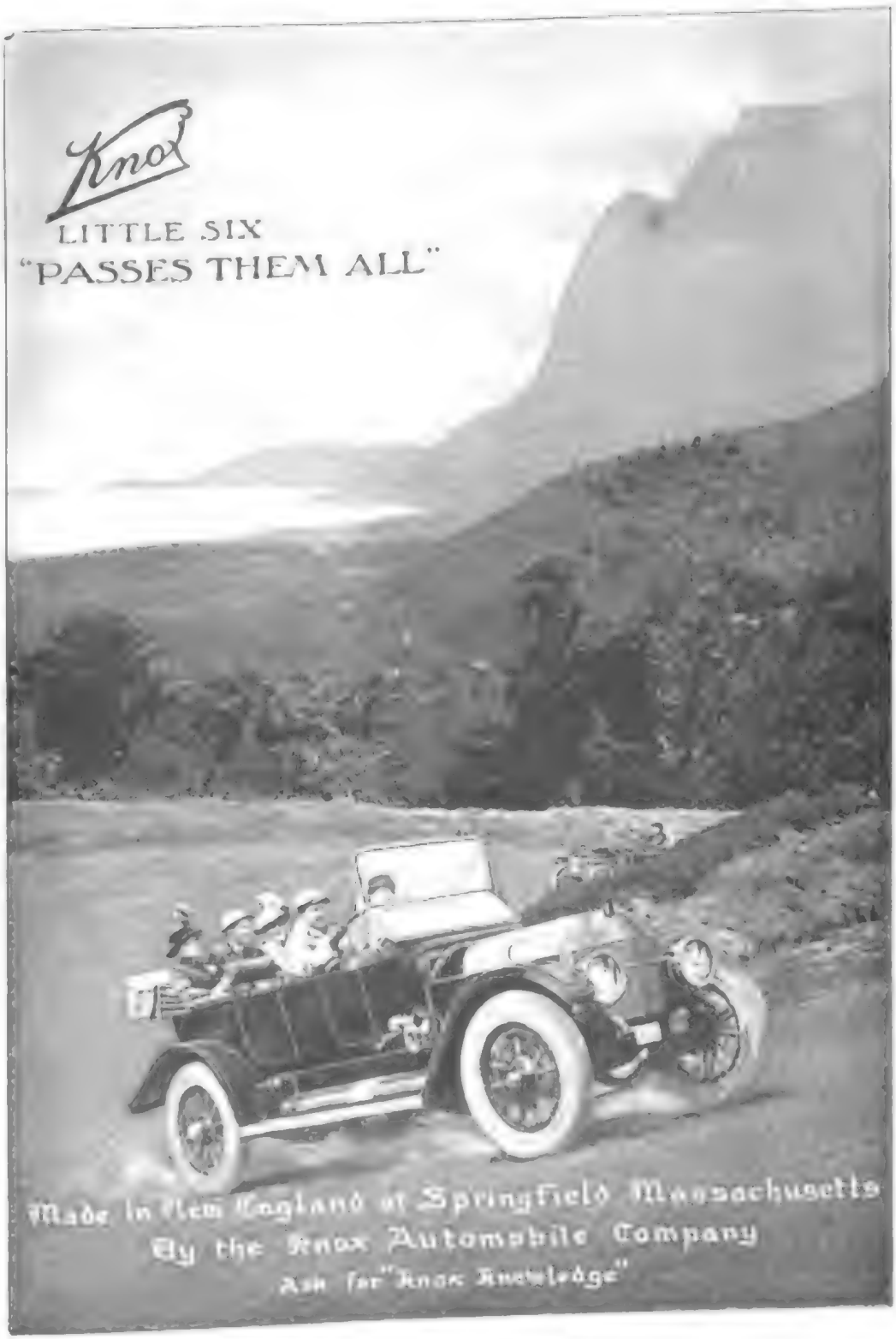
CHAUFFEURS—It Costs Nothing to Enter the Ajax Mileage Contest. The only Requirements are that your car be equipped with Ajax Tires (guaranteed for 5,000 miles) and that you fill out the regulation entry blank, signed by your employer. Entry may be made to any **Ajax Branch or Dealer** before March 31, 1914. THE SOONER YOU ENTER THE LONGER TIME YOU WILL HAVE TO WIN A PRIZE.

AJAX-GRIEB RUBBER COMPANY, Contest Department D 1796 Broadway, New York

AJAX BRANCHES

Brooklyn—1162 Bedford Avenue
Boston—15 Park Square
Philadelphia—316 No. Broad Street
Atlanta—48 Auburn Avenue
Dallas—1513 Jackson Street
Detroit—507 Woodward Avenue
Chicago—18th St. and Michigan Ave.
Cleveland—18th and Euclid Avenue
Kansas City—1606 Grand Avenue
Minneapolis—905 First Ave., South
Denver, Colo.—1518 Broadway
San Francisco—Golden Gate and Van Ness Aves.
Los Angeles—1229 So. Olive Street
Portland, Ore.—329 Ankeny Street
Seattle—917 East Pike Street

DEALERS IN PRINCIPAL CITIES



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OPEN LETTER (NO. 2) FRO



MAXWELL MOTOR COMPANY
INCORPORATED
DETROIT, MICHIGAN

March 15, 1913

SUBJECT: WHY WE CHOSE THE NAME MAXWELL.

Gentlemen:-

This is the second of the series of letters in which I promised to treat frankly and fully with every phase of our policy, and give you, as directly interested parties, the reasons why.

In letters and in personal conversation, many dealers have asked, "Why did the reorganized company adopt the name Maxwell for the whole line of cars?" So I will answer that.

In a word, the reply to the question is: Because that name stands for more than any other name we had a right to use.

Now to elucidate: We could have used, an entirely new name, with all the lost motion that involves in the way of establishing a new product and a new name in the public and trade confidence.

More, it would have left us open to the accusation of adopting a new name so as to avoid responsibility with regard to past models made by the various companies that are now incorporated in this concern.

So that was not to be thought of.

Or, we could use rightfully the following names: Stoddard-Dayton; Maxwell-Briscoe; Sampson; Brush; Courier; Flanders.

Let's consider the last name first, since you would naturally suppose I would like to see my own name on the product.

The name Flanders on a motor car is confused in the minds of the public. To some it means E-M-F (E.M. Flanders), to others Flanders "20" and to still others Flanders Sixes. Not to mention Flanders Electrics, which were made by an entirely different concern, tho the public has never known the difference.

Now to be frank, on only one of the above mentioned cars does the name mean anything today. E-M-F "30" and Flanders "20" are really Studebaker cars. I have had no active connection with that concern for more than a year.

So the only cars now out, on which the name stands for anything

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MR. FLANDERS TO DEALERS

are the Flanders Sixes—and there were less than 100 of these cars in hands of users when the Flanders Motor Company was absorbed by purchase by this concern.

Now consider this: There were in hands of owners more than 100,000 cars known as "Maxwells".

That was more than all the cars that had been made by all the other concerns combined—Stoddard-Dayton, Brush, Sampson, Flanders, etc.

And Maxwell cars were always honest cars.

So were all the others—but the grounds on which we selected the name were the number of owners to whom we felt the new company owed allegiance and service.

And we also considered the dealers who have sold so many Maxwell cars. Would it be fair to them to adopt any other name?

Maxwell dealers were always loyal—why ask them to transfer allegiance from a name to which so much sentiment as well as success was attached?

Looking at the matter from a purely business standpoint, do you not agree that we selected the best name—the name that stands for more in the trade and means more in the way of a guarantee of good faith to old customers on the part of the new company.

Here let me assure all dealers who sold and persons who now own Stoddard, Brush, Sampson, Flanders and any of the other cars formerly made by the companies which now constitute the Maxwell Motor Company, that we feel we owe the same loyalty to them. We will continue to make and promptly furnish replacement parts for all former models—so they remain current as the latest coined dollar.

I am sure we selected the best name, and when you have considered it from every angle, I know you will agree.

Yours very truly,

MAXWELL MOTOR COMPANY (Inc)

Walter C. Flanders.

President and General Manager,

P.S. In the next letter I will explain "Why we did not use all our plants."

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14,299 Men

Wrote for Facts About This "40"

The advertising of the Michigan "40" has so far brought us inquiries from 14,299 men.

It has brought hundreds of dealers here to inspect it—dealers who have bought.

It has brought to us experts from eleven foreign countries. And this car will be running, before the season is over, on half the roads of the world.

Why They Came

They came because this car is built by W. H. Cameron, who has built 100,000 very successful cars.

They came because John A. Campbell designed for this his most artistic body.

They came because every detail, every specification, shows the utmost in modern practice. And because no other car in the whole Forty class begins to give so much for the money.

Make Comparisons

What other car under $1,950 has four - forward - speed transmission? What other car in this class has such tires, such brakes and springs, such margin of safety?

What car at any price has 14-inch cushions, a 22-coated body, such impressive design, such width of seat?

What car has a better engineer behind it, a better body designer, or a factory with better facilities?

And what car is advertised more efficiently than the Michigan "40" this year?

We are not lacking orders, but we seek this year the widest distribution. In every section we want a few cars to build up Michigan prestige.

If you are seeking the utmost in Forties let us hear from you.

Michigan "40"

$1,585

With All These Special Features

Four-forward-speed transmission, as used today in all the best foreign cars.
Oversize tires—35 x 4½ inches—making the Michigan practically the only excess-tired car in America.
Electric lights—with dynamo.
Center control.
Left side drive, to which all the best cars are coming.
40 to 46 horsepower.
Cylinders—4¼ x 5½ inches.
Brakes—extra efficient—drums 16 x 2½ inches.
Springs — 2½ inches wide — front, 37 inches long; rear, 50 inches long.
Steering post adjustable. So are clutch and brake pedals, insuring perfect comfort and fit to every driver.
Shortsville wheels, with 1¼-inch spokes —12 to each wheel.
Demountable rims — Firestone quick-detachable, with extra rim.
Wheel base—118 inches.
Straight-line body, designed by John A. Campbell. Finished with 22 coats.
14-inch Turkish cushions — The deepest cushions, we believe, and the most comfortable in use on any car.
Rear seat 50 inches wide inside — 22 inches deep. Doors 20 inches wide. Tonneau room 50 inches either way.
Nickel mountings.
Headlights—electric—12½ inches diameter, very powerful.
Sidelights—set in dash—flush with it.
Windshield built as part of body, easily inclined to any angle.
Mohair top, side curtains and envelope complete.
Electric horn.
$50.00 Jones Speedometer.
Foot rail, robe rail, rear tire irons, tool chests, with all tools, under running boards.
Over-capacity. Every driving part made sufficient for a 60-horsepower motor.

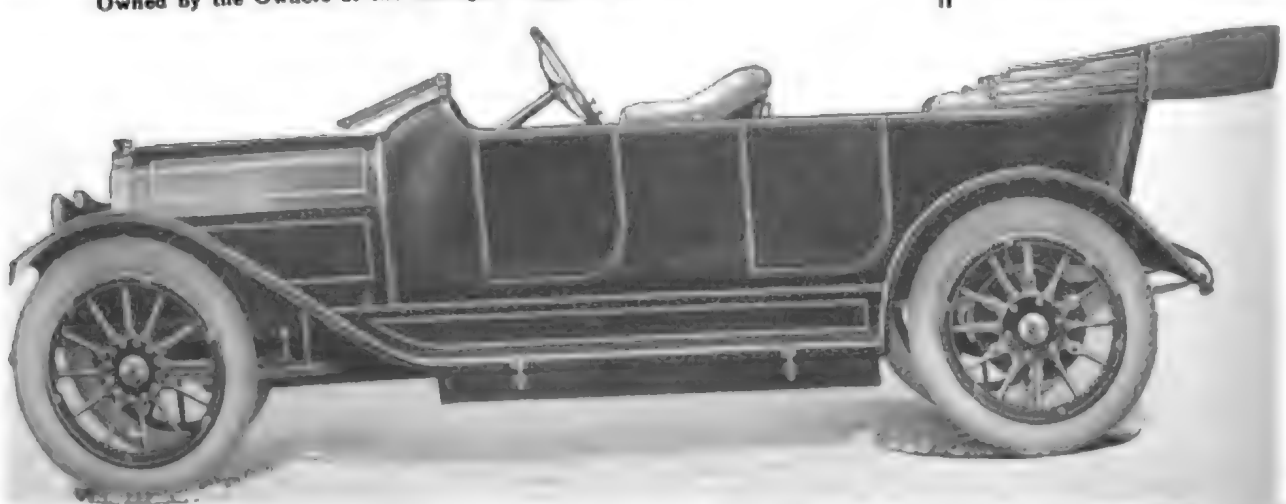
Self-Starter

There is such a difference of opinion about the relative merits of the various types of self-starters that we have not adopted any one type as regular equipment. We prefer to leave this selection to the buyer.

However, we equip with either the gas starter or a positively efficient electric starter, at a very moderate extra price. (167)

MICHIGAN MOTOR CAR COMPANY, Kalamazoo, Michigan

Owned by the Owners of the Michigan Buggy Company



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SPRINGFIELD CONVERTIBLE BODIES

Dealers who anticipate the wants of hypercritical car buyers will be quick to see the advisability of specifying Springfield Convertible Bodies, for it stands that they make good cars still better and the quality argument they offer is too big to be discounted.

As specifications they offer a strong selling argument for both the manufacturer and dealer.

Beauty, convenience and sterling worth of these bodies is apparent to all who have seen them and studied their construction.

We show here an illustration which is a faithful picture of one of our products—made in a factory equipped to turn out bodies and tops of every style and size, from the smallest runabout to the most pretentious limousine or landaulet.

Send for complete details of construction.

SPRINGFIELD METAL BODY CO.

Springfield, Massachusetts




Monarchs of Easy Motion
F & S PATENT
F&S
BRETZ COMPANY
SOLE IMPORTERS
F & S Ball Bearings
250 West Fifty-fourth, New York



BOSCH PLUGS

As Good As Bosch Magnetos

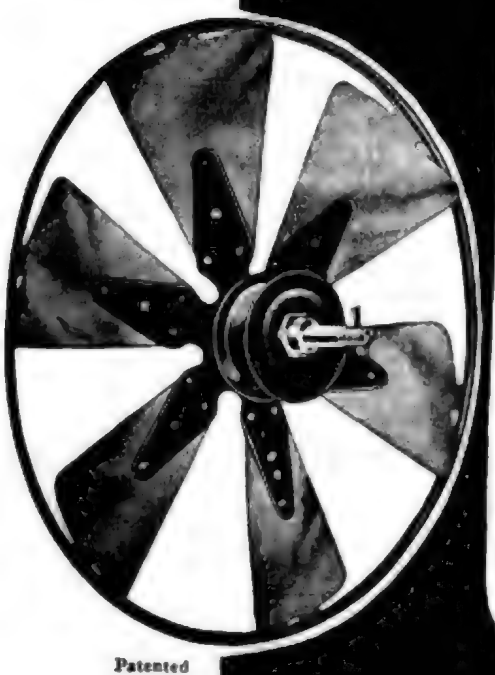
BOSCH Plugs like Bosch Magnetos are built on a quality basis, **not** on a price basis, the quality basis that has maintained Bosch Reputation at zenith in the gas engine industry. That is why Bosch Plugs are selected by those engineers and motorists who desire the utmost.

Bosch Plugs are made better and consequently serve better. Dealers find they sell without effort and add quality reputation to their establishments. Your orders are desired on the basis that you will be satisfied.

$1.00 each, from your dealer or direct

Write for "Locating the Spark Plug," an instructive book sent gratis.

Bosch Magneto Company
224 West 46th Street, New York
Chicago ∴ Detroit ∴ San Francisco ∴ Toronto



Patented

1913 Fans

Before considering your next season's requirements ask for results of tests recently conducted with Sparks-Withington One Piece Blade Radiator Fans. This information will be furnished gladly, and it may mean improvement to your cooling system.

Our Capacity 1,000 Fans Per Day

Get Catalog

The Sparks-Withington Co.
Jackson, Michigan and Walkerville, Canada

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Write for a Copy **You will find it interesting**

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MANUFACTURER, JOBBER, EXPORTER AND IMPORTER

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THE ATWATER KENT SYSTEM

has been silently advertised from coast to coast by the best advertising anybody can have—the personal endorsement of over 100,000 satisfied users.

The Atwater Kent Ignition System has no rival—no competitor. We do not use this term metaphorically, but in a literal sense.

You may think this is the use of a trite advertising term, but in this case it is nothing of the kind. That the Atwater Kent has no rival in the opinions of thousands of users has been demonstrated to us many-many times, when in ordering their new cars they have specified that they should be "Atwater Kent equipped."



There are a number of other good reasons for the superiority of the Atwater Kent System over the magneto and it is worth your while as a jobber, dealer or prospective buyer, to weigh and consider them carefully.

Space forbids our mentioning these reasons even briefly, but if you will write for our booklet "D," we will give you some of them. Then ask the motorist who drives a car "Atwater Kent equipped" and he will tell you the others, and the best reasons why the Atwater Kent Ignition System has no real rival.

ATWATER KENT MFG. WORKS **4940 Stenton Avenue Philadelphia, Pa.**

DISTRIBUTORS

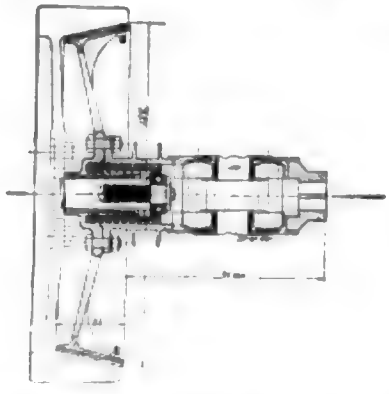
New York—E. J. Edmond Co.; Chicago—Motor Car Supply Co., Pellets Magneto Exchange; San Francisco—Chanslor & Lyon Co., Weinstock-Nichols Co.; Los Angeles—E. A. Featherstone; Seattle—Chanslor & Lyon Co.; Portland—Ballou & Wright; Omaha—Omaha Rubber Co., Powell Auto Supply Co.; Dallas and Houston—Fisk Co. of Texas; Wichita—Hockaday Auto Supply Co.; St. Louis—Missouri Auto Specialty Co.; Salina—Lee Hardware Co.; Kansas City—Kansas City Auto Supply Co.; Milwaukee—Julius Andrae & Sons Co.; Detroit—Automobile Equipment Co.; Boston—Motor Supply Shop; Denver—Auto Equipment Co.; Hartford—Post & Lester Co.; Atlanta—Elyea-Austell Co.; Chattanooga—Southern Auto & Supply Co.

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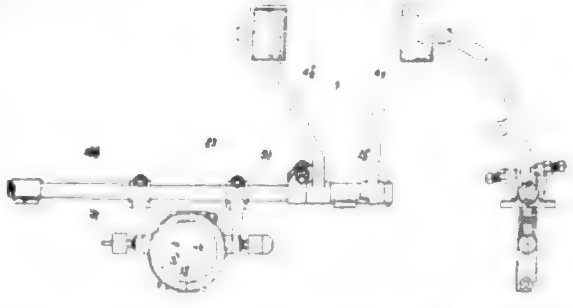
AUTO PARTS
1 or 1000

In the first instance we suggest our standard designs and can ship from stock.

In the second, will modify to suit your requirements and begin shipments in two weeks to thirty days. During the past five years, we have supplied parts for some of the best cars, and therefore have a broad experience in the manufacture of parts.



Cone clutch with double universals in sizes ranging from 30 to 60 H.P. Special features, easy engagement of cone and long life.



Pedal assembly with bronze or ball bearing throw-out yoke, pedals of various styles to suit your requirements.

THE OTTO KONIGSLOW MFG. CO.
3510 Perkins Avenue
CLEVELAND, OHIO

Detroit Office: J. H. GOULD, 1202 Majestic Bldg.

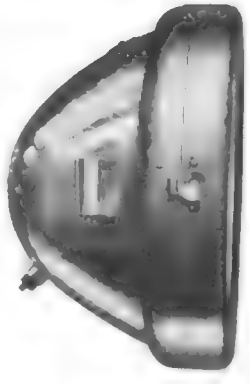
Good Profit In Automobile Lamps

Electric Lights have become a part of every up-to-date automobile.

There is a big demand for new lamps right now, when cars are being overhauled by the hundreds.

Stock up and be in shape to take care of lamp customers—and get your share of the profits.

Guide



The Lamp of the Great White Ray

sells best because it gives the strongest ray, stands up in service and can be bought at a price within the easy reach of all.

WRITE TODAY

for our money-making proposition to dealers, and learn what we are doing to help the dealer move the goods.

The Guide Motor Lamp Mfg. Co.
2071 EAST FOURTH STREET
CLEVELAND, OHIO

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The value of your motor car depends upon the quality of its parts.

In its assembling you used several hundred screw machine parts—and upon them much of the car's efficiency depends.

Accurate NAMCO products are the result of a careful study of the requirements of the automobile industry and a long experience in serving nearly every manufacturer of motor cars or accessory equipment. When you buy NAMCO Screws and Special Parts you get accurate parts that stand the test of your inspector, make your assembling easy, and hold up on the road. That nearly all high grade cars use NAMCO parts in increasing numbers each year indicates the superior quality of NAMCO screw machine work.

Our estimating department quotes promptly upon receipt of your samples. Let us have them with your inquiry and ask us to send "Special Milled Product" book. It shows the wide range covered by NAMCO product.

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ONE TON TRUCK

Chassis $1660 **Express $1750**

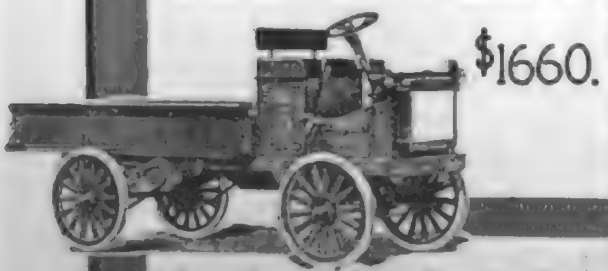
This sturdy truck is actually doing its work at a very low cost.

Many users are getting fifteen miles per gallon of gasoline consumption.

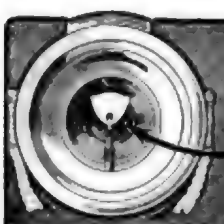
See our exhibit, Space 33, Main Floor, Boston Show, March 19-26.

SANFORD MOTOR TRUCK CO.

St. Marks Place and Sanford Sq. SYRACUSE, N. Y.



Export Dept., 17 Battery Place, New York, Room 333.



The flame is always just this high when you use

The Prest-O-Lite Automatic Reducing Valve

With this device attached to your Prest-O-Lite, you do not have to turn the tank valve up or down to get the correct flame in the lamps.

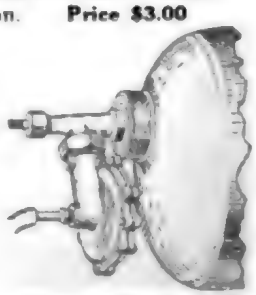
Turn on the gas, light your lamps, and the flame is bound to be just right, without any adjusting.

It pays for itself in gas saved, so its convenience costs you nothing.

Unlike other reducing valves, the Prest-O-Lite Automatic gives the correct gas pressure at all times, whether the tank is full, half full, or nearly empty. It is truly automatic in its action. **Price $3.00**

Anyone can attach it in less than five minutes.

Your dealer has it or will quickly get it for you. If not, we'll send it to you on receipt of price. Try your dealer first. Every Prest-O-Lite Branch Office has this Automatic Reducing Valve in stock.



The Prest-O-Lite Co.

287 E. South St. Indianapolis, Ind.

Canadian Office and Factory, Merritton, Ont.

Price in Canada, $3.50

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Electric Company

(With a country-wide system of branches and service stations)

Designers and Builders
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High Grade Starting and Lighting Equipment for Motor Cars
(Sold to car makers only)

Makers of magnetos for fourteen years.

Our country-wide service is available to each user of Remy equipment.

Write us today about our magneto exchange offer. We will make a liberal allowance for old equipment (any make)

REMY

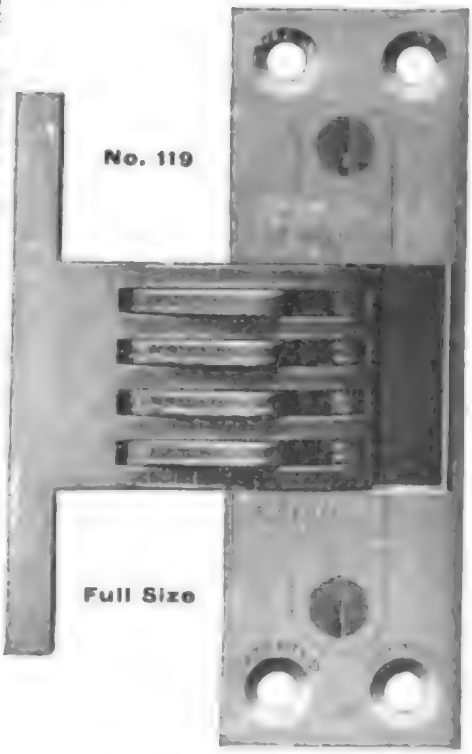
Pioneer Manufacturers of Ignition Equipment.

Factory and General Offices:
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"SOSS" INVISIBLE AUTOMOBILE HINGES

The detachable and water-tight features of our No. 119 Automobile Door Hinge, in addition to the interlocking action, makes this the best, as well as the strongest constructed concealed hinge on the market. Made in two parts, it is easily attached and detached. Water will not reach the wood of the body through the hinge. When installed holds the door rigid and at the same time has a perfectly smooth action.

Send now for catalog and full particulars.

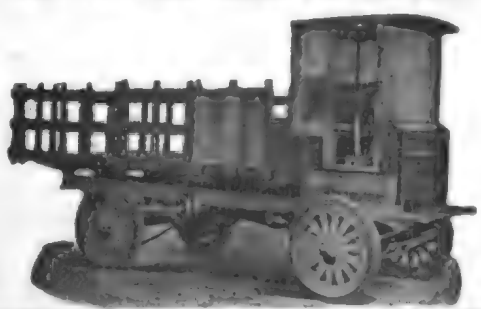


SOSS MANUFACTURING COMPANY
435-443 Atlantic Avenue
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Lauth-Juergens

Lauth-Juergens Trucks are Delivery Insurance

QUALITY DURABILITY
ONE, TWO AND THREE TON CAPACITY



LAUTH-JUERGENS TRUCKS ARE THE LATEST IN CONSTRUCTION, most powerful in operation and the motors are guaranteed against defective workmanship and material for the life of the truck. They are positively the highest class trucks made. Two cylinder, one-ton, four cylinder, one, two and three-ton. Four speeds forward. Hess-Bright ball bearing transmission made in our own shops of the finest tool steel, three-piece disc clutch, covered by patents owned by us. Send for 1912 Catalog and specifications. Prompt delivery on all models. Large publicity campaign just begun. Our quality will do the rest.

Reliable Agents: Secure Your Territory for 1912 at Once.

The Lauth-Juergens Motor Car Co., Fremont, Ohio.

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BOSTON—David Abrams, 181 Portland St.
NEW YORK—West Side Garage & Motor Co., 160-162 101st St.
CHICAGO—The Lauth-Juergens Motor Car Co., 2030-32 Wabash Ave.
NEWARK, N. J.—Merchants Motor Car Co., Essex Building
DETROIT, MICH.—Bierl Auto Truck Sales Agency, 453 Dix Ave.
DISTRICT OF COLUMBIA AND VICINITY—Bowles Motor Sales Co. Inc., 1608 14th St. N. W., Washington, D. C.

The SCHRADER Universal Tire Pressure Gauge



For Sale by Tire Manufacturers, Jobbers, Dealers, Garages or

A. SCHRADER'S SON, Inc., 32 Rose St., New York

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Good Wire Insures Full Efficiency

The manufacturers of starting and lighting systems, magnetos and batteries who want to get full efficiency out of their plants always hook up to

Packard CABLE

Good cable is just as essential as good material and first class workmanship.

We know of several manufacturers of starting and lighting systems who have greatly increased the efficiency of their product by using Packard Cable.

No other cable is just as good—Packard cable is so constructed that it doesn't break at the terminals or go bad when subjected to hot oil, dirt or water.

We'll send you a sample to examine if you will send us your name.

The Packard Electric Company

Dept D, Warren, Ohio

(10)

KLINE KAR

"FORTY" $1985

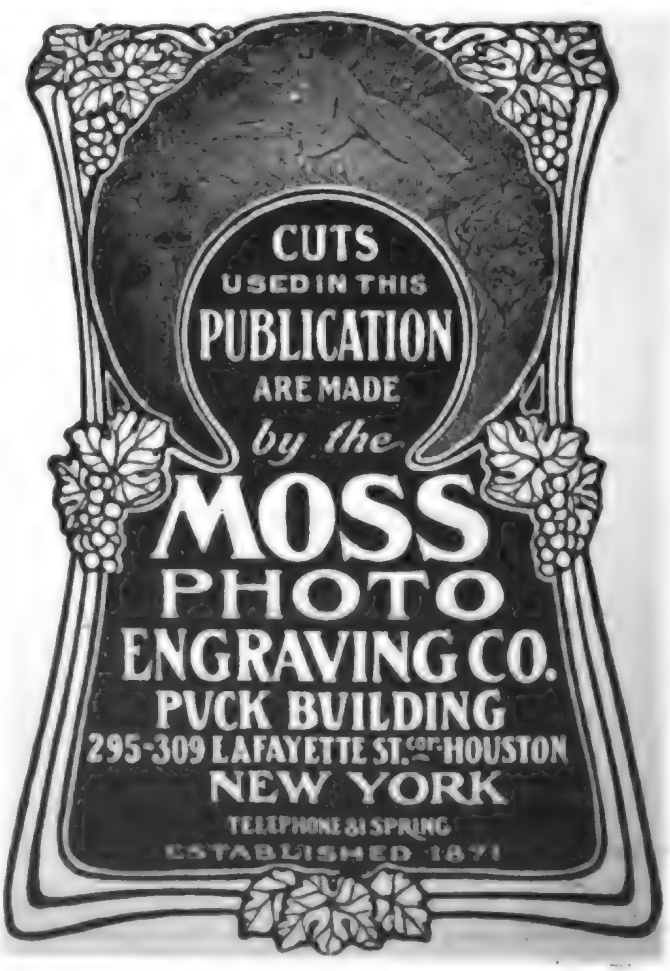
The best four-cylinder forty horsepower car on the market with separate electric starting and lighting, and separate ignition systems. The economical four speed forward transmission is another big asset.

Address Dept. W for Catalog

KLINE MOTOR CAR CORPORATION

Richmond, Va. **York, Pa.**

Main Office and Factory, Richmond, Va.



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The Reasons for Jencick Quality and Jencick Prices are worth knowing.

JENCICK MOTORS
For Motor Trucks

from base to spark plug, have features that are "Different and Better."

JENCICK MOTOR CORPORATION
Port Chester, New York

CUBIT ELECTRIC HORN

Retail Price $3.75 Complete

Our dealers selling them by the thousands. A real signal with high toned musical blast. The logical successor to the bulb horn. Economical current consumer—gets better with age.

Write for Territory

NONPAREIL HORN MANUFACTURING COMPANY
73-75 Wooster Street, New York

Ford
THE UNIVERSAL CAR

We have had to double our gigantic output—and the demand is more than doubling. Nearly 180,000 have been sold and delivered. New prices $525 to $800. Dealers everywhere. Ford Motor Company, Detroit, Michigan.

The New Process Gear Corporation

Cut Gears of Quality
Complete Differentials

The New Process Gear Corporation
SYRACUSE, N. Y.

The New Process Gear Corporation

SPRING BOLTS

One of the "Little Things" in your car that sum up to make "Big Satisfaction" or "Big Disappointment."

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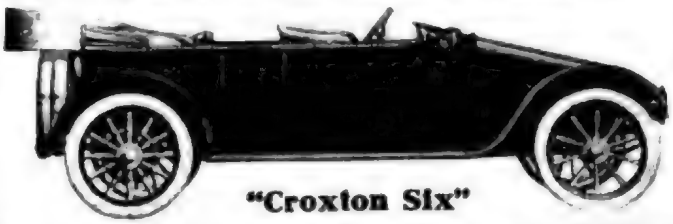
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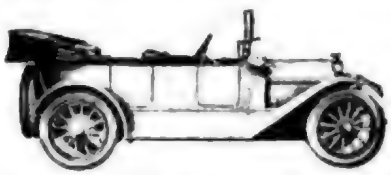
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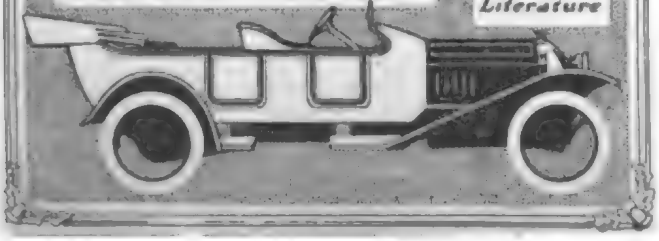
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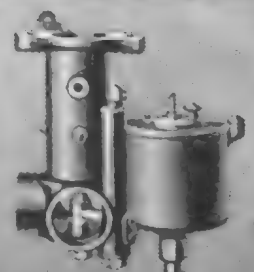
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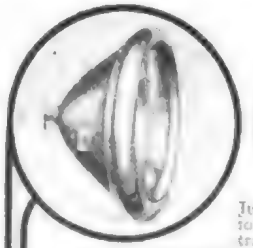
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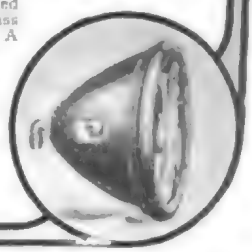
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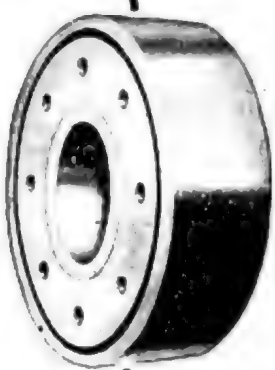
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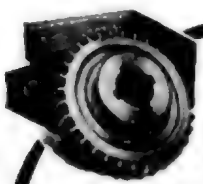
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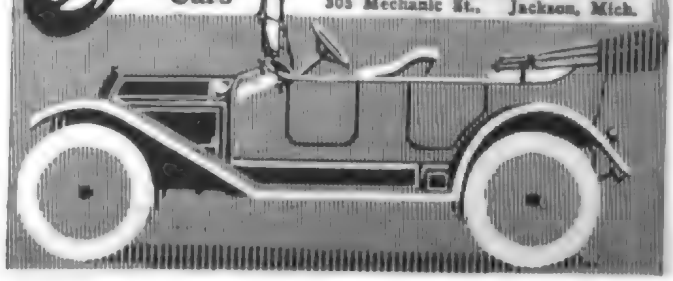
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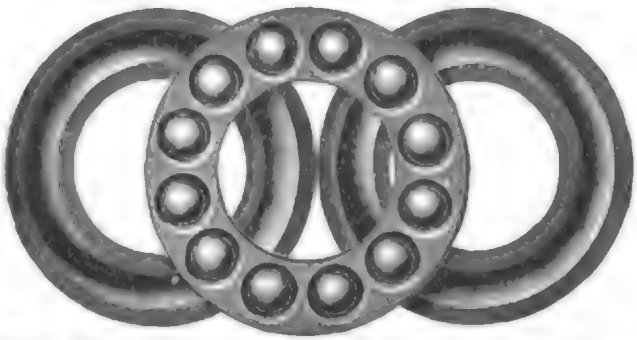


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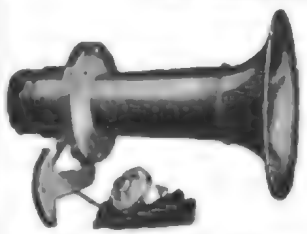
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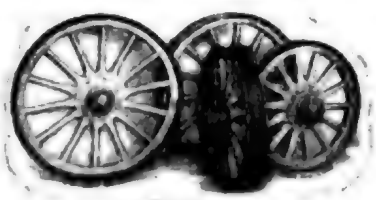


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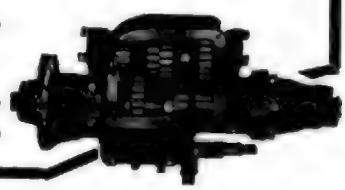
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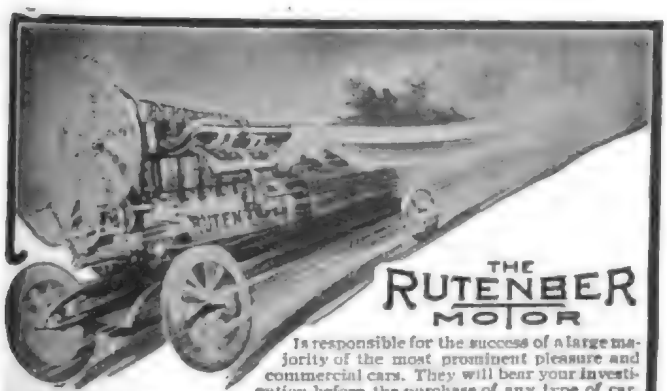
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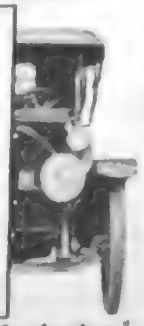
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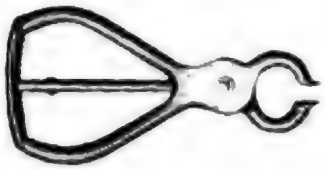
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All Acknowledge the Necessity of

Weed Chains

In one of those friendly after-luncheon, get-together parties at a well known city club, eleven men drifted on to *the subject of the dangers of skidding.* With a single exception each of the eleven owned an automobile, and each had a *skidding experience* to relate, and each felt that *his particular predicament* was the most sensational and startling.

While nearly all had experimented with the various so-called anti-skid tires, and acknowledged their possible advantages when new—yet when it came right down to "Brass Tacks," there wasn't a single one in the crowd but admitted that *for sure results,* for the **absolute elimination** of every possibility of skidding, **nothing even approximated Weed Chains,** and nothing took their place. Every one of the ten owners carried at least one pair of Weed Chains in his car.

Go where you will, put the question to any assembly of automobile owners you like and the verdict will always be the same—"*We can't get along without them.*"

Weed Chains are universally acknowledged to be the only anti-skid device that can be absolutely relied upon at all times and under all road conditions.

Weed Anti-Skid Chains

Insure perfect control and safe, comfortable driving

Don't foolishly pride yourself on taking chances in order to prove your bravery, or to demonstrate your ability as a driver.

Weed Chains are an absolute necessity on both rear tires and to doubly guard yourself against accidents and to make steering comfortable and easy, put them *on the front wheels too.* They cannot injure tires because "they creep"—occupy very little space when not in use—applied in a moment without the use of a jack or other tool.

Take precaution now When you know the folly, the danger, the peril there is in driving your car over icy, slippery, snow covered roads and pavements, why not fully equip your car today with **Weed Chains** for your own protection and for the safety of other road users.

Recommended and sold by all reputable dealers

WEED CHAIN TIRE GRIP CO.
28 Moore Street New York

Manufactured in Canada by
THE DOMINION CHAIN COMPANY, Ltd.
Head Office: 4 Park Avenue, Montreal, Canada



WEED CHAIN
Wisdom Saves Time and Money

TIMES SQ. AUTO CO.

NEW YORK
1710-1718 BROADWAY

CHICAGO
1210 to 1212 MICHIGAN AVE.

NEW CARS
USED CARS
MOTORS
BODIES
TOPS and
EVERY
ACCESSORY
FOR THE
AUTOMOBILE

At From
20c. to 50c.
on the Dollar

We Are the Largest Dealers in the World in New and Used Cars and Factory Cleanups

The Bush Radiator

THE BUSH MANUFACTURING CO.
HARTFORD, CONN.

METZ "SPECIAL" $445

Completely equipped, fully guaranteed. 22½ H.P., 4-cylinder water-cooled motor, Bosch magneto. Artillery wheels, best quality 30" x 3" clincher tires. Makes 5 to 50 miles per hour on the high speed, 28 to 32 miles on 1 gal. of gasoline. You can secure EXCLUSIVE SALE in your territory. Send for Book "B."

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Glare Eliminator
Screen for Auto Headlights

Tones down headlights for city driving and foggy nights—an auto necessity. Price 75c. per pair. Sell like hot cakes. Dealers, secure the agency quick.

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The Stutz Has a Powerful Motor—

that will pick up on any road or hill at the touch of the throttle. It has attained a record second to none for consistent performance.

Write today for advance booklet A-15, Sturdy STUTZ Announcement, Series B.

IDEAL MOTOR CAR COMPANY, Indianapolis, Ind.

Red Head
REGISTERED U.S. PAT. OFFICE

Magneto Plugs coax maximum power out of engine.
EMIL GROSSMAN COMPANY, Mfrs., New York and Detroit

CHAMPION SPARK PLUGS

Special Designs for Every Type of Motor Made
CATALOG MAILED ON REQUEST
CHAMPION SPARK PLUG COMPANY
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The Economy of Quality

¶ If you are going to sell your car in a few days, you can use any old oil and let the other fellow pay the subsequent repair bills.

¶ But if you expect to run your car three thousand miles further—

INVADER OIL

will save you money and give you a better car to sell—or keep.

¶ Invader Oil may cost a little more to buy—but it's by far the cheapest oil to use.

I-O-C GEAR OIL

Formerly Invader Gear Oil

"Puts Noisy Gears to Sleep"

is the only oil manufactured especially and exclusively for the lubrication of automobile transmission gears.

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(Lessees of Charles P. Kellom & Co.)
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PHILADELPHIA BOSTON WASHINGTON

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Save 50 to 75% OF YOUR WATER EXPENSE



The nozzle with automatic shut-off, fits end of hose, prevents waste, saves time, money and fuel. When warm water is used only exact amount necessary is heated, as no water is wasted and over one-half of the fuel bill is saved besides insuring full supply at all times.

If water is supplied on measured service this nozzle will positively save you from 50 to 75% of your water bills.

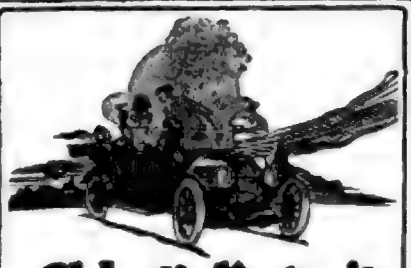
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Abbott-Detroit

"The demand of the day is that an organization shall be judged by its product and not by what it claims for itself" Keep this in mind when you examine these 1913 models

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30-40	Fore-door Roadster, 116-inch wheel base	$1700
34-40	5-passenger, Fore-Door Touring Car 116-inch wheel base	$1700
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WATERLOO STREET DETROIT, MICH.
"Built for Permanence" "Guaranteed for Life"

NATIONAL Compound Mixer and Primer

makes any car start easier in cold weather; adds 10 to 40% to power and mileage. Simple, easily installed, guaranteed effective on any motor. Get details and price.

NATIONAL MANUFACTURING CO., Kalamazoo, Mich.

The Ford Water Circulator

forces the water from radiator through cylinder water jacket, maintaining rapid circulation when car is in motion. Write for descriptive matter if you handle Ford cars.

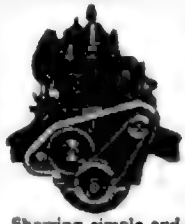
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Six Cylinder—Unit Power Plant
Three Point Suspension

The Continental "Six" is maintaining, on the road at this minute, the good name made by our four cylinder types.

Built to accommodate any type of self-starter now made. Suitable for right or left hand drive.

Showing simple and efficient chain drive for starting motor.

4 and 6 cylinders
20 to 70 H. P.

Write for booklets.

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Factory Representative, E. F. PETERSON
122 S. Michigan Blvd. Chicago

Perfection Spring Company

SPECIALISTS IN

Spring Suspension

High Grade Only

Cleveland, Ohio

AS A WARM HAND WHEEL DEALER

You will reap generous profits from easily made sales all over your territory. Every car owner who drives in winter will want this device as soon as he sees it. Write for Details.

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Famous for Their Durability

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The Starter Which Really Starts

The successful Starter for Fords as well as other makes. Combined Starter and Lighter, $35. Live Dealers given exclusive territory.

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Final and crowning achievement of R. E. Olds, pioneer designer of Autos. A standard size 30 to 35 horsepower four-cylinder car of modern refinements, priced at only $1,095.

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THE SELDEN TRUCK—$2000

Sold on Time Payment Plan

Best Agent's Proposition Ever Offered

Selden Truck Sales Co., 178 East Ave., Rochester, N. Y.

QUICK SALES—BIG PROFITS FOR DEALERS

Here is an accessory that will not stay on the shelf. It sells on sight.

MARVEL STEAM VULCANIZER

Automatic, therefore safe for rubber. Uses alcohol or gasoline. Low priced. Send for sales plan and sample Vulcanizer.

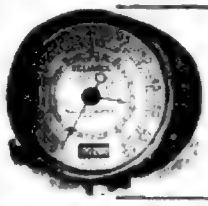
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NOW READY FOR THE TRADE

Highest Efficiency—Good Service Guaranteed

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"The Speedometer of Quality"

Special features that eliminate speedometer troubles. Send for the booklet.

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Quality Windshields

Auxiliary Seats, Bumpers and Gas Starters

POLSON MANUFACTURING CO., Buffalo, N. Y.

Mosler Spit Fire Plugs ARE THE BEST

A. R. MOSLER & CO.
P. O. BOX "M"
MT. VERNON, N. Y.

The Otho SYSTEM for Self Starting Lighting Ignition Signalling

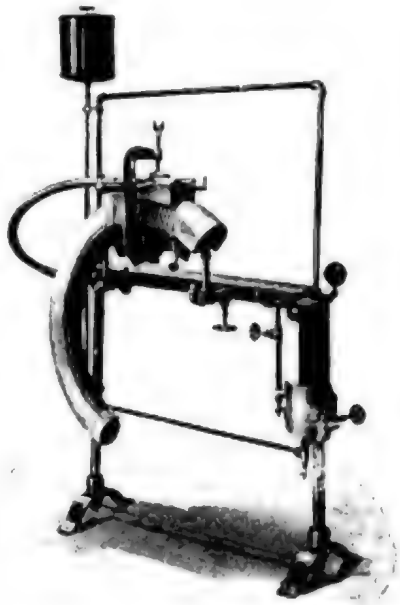
"Is right" Inside the Flywheel

Otho Motor Co., 60 State St. Boston, Mass.

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Blow-out repairs that outlast the tire.

The only way to make **durable** blow-out repairs **economically** is to reinforce the tire with fabric applied to the inside, fill the hole through the tire with Para gum, then apply heat **both** to the inside and outside. This method avoids cutting away and wasting a lot of expensive tread stock, requires a minimum of fabric and makes a repair that is stronger than the tire. Anyone can use it because the work is all straightforward, requiring no special experience. One set of forms fits all sizes of tires. No extra moulds required.



SHALER Steam Vulcanizer

The Shaler is the only steam vulcanizer that permits using the approved wrapped tread method as it is the only one that applies heat to the inside and outside of a tire simultaneously. It makes perfect blow-out repairs.

To make it complete as a garage equipment it is provided with a tube plate 4 x 30 inches that will mend six tubes as quickly as one.

The boiler, a conical copper coil, heated by a powerful gas or gasoline burner, raises steam so quickly that you can profitably heat the Shaler even if you only have a tube puncture to mend.

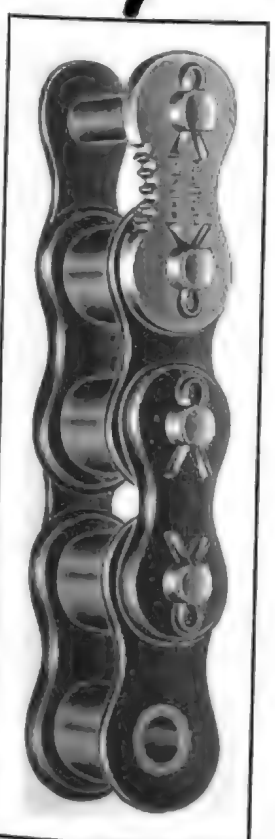
The essential Shaler feature of a thermostat to hold the temperature at the vulcanizing degree automatically makes it impossible to overheat a tire. Simply light the burner, and steam is raised to the correct pressure and held there indefinitely.

Price of the complete outfit, including all attachments for tube and casing work, $45.

C. A. SHALER CO., 411 Fourth St., Waupun, Wis.

Free — a tire handbook for repairmen

Write today on your letterhead for a copy of "Common Sense About Tire Repairs." It contains a lot of money-making ideas about the most profitable part of the repair business.



"WHITNEY" Chains

WE call your attention here to "Whitney" Cotter Detachable Chains as the most practical chains ever offered for motor vehicles. They have made a record for themselves which no other Detachable Type has approached.

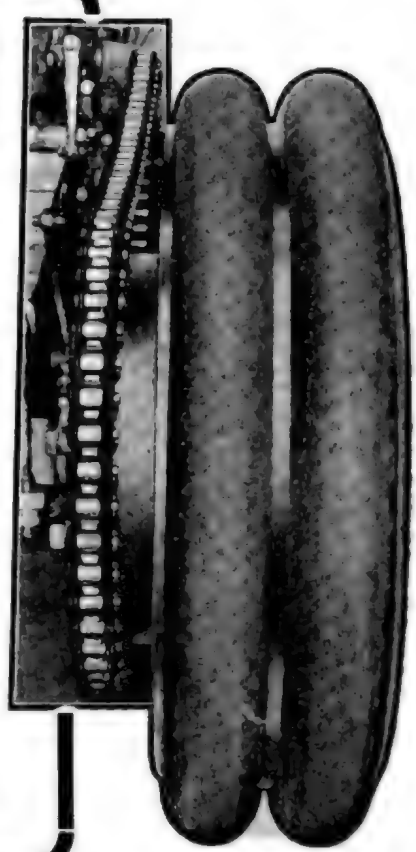
This Cotter Pin feature is so practical and necessary that it calls for little detailed explanation. The illustrations tell their own story, proving that this form of construction is logical and necessary for chain equipped motor vehicles. This Cotter Detachable Chain can be taken apart at any link and lengthened, shortened or repaired without the use of any special tool, as the Cotter Pin can be removed with pliers, screw driver or any sharp pointed instrument. The use of "Whitney" Cotter Detachable Chains assures the builder, owner and driver of commercial vehicles uninterrupted service on account of the ease of repair.

"Whitney" Chains are made from steel best adapted for the purpose, carefully hardened and calculated to resist the most wear, while in the matters of machining and assembling the utmost care is exercised and thorough inspections and tests characterize each process of manufacture. Their future service, however, depends upon the accuracy of sprockets, care, lubrication, alignment and adjustment, for the best chain in existence cannot withstand the evil influence of improper conditions and give best results.

Write for our illustrated catalog which shows top and side views of each size of all Roller chains manufactured by us.

"Whitney" Chains Are Built for Strains

The Whitney Manufacturing Co.
HARTFORD, CONN.



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15 cents per line of six words, cash with order.
— In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

WHY PAY from $5.00 to $15.00 to have the Water Jacket or Radiator of Auto repaired when for $1.00 you can get a large tube of "FIRELESS SOLDER" that will positively do the trick without removing the engine or radiator from the frame. Send $1.00, money order or bill, and a regular $1.50 tube with testimonials will be promptly sent, charges prepaid. WAUSEO CHEMICAL COMPANY, Wauseon, Ohio.

PUNCTUREFIX.
RIDE ON AIR.

Is the new liquid that you put in your inner tubes, and when tire is punctured it seals it automatically without the loss of any air.

It increases the mileage of your tires 100 per cent; it positively will not freeze or get hard and will retain its efficiency forever.

Territory open for agents.
EUREKA PUNCTUREFIX CO.
142 Pike St. Covington, Ky.

BARGAIN for quick buyer—Forced to sell immediately my automobiles. Will sacrifice Oldsmobile, 1911 Model, seven passenger, specially built for owner, and Oldsmobile, 1911 Roadster, four seater, two rear seats detachable, absolutely like new; also Mitchell, 1910 Model, seven passenger auto, good as new. Above cars are fully equipped, in perfect running condition, and have been very little used. Will demonstrate. JOSEPH BRONSTEIN, 1265 Broadway, New York City.

A WONDERFUL BARGAIN.
OUR 1-TON GARFORD TRUCK IS NOT ADAPTED TO OUR BUSINESS; THEREFORE WE WILL SELL IT AT A BARGAIN; COST $2,350; SELLING PRICE $500 IF TAKEN QUICK; IN PERFECT RUNNING ORDER; YOU CAN'T AFFORD TO PASS THIS UP. THE ROYCE LAUNDRY CO., SPRINGFIELD, MASS.

PEERLESS LINING DYE
For dyeing the inside of all cloth tops and curtains. Makes faded, stained and grease spotted linings a black uniform color. Ask your dealer.
The Columbus Varnish Co., Columbus, O.

MACHINE Shops and Garages—Our WELD-IT-ALL machines will weld perfectly any broken casting that has a melting point. Full particulars on Oxy-Acetylene welding machines sent on receipt of your address. Every machine fully guaranteed. H. D. Prose & Co., Wichita, Kansas.

APPLY Boyer's Automatic Refinisher to your automobile today. Tomorrow it will look as though it just came from the factory. Finest thing in the world for dull hoods. Easily applied with cheesecloth. Particulars free. Boyer Chemical Laboratory Co., State and Michigan Streets, Chicago, Ill.

FOR SALE—Two Williams' Vulcanizing Kettles, in first-class condition. C. L. POST, 86 Gay St., Stamford, Conn.

WILL exchange well secured first mortgage on Florida property bearing 6 per cent interest for automobile. Write for particulars, 21 Broad St., Milford, Conn.

PEERLESS LEATHER TOP DRESSING
For leather, rubber and pantasote tops and curtains. Softens the top and renews the finish. Ask your dealer.
The Columbus Varnish Co., Columbus, O.

WANTED—Gas engine expert; man familiar with carbureters, fair talker, to travel with manager and demonstrate; $30.00 week. Apply to Mr. GIBBS, The Engineering Agency, Inc., 1662 Monadnock Bldg., Chicago, Ill.

PEERLESS AUTO TOP DRESSING
For mohair, duck and canvas automobile tops and curtains. Waterproofs leaking tops. Makes old tops a uniform color. Ask your dealer.
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FOR SALE—Overland car; will sacrifice if taken at once; am going to Europe and have no further use for same. Inquire HAUST'S CONFECTIONERY, 643 Grand St., Brooklyn, N. Y.

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Owners or dealers; any state, county or city; weekly and monthly supplements at lowest prices. Special lists of Electrics, Trucks, Fords, Studebakers, Overlands, etc.
MOTOR LIST CO. OF AMERICA
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FOR SALE—Stoddard-Dayton taxicab body in good condition. A bargain at $125.00. C. A. BURDETT, Hornell, N. Y.

FOR SALE—45 H.P. foreign Fiat, double chain drive, semi-speedster, two passenger, run about 1,000 miles. New tires and in excellent mechanical condition. Price $2,500.00, or will exchange. C. L. WHITING, 591 East Main St., Rochester, N. Y.

PLANT FOR SALE CHEAP—Suitable for auto bodies (especially limousine) and accessories. Power, lights, water, dry kilns, sprinklers, sidetracks, abundant storage. A. J. PHILLIPS CO., Fenton, Mich.

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A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

AUTOMOBILE salesman wanted on first class car, large commissions given. Apply to C. & C. AUTO CO., 1293 Bedford Ave., Brooklyn, N. Y.

CADILLAC 1911.

$675—5-passenger; top, windshield, slip covers, Prest-O, speedometer, extra shoes and tubes; entirely new; any demonstration. DUKE, 57 East 108th St., New York.

MANUFACTURING.

We have complete facilities for making your automobile accessories, electrical or mechanical devices, drop forgings, stamping or machined parts. Correspondence solicited.
CENTURY TELEPHONE CONSTRUCTION CO.,
1738 Elmwood Ave., Buffalo, N. Y.

$1500 will purchase five-ton Couple Gear Electric Truck, recently overhauled and in fine shape. All tires in perfect condition recently applied. KNOWLTON WAREHOUSE CO., Buffalo, N. Y.

RURAL Parcels Post Delivery Car—Any party with capital and push interested in placing one on the market, correspond with E. P. COWLS, Sparta, Mich.

AUTOMOBILE CYLINDERS reground, new pistons and rings fitted. Garage air compressors. CAST IRON BRAZING CO., Manchester, N. H.

FOR SALE—Brush car, in good running order, complete, with top, extra tire and full equipment of tools; at a bargain. Address P. JONAS, 780 Delaware Ave., Milwaukee, Wis.

$400 BUYS, COST $1,000

Atterbury truck, 1912, half ton, panel top, hard tires, chain drive; sold because owner bought larger capacity. DUKE, 57 East 108th St., New York.

TO EXCHANGE—Mitchell Model G and lot in thriving town of Ashdown, Ark., for Buick roadster, 1911 or 1912 model, or other make as good. Address LOCK BOX 583, Pittsfield, Ill.

ARE YOU in need of any additional help in any department of your business? Are you out of employment or looking for a better connection? Have you second-hand apparatus of any kind or do you want to buy second-hand material. Have you a factory site for sale or do you want to buy one? If so, use the Want and For Sale column of the Motor World. Seven words to the line, fifteen cents a line. Advertisements can be inserted over a number when it is desired and identity of the advertiser will be kept confidential.

BROKEN Cylinders and Crankcases—Send them to be made good as new at fraction of replacement cost. Scored cylinder repaired, $12. No new piston and rings required because bore is not enlarged. Where cylinders are worn (not scored from loose wrist pin) reboring is only remedy. We do it expertly. Write for complete information and estimates. WATERBURY WELDING COMPANY, Waterbury, Conn

WANTED—A first-class man to take the agency for the latest invention on the market, a rubber cover for automobile handles called Steerease; write for full particulars. Address DEPARTMENT E, GOODYEAR RUBBER HOSE AND PACKING CO., 221 Chestnut St., Philadelphia, Pa.

AUTO LISTS, owners, etc., of any State. S. H. CARROLL, JR., Albany, N. Y.

CYLINDERS reground. Pistons fitted. Prompt shipments. HAUBER AUTOMOBILE WORKS, St. Marys, Pa.

FORD OWNERS—Our spare demountable wheel cures tire trouble on the road. Attention, Doctors. Write, ANGIER'S, Streator, Ill.

MORA REPAIR PARTS—We have purchased the repair business of the Mora Cars, including all stock on hand, drawings, patterns, jigs, office records and the right to receive the mail of the company. Owners of Mora Cars will save considerable time by placing their orders for parts directly with us. We have in stock repair parts for all models. PHILADELPHIA MACHINE WORKS, 67 Laurel St., Philadelphia, Pa.

WELDING—Cylinder crank case and crank shaft welded, cylinders rebored, $7.00 to $11.00 a cylinder, including piston and rings. STERLING ENG. CO., 331-333 S. Clinton St., Chicago, Ill.

BROKEN CRANKSHAFTS, cylinders, crankcases, flywheels, gear teeth, pistons, perfectly welded and machined ready to replace. Guaranteed and references. Machinery up to 5 tons welded. ATLAS WELDING WORKS, 74-76-78 Irving St., Rahway, N. J.

FOR SALE—Garage, equipment and business at Hobart, Okla., county seat of 5,000, two railroads, prosperous and growing agricultural section surrounding. Weather and roads such that everybody uses the auto the year round. No tie up for snow and ice. Come or write. D. A. SCOTT, Hobart, Okla.

weekly to the highest degree by our articles on "Wide Awake Merchandising." Look at the cost as shown in the margins.

An ad. like this will cost you 75c. for each insertion.

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A Trade Paper Giving the World's Motor News

Vol. XXXIV
No. 14

New York, March 27, 1913

Ten cents a copy
Two dollars a year

National

STOCK CHAMPION

INTERNATIONAL CHAMPION



500 miles running average 81.72 miles per hour

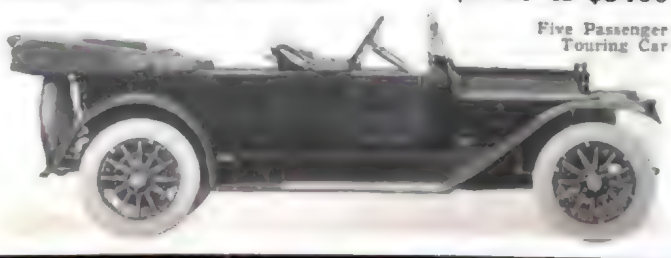
Your Guarantee of Quality and Reliability

IT is you who profit most by our accumulated experience of years of unexcelled success with National cars. Our victories live forever in the character of your car and the way it is built.

National Motor Vehicle Co.
INDIANAPOLIS

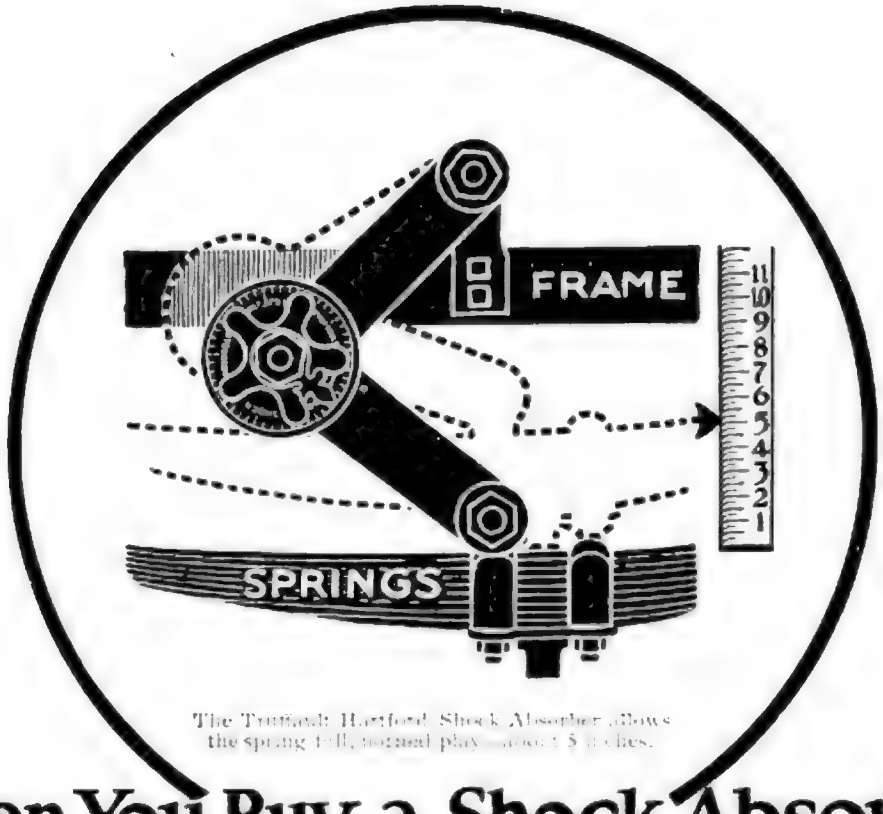
Electric Starter—Electric Lights
Center Control—Left Side Drive

FIVE MODELS
$2750 to $3400



Five Passenger Touring Car

Published Weekly by the Motor World Publishing Company, 1600 Broadway, New York



The Truffault-Hartford Shock Absorber allows the spring full, normal play—about 5 inches.

When You Buy a Shock Absorber
Get the Original—Not an Imitation

There is only one principle upon which to construct a *real* shock absorber. That principle has exclusive application in the Truffault-Hartford.

The Truffault-Hartford controls spring action positively, but unlike others, without limiting the normal, necessary *full* play of the spring.

Full play is only "fair play" if you expect from your springs that flexibility which insures comfort.

Full play is *not* free play. Spring expansion beyond a certain point is dangerous, discomforting, damaging.

Full play is assured—free play is prevented—and comfort is certain if your car is equipped with the Truffault-Hartford—the original shock absorber and the only one *mechanically right*.

Truffault-Hartford equipment on YOUR car means exactly what it means on the cars of 25 leading manufacturers who include it as regular factory equipment—freedom from jolt, jar and vibration; ability to ride any road in ease; absolute protection against spring breakage; more tire mileage and a material reduction in cost of upkeep.

Five Models—Automatic $60—Standard $50—Intermediate $40—Junior $25—Juniorette $15, per set of four respectively.

Write for our catalogue.

HARTFORD SUSPENSION CO., Edw. V. Hartford, *Pres.*

Office and Works, Jersey City, N. J. **Branch Offices and Dealers Everywhere**

Manufacturers of Hartford Self Starter

Truffault-Hartford
SHOCK ABSORBER

The Pioneer Shock Absorber

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Features that will enhance the value of your cars in the eyes of your customers are important selling arguments for you.

If your cars are equipped with R. I. V. Bearings you have a decided selling advantage in the opportunity afforded to inform your customers of this fact.

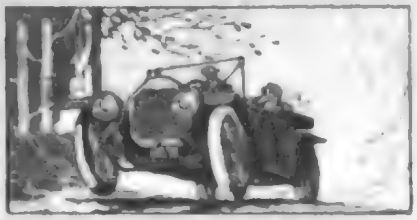
Nearly everyone knows that R. I. V. Ball Bearings are a distinct sign of merit. They indicate to the prospective purchaser that your factory are buyers of quality products in equipping their cars.

R. I. V. Bearings are recognized all over the world as the last word in QUALITY Ball Bearings. Is it not, therefore, to your interest to say that your cars are equipped with bearings whose prestige will help your salesmen in disposing of them?

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Hartford, Conn.

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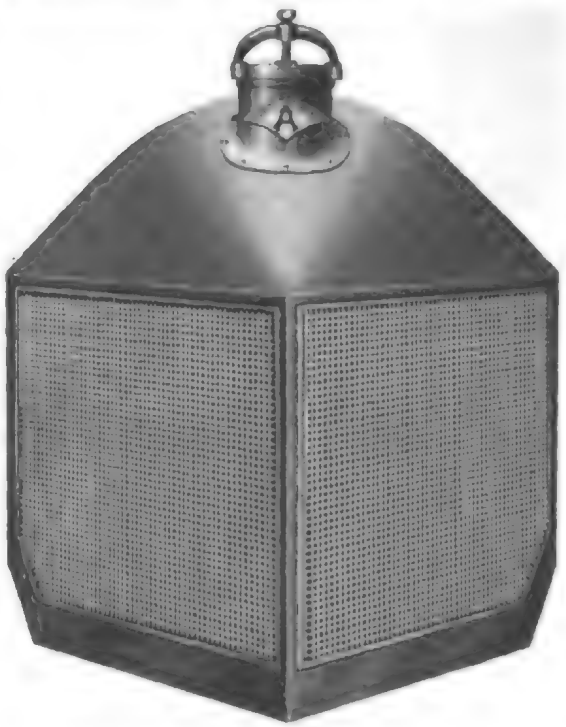
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Fedders Radiators



In producing an all-round efficient car, latter day engineers take no chances on parts that will "lay down" under hard work.

Inefficiency of a part is not blamed on the maker of it—but on the maker of the car.

Fedders Radiators are standard on a large line of America's best known cars and trucks that are making good.

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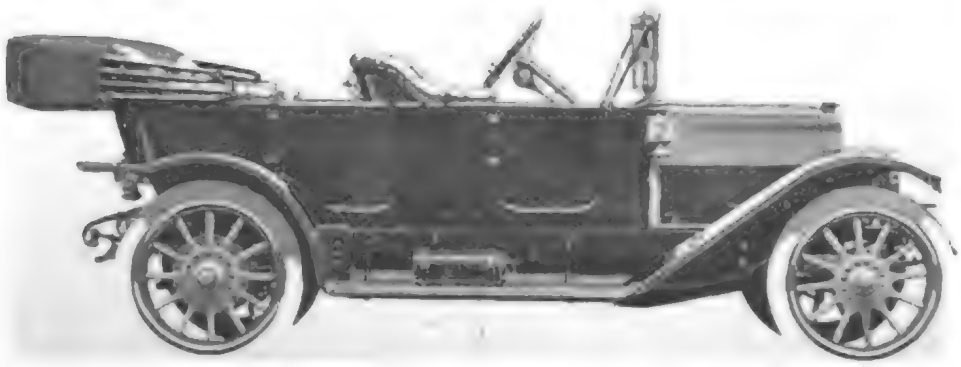
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Warner Speedometer
Mohair Top and Boot
Clear Vision, Rain Vision Windshield
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IN ten years the world's automobile production increased 8,000 per cent. But in six years Overland sales have increased nearly 10,000 per cent. This phenomenal popularity is the greatest proof in the world that in the Overland you get more car for less money than any other manufacturer can give.

For example—study the specifications given above.

Catalog on request. Please address Dept. 50

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MOTOR WORLD

Vol. XXXV New York, U. S. A., Thursday, March 27, 1913 No. 1

LOCK MAKERS ASK COURT TO PROTECT "YALE" TRADEMARK

Declare Two Accessory Dealers Overstepped Bounds in Marketing a Lock Buckle—Value Goodwill at Million Dollars.

Having spent 40 years and thousands of dollars in building up a trade prestige about the name "Yale" as applied to locks, it is quite natural that the Yale & Towne Mfg. Co., of Stamford, Conn., should frown on any attempt by others to place the name "Yale" on any but Yale & Towne locks; and that it is prepared to spend still more money in upholding its claim to the name is indicated in suits which it filed this week in the United States District Court for the Southern District of New York against the General Automobile Supply Co., Inc., and Frederick Ray, F. Arthur Haines and Daniel R. Smith, who are known in the metropolitan accessory trade as Smith-Haines.

The allegation is that the company's rights have been infringed by the sale of the "Lynch Yale Lock Buckle" and the "Yale Lock Principle Buckle," the latter by Smith-Haines and the other by the supply company. The complaint states that the name "Yale" is incorporated in a trademark which was registered July 2, 1907, under the number 63,654.

While the two accessory houses are made the defendants in the suits, they are not the manufacturers, the Yale & Towne company charging that the devices in question are manufactured by the Lynch Mfg. Co. The General Automobile Supply Co. is alleged to have sold its "Lynch Yale Lock Buckle" since October 2, 1912, while the beginning of the Smith-Haines sales dates back as far as February 1, 1911.

In its complaint to the court the Stamford company asks that an injunction issue restraining further sales of the articles named, that an accounting and damages be directed and that all catalogues, literature and advertising matter relating to the devices be destroyed. How the word "Yale" is regarded by the lock manufacturers is shown by its statement that the trademark is worth more than $1,000,000 and that the good-will is of the same value.

Goodyear to Build in Rio de Janeiro.

According to cable advices, the Brazilian government has awarded to the Goodyear Tire & Rubber Co. of South America the contract or right to erect a complete rubber manufacturing plant in Rio de Janeiro, and also for the erection of a rubber washing plant in Manaos, the likelihood of which was reported in Motor World of March 6th. It is provided that the Goodyear Co. of South America, which is capitalized at $3,000,000, shall have the plants erected and in operation one year from the date of signing the final contract.

Maxwell-Briscoe Plant to be Sold.

All doubts concerning the future of the Maxwell-Briscoe branch in Tarrytown, N. Y., have been removed. Immediately following the failure of the United States Motor Co., by which it was owned, the factory was shut down and it has remained idle ever since. It is now announced that it will be sold by the United States Motor Co.'s successor, the Maxwell Motor Co., and though rumor has stated that J. D. Maxwell himself had eyes on his old factory, it is possible to say that he is looking much further west.

Maxwell Formally Takes Over Flanders.

Although it generally had been understood that the Flanders Motor Co. of Detroit already was a part of the Maxwell Motor Co., it transpires that the deal actually was not consummated until late last week, when the Flanders property was formally taken over. Previous thereto it appears that the arrangement between the two companies was of a tentative nature and that, pending the actual transfer, the Flanders company was being operated as a Maxwell branch.

GASOLENE PRICES NOW ON DECIMAL FRACTION BASIS

"Seven Sisters" Legislation in New Jersey Causes Headache Quotations —It Requires Prices to Vary with Transportation Costs.

In New Jersey, the gasolene situation, at least so far as prices are concerned, has taken a peculiar turn, which may or may not result in the sale of the very necessary fuel at varying prices throughout the State. Certainly it has already resulted in a general revision of wholesale quotations, which are so finely drawn in decimal fractions that it will put dealers and garagemen to some pains to check their invoices correctly. Unless the New Jersey legislature sees fit to step into the breach, even 1/100 of a cent hereafter will figure in the price.

This unusual state of affairs is one of the immediate effects of what was termed the "Seven Sisters" legislation, which was fathered by Governor Wilson before he relinquished that office to become President of the United States and which was aimed to correct certain corporation abuses. The particular section of the law which has caused resort to decimal fractions follows:

"It shall be unlawful for any person, firm, corporation or association, engaged in the production, manufacture, distribution or sale of any commodity of general use, or rendering any service to the public, to discriminate between different persons, firms, associations or corporations, or different sections, communities or cities of the State, by selling such commodity or rendering such service at a lower rate or price at a point away from that of production or manufacture as at the place of production or manufacture, after making due allowance for the difference, if any, in the grade, quality or quantity and in the actual cost of transportation from the point of production or manufacture, if the effect or intent thereof is to establish or maintain a virtual

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monopoly, hindering competition, or restriction of trade."

On Sunday last, immediately after the law became effective, the Standard Oil Co. of New Jersey announced that in order to comply with it, it had been found necessary to make new selling prices on all of its various products, which, of course, include gasolene, kerosene and lubricating oil. As an example, the big company cited the price of what is known as "tank wagon water white kerosene oil." In Bayonne, the manufacturing point, the Standard Oil Co.'s price is 8½ cents per gallon, and as the freight rate to Newark is 3 cents per barrel of 50 gallons, the Standard Oil Co.'s Newark price automatically became 8.56 cents per gallon.

In the notice to its customers announcing the revision of its prices, the Standard Oil Co. of New Jersey remarks that the law "very properly contemplates a uniform price for petroleum products in every part of the State, subject only to difference in transportation rates from the point of production, manufacture or distribution to the various points of consumption," and points out that "an analysis of the prices to be thus charged in 70 consuming centers for tank wagon deliveries of illuminating oil and gasolene, indicates that in the majority of these localities the prices charged will be fractionally higher rather than lower as compared with prices hitherto prevailing.

"Literal compliance with the new law involves invoices or calculations which include varying cumbersome fractions of one cent, which must prove alike embarrassing to consumer and distributor," continues the statement.

"Could this not be obviated to the convenience of all and with injury to none by authorizing (through legislative amendment) invoices at only full cents and half-cents? For example: If the Bayonne price were 8½ cents and the freight 39/100 of a cent, then the invoice should be at 9 cents instead of 8.89/100 cents per gallon; but if the Bayonne price were 8½ cents and the freight 1.17/100 cents, then the invoice should be at 9½ cents instead of 9.67/100 cents per gallon.

"As the legislature, of course, did not intend to embarrass the detail of this important commerce, our suggestion may not be regarded as inopportune."

Chandler Secures Site in Cleveland.

The Chandler Motor Car Co., which recently was organized by former Lozier department heads, has acquired a six-acre site on St. Clair and 131st streets, Cleveland, Ohio, on which will be immediately erected a steel and concrete building, 420 x 120 feet. It will be ready for occupancy July 1st.

COMMISSION REFUSES LOWER RATE TO CANADA ON CHASSIS

Upholds Rate Established After Buick Assembler Lodged Complaint with Interstate Commerce Commission—Points Involved.

Efforts of the McLaughlin Motor Car Co., Ltd., which reproduces the Buick car in Oshawa, Ont., to secure the same freight rates on parts constituting a complete automobile as apply on agricultural machinery, vehicle stocks and certain automobile parts, have failed.

The effort was made through the United States Interstate Commerce Commission and took the form of a complaint against the Grand Trunk Railway Co. of Canada which was filed November 13, 1911. It, however, just has been decided by the commission, which, while awarding reparation to the McLaughlin company, declines to order the railroad to institute the rate of 23½ cents per 100 pounds, which governs shipments of agricultural machinery and the like. A rate of 37½ cents per 100 pounds having become effective since the complaint was filed, this latter rate is held to be just and reasonable.

For the purposes of the case, a typical shipment of 10 complete chassis, knocked down and boxed, and which constituted a carload of 16,400 pounds, was cited, on which the first class rate of 51 cents per 100 pounds had been imposed. That rate covers "Vehicles, self-propelling, without bodies," and was applied to complete automobiles, whether set up or knocked down. In rendering its decision, the United States Interstate Commerce Commission wrote as follows:

"The Commission's decision in Auto Vehicle Co. v. C., M. & St. P. Ry. Co., 21 I. C. C., 286, which complainant refers to in support of its contention that the rate charged should not exceed fourth class, involved the transportation of various metal automobile parts from Milwaukee, Wis., to Los Angeles, Cal., governed by the Western classification, and did not relate to completely manufactured automobile chassis knocked down for the purpose of shipment.

"The automobile chassis, which in the present instance were thoroughly tested on a track or by machinery prior to shipment, are stated to be of greater value than the various parts thereof not forming a complete chassis. Moreover, automobile chassis might well be accorded a higher rate than the various other articles of machinery referred to by the complainant. We do not believe, however, that automobile chassis knocked down should be charged as high a rate as that provided for chassis set up or for complete automobiles.

"Considering all the facts and circumstances disclosed by the record, we are of the opinion and find that the charges collected on complainant's shipments were unreasonable to the extent that they exceeded a rate of 37½ cents per 100 pounds, minimum weight 15,000 pounds, but as this rate has been in force for over 16 months, no order prescribing a rate for the future is deemed necessary. We also find that in so far as complainant has paid freight charges upon the basis herein found to be unreasonable, it has been damaged to the extent that such charges exceeded what would have been collected on the basis herein found reasonable, and that complainant is entitled to reparation accordingly. Upon receipt of a statement of the shipments of complainant and its verification by the carrier and approval by the Commission, an order of reparation will be entered."

Chevrolet Not to Leave Detroit.

Although advertisements appearing in the Detroit papers and offering for sale "the building now occupied by the Chevrolet Motor Co. on West Grand Boulevard" in that city, have given rise to a variety of rumors, it is not the intention of the Chevrolet people to vacate the property, or to remove to Flint, Mich., as has been reported.

The building is owned by the Corcoran Lamp Co. and the method of advertising it is merely the real estate broker's idea of attracting attention to the property. It is under lease to the Chevrolet Motor Co., and whether or no the building is sold the present tenants will continue to occupy it.

Weed to Concentrate in Bridgeport.

The Weed Chain Tire Grip Co., of New York, has purchased additional property, between Locust and Hewitt streets, in the east end of Bridgeport, Conn., and is preparing to concentrate its manufacturing in that city, which means that the Oneida Community chain plant, which Weed acquired last summer, will be removed to the Connecticut city. Two property owners in the immediate location presented objections to the closing of certain streets, but the Bridgeport authorities bowled them over and acceded to the Weed request that the streets involved be closed.

Winton Advances Wages 10 per Cent.

The Winton Motor Carriage Co. last week announced a 10 per cent. wage increase applying to all grades of labor in its Cleveland plant. It was purely voluntary on the part of the company and will joyously affect some 1,100 employes.

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SMELTER MAN IS HEAVIEST BUYER AT THOMAS AUCTION

Secures Good-will and Parts and Also Around-the-World Trophy—Cars Bring $1,900 Each—Six-Day Sale Nets $250,000.

Sentiment played no part in the receivers' sale of the assets of the once-proud E. R. Thomas Motor Car Co., in Buffalo, which was concluded on Saturday last, 22nd inst. The very last article disposed of was the imposing trophy won by the Thomas car in the more or less memorable race around the world in 1906, which was promoted jointly by the New York Times and the Paris Matin. It was purchased for $300 by C. A. Finnigan, manager of the Empire Smelting Works, of Depew, N. Y., which may or may not indicate that a smelting pot will mark the finish of the trophy.

Finnigan was the largest individual purchaser of Thomas goods. Paying $51,000 for them, he bid in the good-will and the repair shop and stock room and their contents. What Finnigan will do with the property is a matter of speculation. He was once engaged in the automobile business in Kentucky, and that fact has given rise to reports that he may again embark in the automobile industry, using his Thomas purchases as a basis.

The auction was largely attended and all of the nearly 6,000 lots offered on the block were disposed of by the auctioneer, J. E. Conant, of Lowell, Mass. The repair parts and factory scrap were purchased by the Shiffmann Iron & Metal Co., of Detroit, for $6,000, while 15 high-priced Thomas cars brought $1,900 each.

The sale netted a total of $256,467, the value of the goods disposed of being appraised at $559,000. The first day's sale realized $84,500, the second day $17,400, the third day $72,200, the fourth day $49,300, the fifth day $11,300, and the sixth day $21,767.

George Finley, of Buffalo, one of the Thomas company's receivers, states that it will be about two weeks before a settlement with the creditors can be made.

Lozier Recapitalized at $5,000,000.

As was practically a foregone conclusion, the stockholders of the Lozier Motor Co., of Detroit, have authorized the increase of the company's capital from $3,000,000 to $5,000,000. The new shares consist of $1,000,000 7 per cent. cumulative preferred and $1,000,000 common stock, making the company's capital stock consist of $3,500,000 common and $1,500,000 preferred. A large part of the new preferred already has been subscribed by the Lozier stockholders, it having been offered for subscription at par. The new common will be retained in the treasury for use in conversion of the preferred. According to President Jewell, the added capital was required to facilitate the increased business that followed the launching of the Lozier light "six."

Tornado Hits Omaha's "Automobile Row."

The tornado which made a path of ruin through Omaho, Neb., last week did not slight Farnam street, which thoroughfare is the site of numerous automobile establishments; while considerable damage was sustained by salesrooms and garages, the greatest loss befell the Electric Garage and the Packard Garage, both at Farnam and 40th streets. The former building was completely demolished and scattered to the four winds and two men were killed; many cars in storage were transformed into junk; the loss is estimated at $200,000. The Packard Garage suffered similarly, many cars being smashed when the building was torn apart.

Employes' Testimony Must be Oral.

If the Parish & Bingham Co., of Cleveland, Ohio, desires to have the testimony of any of its factory employes introduced as evidence in a suit the frame company has brought in the New York Supreme Court in Queens county against the Palmer & Singer Mfg. Co., of Long Island City, the men must be taken into court and made to give oral testimony. This ruling was made this week when the court denied the Parish & Bingham company's request that it be permitted to take the testimony in Cleveland in order to avoid the expense of bringing the men to New York. The Cleveland concern asks $15,067.35, alleged to be due on goods delivered on a contract.

Wants Iowa Freight Rates Readjusted.

In behalf of the automobile interests of the State, E. G. Wylie, rate commissioner for the Greater Des Moines committee, has filed with the Iowa State Board of Railroad Commissioners a petition for the equalization and correction of the freight rate classification governing shipments of automobiles. It is alleged that motor cars can be shipped across the State from points in Illinois and Nebraska for less than is charged for intermediate service over the same lines.

Cole to Erect Four-Story Addition.

The Cole Motor Car Co. is inviting bids, making ready to erect a four-story addition to its plant in Indianapolis. The work probably will begin May 1st and the building be ready for occupancy October 1st. It will represent a cost of $150,000.

NO PATENT MONOPOLY ON WRAPPED TREAD APPARATUS

Court of Appeals Declares Thropp Patent Was Anticipated—Four-Year Fight Ends in Victory for Fisk Company.

After four years' litigation, the United States Circuit Court of Appeals for the First Circuit, which sits in Boston, has confirmed the decision of the lower court in favor of the Fisk Rubber Co. in the suit involving the molds used in the manufacture of tire casings by the one cure wrapped tread process.

The suit against the Fisk company was brought by the De Laski & Thropp Circular Woven Tire Co., of Trenton, N. J., and alleged infringement of the P. D. Thropp patent No. 822,561, of June 6, 1906, which invention "relates more particularly to apparates holding a clincher tire in position during the vulcanizing process," although it does not assert novelty in such process.

The chief advantage of the Thropp patent was that it claimed to permit the production of what has come to be known as the "wrapped tread" tire as distinguished from the molded tire.

In its defense, the Fisk company set up that the Thropp patent was invalid by reason of anticipation, which defense was upheld by the United States District Court in Massachusetts and finally, as stated, by the Circuit Court of Appeals, which latter held that the Thropp device had been clearly anticipated by drawings and molds made by the B. F. Goodrich Co. previous to April, 1905.

The Thropp interests claimed that the Goodrich devices were mere experiments but the Court of Appeals held that that proof of anticipation "seems to us clear, unequivocal and convincing."

Cordner Becomes Vaughan's President.

A. B. Cordner, who several months since retired from the General Motors Truck Co., has been elected president of the Vaughan Car Co., of Kingston, N. Y., which recently was incorporated with an authorized capital of $1,350,000, to continue the manufacture of the car of that name. The other officers of the Vaughan company are F. E. Muskovics, vice-president and general manager; E. S. Partridge, vice-president and sales manager; and H. W. Johns, of the Johns-Manville Co., secretary and treasurer. The Vaughan car itself has been redesigned and when it makes its reappearance it will be in the form of a six-cylinder model listing in the neighborhood of $2,500, fully equipped.

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INCREASE OF 14 PER CENT IN FIRST MONTH'S EXPORTS

Shipment of Cars Gains $278,787 Over January of Last Year — France Leads All Divisions in Percentage of Increase.

The export of cars, parts, engines and tires during January of this year gained 20 per cent. over the value of these products exported in the initial month of the calendar year 1911, as was previously stated in Motor World, but according to detailed statistics just issued by the Federal government, the export of cars themselves did not quite reach that figure. The January shipments of cars increased by 110, or 5 per cent., in number, and by $278,787, or 14 per cent., in value. Parts, of themselves, showed a loss of $38,665, or 8 per cent., which brings the total monetary gain for cars and parts down to $240,122, or 10 per cent.

Of the 12 geographic divisions into which the export statisticians divide the world, South America leads for January, with a gain of 164 in number and $151,543 in value, 88 and 63 per cent., respectively; but when percentage increases are considered France moves from the tail-end position it held in December and leads with an increase of 265 per cent., represented by 53 cars, and 393 per cent., which is $47,233; and this country is followed in order by the West Indies and Bermuda, 240 per cent.; Asia and Other Oceania, 181 per cent.; Other Countries, 142 per cent., while British Oceania foots the list with ¼ per cent.

In percentage of values gained France is followed by Germany, 380 per cent.; Italy, 341 per cent.; West Indies and Bermuda, 292 per cent., while Canada, 23 per cent., was last. Losses were shown in number and value by the United Kingdom, Other Europe and Mexico, and in value by British Oceania.

The Philippines and Hawaii continue to be the most active of the non-contiguous American possessions in buying cars; the Philippines led with a gain of 34 cars, or 189 per cent., and its gain of $31,485 is 175 per cent. Hawaii's gains were 18 cars, or 33 1-3 per cent., and $65,621, or 22 per cent. Porto Rico's figures are small and Alaska for January had none. The total of cars shipped to the possessions in January, 170 valued at $275,073, was greater by 56 cars and $97,797 than the shipments of the preceding January, respective percentages of 49 and 55. The exports of cars and parts to all lands in January gained 166 cars, or 8 per cent., and $337,919, or 18 per cent.

For a period of seven months, ending with January, 1913, the number of cars shipped to foreign countries increased 2,306, or 22 per cent., while the grand total of cars and parts to all countries gained $3,101,400, or 23 per cent. The average value per car to foreign countries in January was $1,036 and to the possessions $1,507.

Engine exports for the two Januaries were: 1912, 837, $102,028; 1913, 1,705, $285,316, gains per cent. of 104 in number and 179 in value, as previously stated. Tire exports were: January, 1912, $161,337; 1913, $273,519, a gain of 69 per cent. The figures in detail follow.

	—January—				—Seven Months Ending January—					
	1912		1913		1911		1912		1913	
	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.	Quantities.	Values.
France	20	$12,012	73	$59,245	83	$216,292	200	$180,513	377	$289,188
Germany	15	8,874	27	42,659	43	133,397	73	56,563	247	231,035
Italy	12	8,093	20	35,660	43	64,630	83	58,673	168	150,253
United Kingdom	719	508,324	374	258,463	708	1,020,037	3,104	2,453,748	1,683	1,268,110
Other Europe	119	106,801	53	61,937	224	328,975	466	403,461	726	622,542
Canada	404	481,413	468	593,700	1,670	1,821,246	1,957	2,475,068	3,154	3,886,394
Mexico	46	64,973	35	48,619	238	427,568	203	315,235	193	339,305
West Indies and Bermuda	20	17,377	68	68,104	157	213,797	166	171,680	255	263,857
South America	187	241,536	351	393,079	332	380,945	907	1,061,857	1,661	1,842,300
British Oceania	402	402,199	403	386,833	825	679,499	2,108	1,918,716	1,869	1,714,328
Asia and Other Oceania	65	72,536	193	182,660	354	411,334	492	515,099	1,133	1,068,437
Other Countries	38	32,152	92	103,118	140	147,502	185	179,281	551	546,582
Total cars	2,047	$1,955,290	2,157	$2,234,077	4,817	$5,845,222	9,944	$9,789,894	12,017	$12,222,531
Parts*	....	472,501	....	433,936	....	1,063,124	.....	2,080,299	.....	2,538,608
Total cars and parts	2,047	$2,427,891	2,157	$2,668,013	4,817	$6,908,346	9,944	$11,870,193	12,017	$14,761,139
To American Possessions—										
Hawaii—Cars	54	85,871	72	151,492	230	453,214	255	464,203	411	691,961
Parts*	....	4,954	....	7,393	....	28,045	.....	44,008	.....	64,260
Porto Rico—Cars	42	51,410	46	55,221	151	308,780	243	367,182	215	264,576
Parts*	....	15,244	....	10,423	....	63,872	.....	72,374	.....	56,134
Philippines—Cars	18	17,980	52	49,465	212	277,053	163	230,884	271	321,762
Parts*	....	1,305	....	684	....	48,392	.....	31,744	.....	21,562
Alaska—Cars	....	.....	....	.....	1	850	8	6,910	5	8,050
Parts*	....	512	....	305	....	968	.....	2,422	.....	1,870
Total	114	$177,276	170	$275,073	594	$1,181,174	669	$1,219,727	902	$1,430,181
Grand total	2,161	$2,605,167	2,327	$2,943,086	5,411	$8,089,520	10,613	$13,089,920	12,919	$16,191,320

* Does not include engines and tires.

JANUARY IMPORT OF CARS SHRINKS BY 12 PER CENT

America's Foreign Purchases Are Thirteen Cars Less Than a Year Ago—But Import of Parts Increases 46 per Cent.

But for heavy losses recorded by France and the United Kingdom in their shipments of cars to the United States during January, that month as compared with the same period of 1912 would have shown a gain—something which has not occurred in imports in some time; as it was, the imports decreased by 13 cars only, which is 15 per cent., and in value by $24,508, or 12 per cent.

Germany's gain in percentage was large, the 15 cars which it added to its shipments being equivalent to 250 per cent., and even in value, which gained by $20,780, the percentage rise was 149. Although car imports lost, parts imports, as previously stated in Motor World, gained $12,543, or 46 per cent. The losses of France and the United Kingdom were, in value, respectively 44 and 56 per cent. For the seven months ending with January, the gains were 108 cars, or 17 per cent., and $174,884, or 11 per cent. The figures in detail are:

	January, 1912.		January, 1913.	
	Number.	Values.	Number.	Values.
France	38	$102,770	24	$57,649
Germany	6	13,955	21	34,735
Italy	10	11,942	10	18,222
United Kingdom	25	58,341	8	25,401
Other Countries	5	12,189	8	18,682
Total cars	84	$199,197	71	$174,689
Parts (except tires)	..	25,145	..	37,688
Total cars and parts	84	$224,342	71	$212,377

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The Week's Incorporations

Pasadena, Cal.—Kendal Auto Co., under California laws; authorized capital, $50,000; to deal in motor cars.

Hartford, Conn.—Crown Motor Co., under Connecticut laws; authorized capital, $6,000; to deal in motor cars.

Charlotte, N. C.—Lyerly Motor Co., under North Carolina laws; authorized capital, $15,000; to deal in motor cars.

Galveston, Tex.—Galveston Motor Car Co., under Texas laws; authorized capital, $3,000; to deal in motor cars. Corporators—R. S. Carter, L. Carter, G. G. Lescher.

Sempronville, Ky.—Farmers' Supply Co., under Kentucky laws; authorized capital, $5,000; to deal in motor cars. Corporators—L. G. Baskett, A. S. Frazier, J. C. Johnson.

Austin, Tex.—Texas Motor Car & Truck Co., under Texas laws; authorized capital, $10,000; to deal in motor cars. Corporators—John C. Fink, A. A. Ritcheson, W. T. Folts.

Gas City, Ind.—Date-Mode Tire & Tube Co., under Indiana laws; authorized capital, $5,000; to manufacture tires. Corporators—M. J. Hontz; O. V. Shober, Jesse D. Hontz.

Chicago, Ill.—De Launty Engine Co., under Delaware laws; authorized capital, $1,000,000; to manufacture motors. Corporators—H. R. Wilson, J. M. Snitzler, P. L. Kneedler.

Trenton, N. J.—Brock's Garage, Inc., under New Jersey laws; authorized capital, $100,000; to operate a garage. Corporators—J. L. Brock, H. K. Brock, H. P. Brock, all of Trenton.

Lawrenceville, Ill.—Lawrenceville Auto Co., under Illinois laws; authorized capital, $16,000; to deal in motor cars—Corporators—Fred B. Childress, Allan C. Stolz, Nellie S. Childress.

Milwaukee, Wis.—Escott's Auto Livery & Garage Co., under Wisconsin laws; authorized capital, $15,000; to operate a motor livery. Corporators—F. A. Escott, Clara A. Estcott, R. S. Witte.

Memphis, Tenn.—Loeb Auto Co., under Tennessee laws; authorized capital, $5,000; to deal in motor cars. Corporators—Henry Loeb, E. F. Goldsmith, Charles Loeb, Walter Loeb, Elias Gates.

Akron, Ohio—Summit Auto Co., under Ohio laws; authorized capital, $10,000; to deal in motor cars. Corporators—E. J. Eblen, J. M. Lauder, F. L. Metz, Rachale Lauder, Almira Eblen.

Washington, D. C.—Washington Motor Car Co., under Delaware laws; authorized capital, $5,000; to deal in motor cars. Corporators—W. F. P. Lofland, W. I. N. Lofland, J. S. Collins, Jr.

Cincinnati, Ohio — Armstrong Motors Co., under Ohio laws; authorized capital, $10,000; to deal in motor cars. Corporators—James H. Armstrong, Luella S. Armstrong, Clara M. Engers.

Wilmington, Del.—National Graphite Lubrication Co., under Delaware laws; authorized capital, $3,000,000; to deal in graphite lubricants. Corporators—F. D. Buck, G. W. Dillman, B. M. Grawl.

Whitestone, N. Y.—Whitestone Garage, Inc., under New York laws; authorized capital, $5,000; to operate a garage. Corporators—Herbert A. Trotman, John A. O'Fee, Mary E. O'Fee, all of Whitestone.

Dover, Del—Storage Battery & Equipment Co., under Delaware laws; authorized capital, $300,000; to manufacture storage batteries. Corporators—W. F. P. Lofland, W. I. N. Lofland, J. S. Collins, Jr.

Newark, N. J.—Automobile Leather Mfg. Co., under New Jersey laws; authorized capital, $150,000; to manufacture leather goods for motor car use. Corporators—W. A. Smith, F. I. Ennis, T. G. Woodruff.

Baltimore, Md.—Baltimore Electric Storage Battery Co., under Delaware laws; authorized capital, $2,500,000; to manufacture storage batteries. Corporators—S. S. Adams, Jr., J. G. Gray, M. B. F. Hawkins.

Patchogue, N. Y.—John R. Swezey Automobile Co., Inc., under New York laws; authorized capital, $5,000; to deal in motor cars. Corporators—John R. Swezey, Nathaniel N. Swezey, Ella B. Swezey, all of Patchogue.

New York, N. Y.—Auto-Signalite Co., Inc., under New York laws; authorized capital, $2,000; to manufacture motor car devices. Corporators—Robert C. Norton, Anna D. Chersan, Delema E. Koblish, 1 Liberty street.

New York, N. Y.—Brady Murray Motors Corp., under New York laws; authorized capital, $55,000; to deal in motor cars. Corporators—Arthur T. Murray, 30 Church street; Samuel T. Marcus, Charles Wein, 30 Broad street.

Cleveland, Ohio—Cleveland Motor Trucking Co., under Ohio laws; authorized capital, $10,000; to operate a motor delivery. Corporators—J. Charles Ross, C. B. Goetzfried, C. A. Cochran, Robert W. Blake, Henry Eckhoff.

Toledo, Ohio—Parsons Mfg. Co., under Ohio laws; authorized capital, $10,000; to manufacture motor car appliances. Corporators—George R. Seney, Irvin E. Austin, Charles W. Parsons, Henry T. Parsons, Helen W. Keier.

New York, N. Y.—Henry Tobin Co., Inc., under New York laws; authorized capital, $50,000; to deal in motor cars. Corporators—Henry Tobin, 166 West 72nd street; Richard F. Tobin, Joseph B. McDonough, 777 West End avenue.

New York, N. Y.—Charles E. Hottum, Inc., under New York laws; authorized capital, $20,000; to deal in motor car apparel. Corporators—Charles E. Hottum, Maud J. Hottum, William H. Coffey, all of 12 West 33rd street.

Mt. Vernon, N. Y.—Motor Truck Mfg. Corp., under New York laws; authorized capital, $150,000; to manufacture motor trucks. Corporators—Arthur J. Albert, Hoboken, N. J.; Henry Hilchenbach, Louise Bertsch, Mt. Vernon.

Minneapolis, Minn.—Automobile Owners' & Drivers' Protective Association, under Minnesota laws; authorized capital, $50,000; to conduct a protective association. Corporators—W. H. Settzler, Richard Footman, E. G. C. Montgomery.

Utica, N. Y.—Divine Tire Co., under New York laws; authorized capital, $225,000; to manufacture tires. Corporators—Charles W. Wicks, 770 Genesee street; A. James Eckert, 108 Genesee street; Bradford H. Divine, 202 Whitesboro street.

New York, N. Y.—Associated Auto Mechanics, Inc., under New York laws; authorized capital, $100,000; to deal in motor cars and parts. Corporators—Charles Tichenor, 21 Spruce street; Harry Barnes, Wm. J. Hoover, 10 East 42d street.

New York, N. Y.—Petler Shock Absorber Corp., under New York laws; authorized capital, $50,000; to manufacture motor car devices. Corporators—James L. Allen, 580

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West 161st street; Charles L. Moreau, Frederick O. Lyon, 208 West 85th street.

New York, N. Y.—Approved Auto Specialties Co., Inc., under New York laws; authorized capital, $10,000; to manufacture motor car devices. Corporators—Katharine D. Brandreth, 55 East 7th street; John B. Brandreth, Edward C. Phelps, 1731 Broadway.

New York, N. Y.—Dayton Automobile Repairing Co., Inc., under New York laws; authorized capital, $5,000; to repair motor cars. Corporators—Charles E. Holste, Elizabeth, N. J.; Victor Drummond, Bayonne, N. J.; Valentine E. Mott, Jamaica, N. Y.

Cincinnati, Ohio—Cincinnati Motordrome & Amusement Co., under Ohio laws; authorized capital, $15,000; to build and operate a motor race track. Corporators—Chas. P. Salen, Jake Mintz, S. J. Mueller, J. H. Smith, M. F. Bramley, H. J. Conover, J. H. Rush.

Brooklyn, N. Y.—Ackerman & Baird, Inc., under New York laws; authorized capital, $10,000; to manufacture motors. Corporators—Raymond P. Ackerman, Hotel St. George; Andrew D. Baird, 578 Madison street; Andrew D. Baird, 2nd, 140 Hewes street.

New York, N. Y.—Seeing New York Automobiles, Inc., under New York laws; authorized capital, $10,000; to operate sightseeing motor cars. Corporators—Geo. H. Mulligan, Hotel Avon; Thomas Frost, 235 East 26th street; Joseph V. Fallon, 344 East 42nd street.

Brooklyn, N. Y.—Peerless Radiator & Auto Lamps Works, Inc., under New York laws; authorized capital, $5,000; to manufacture motor car parts. Corporators—Max Stadlen, 544 St. Paul's Place; Louis Shapiro, 1012 Bedford avenue; Bernard Wolfensohn, 1442 Charlotte street.

New York, N. Y.—New York & New Jersey Seaton Wheel Co., Inc., under New York laws; authorized capital, $350,000; to manufacture spring wheels. Corporators—John T. Landis, Nashville, Tenn.; William C. Mack, 623 Third street, Brooklyn; William T. Rainey, Caldwell, N. J.

Brooklyn, N. Y.—National Auto Radiator & Lamp Works, Inc., under New York laws; authorized capital, $10,000; to manufacture motor car parts. Corporators—Jacob Samas, 230 Skillman street; Julius Pasternack, 75 East 111th street, New York City; Milton J. Gordon, 12 West 92nd street, New York City.

Changes of Capitalization.

Elyria, Ohio—Dean Electric Co., from $4,000,000 to $2,000,000.

Memphis, Tenn.—Blomberg Automobile Co. from $10,000 to $30,000.

PROMINENT MEN IN TRADE WHO ASSUME NEW DUTIES

Resignations and Promotions That Serve To Place Many Workers In New Places—Few Leave the Industry.

F. R. Bump has resigned as sales manager of the R. C. H. Corporation, of Detroit. His successor has not yet been chosen.

M. L. Bricker has been promoted to the post of production manager of the Briggs-Detroiter Co., of Detroit. Previously he was its superintendent.

James G. Smith has been appointed manager of the Motz Tire & Rubber Co.'s New York branch. Previously he was in turn connected with the Goodyear and Gibney companies.

Thomas G. Craig has been appointed sales manager for the Universal Wheel Co., of Detroit, which is producing a demountable wheel. Previously Craig was engaged in the stock brokerage business in Detroit.

Guy Vaughan, who designed the original car of that name but who latterly has been attached to the engineering staff of the Olds Motor Works in Lansing, Mich., has signed up with the F. B. Stearns Co., of Cleveland. He will, of course, be one of the Stearns engineering experts.

J. V. Hall, former sales manager of the Olds Motor Works, of Lansing, Mich., who was transferred to the Pacific Coast several months ago, where he took charge of the Olds branch, will return to the factory and resume his former duties. O. C. Hutchinson, who at about the same time was appointed vice-president and general manager, has relinquished the latter office and will go to Detroit, where he will serve as Olds representative.

Court Frees "White Elephant" Fords.

Those thirteen Ford Model T's which became a white elephant on the hands of the Atantic Transport Co. because of a suit in the Supreme Court for New York county by the Ford Motor Co. against Bowring & Co., New York exporters, have been taken from the hands of the steamship company and they may now proceed toward New Zealand. The Appellate Division of the Supreme Court this week upheld the lower court, which vacated an attachment secured by the Ford company against the cars and declared inoperative an agreement between Ford and the Atlantic company whereby the latter was to keep the cars until the suit was settled.

Ford claimed the cars were intended for the Ford dealer in Chili, but were secured by Bowring through a roundabout channel and consigned to New Zealand, which was construed as an unlawful invasion of the Ford New Zealand dealer's territory. After the attachment was secured the steamship company agreed to keep them in its possession throughout the suit if the ship were permitted to sail.

White Loses in Delivery Body Case.

A score of White delivery cars have been running about New York City in the service of Gimbel Bros. and have helped straighten out many kinks in the department store's delivery problem, but all through their period of service the delivery bodies upon them have remained an article of dispute in a suit in the New York City Court; the complainant was George B. Marx, a body builder, of Greenpoint, N. Y., and the defendant was the White Co., of Cleveland, Ohio. This week the suit was ended with a verdict of $1,489.58 in favor of Marx.

The action had its beginning about six months ago, when Marx fitted bodies to the 20 White chassis and the cars were turned over to the department store; when the matter of payment came up a settlement out of court proved impossible. The White Co. claimed it paid all it should pay and Marx demanded a balance amounting to the verdict rendered.

Fanning's Lawyer is Bergdoll's Receiver.

Growing out of the bankruptcy petition filed against the Louis J. Bergdoll Motor Co., of Philadelphia, on the 17th inst., Frank J. Harrington, an attorney, was appointed receiver of the company on Thursday last, 20th inst. Harrington was the attorney for Frank Fanning, who was a one-time Bergdoll sales manager and who levied on all the available funds, which action brought about the seizure of the contents of the Bergdoll factory and precipitated the bankruptcy proceedings.

Perfection Men in Toledo Enterprise.

Interests identified with the Perfection Spring Co., of Cleveland, have acquired a 5½-acre site in Toledo on which will be erected a plant for the manufacture of springs, chiefly for the John N. Willys's factories. The Perfection plant in Cleveland will be continued, and it is probable that the Toledo enterprise will be conducted under an entirely different corporate title.

Garageman Sued by Hess-Bright.

Goods and court fees make up a judgment which was filed this week in the New York county clerk's office by the Hess-Bright Co. against the Manchester Garage Co., of New York City. The amount is $33.19.

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In the RETAIL WORLD

O. R. Buford has opened a garage in Anna, Ill.

Kephart Bros. will erect a garage in Lakeville, Minn.

Lon De Peel is about to open a garage in Presho, S. D.

Kelch & Sharp, of Los Angeles, Cal., will build a new garage.

J. H. Williams is about to open a repair shop in Abilene, Kan.

Charles Nelson is about to enter the garage trade in Junction City, Ore.

Ward C. Parsons, of Unionville, Conn., is about to open a garage in that town.

The Sibley Motor & Sales Co. plans to build a new garage in Worthington, Minn.

J. Vavricka, formerly of Batin, Neb., is about to open a garage in Crete, in the same State.

Benjamin Davy, of Wilkesbarre, Pa., has had plans prepared for a new garage. He will build it on Loomis street.

MacFarlane & Meyham is the style of a new repair firm in Berkley, Cal. The shop is located at 1919 Allston Way.

E. A. Bleck has opened up in Lima, Ohio, at 125 South Elizabeth street. He will stock accessories and Overland cars.

M. Orgens and Oliver Ostlund have formed a copartnership in Kerkhoven, Minn., and will operate a garage.

O. E. Bickford has established a garage business in Fitchburg, Mass., at 100 Main street. He will stock accessories.

J. A. Graves, of Los Angeles, Cal., has awarded the contract for a two-story garage. The estimated cost is $50,000.

Guy Ginther, of Lemmon, N. D., has taken over the garage business of Walter Smith, in Mott, in the same State.

The Wilton Automobile Co. has been formed in Wilton, N. D. It will erect a garage and repair shop and conduct an agency.

Neyhart & Green have taken over the Sixth Street Garage in Stroudsburg, Pa. The building will be enlarged and improved.

C. E. Glidden, of Sisson, Cal., has purchased an interest in the Sisson Garage. The future style will be C. E. Glidden & Sons.

Simpson & Huffman and Earl Moore are about to establish a garage business in Columbus, Ohio. They will locate at 237 North 4th street.

Guy Stansbury, of Fort Madison, Ia., plans to enter the garage and repair trade in that town. Quarters are being prepared for him at 811 Front street.

Thomas H. Roche, formerly of the Dwyer & Roche Co., has opened a repair shop in Hartford, Conn. It is located at 16-18 Park street.

Himmelberg & Cochran, proprietors of the Glasgow (Mo.) Garage, have become dealers. They have taken the Cartercar agency.

The Texas Motor Car & Supply Co., of Galveston, Tex., has sold its Victoria (Tex.) branch to John Frazer, of Cuero, in the same State.

Paul J. Wisdom, of Santa Ana, Cal., will erect a new garage, to cost $5,000. He is a sub-dealer under the Cole Motor Co., of Los Angeles.

The Swaney Auto Co., of Carroll, Ia., has arranged for the construction of a garage on West 6th street. It will be ready for occupancy July 1.

The Dawson Machinery Co., of Worcester, Mass., has purchased property at 140 Foster street. A machine shop and salesrooms will be erected.

The Auto Owners' Supply Co. has opened a garage and repair shop in Newington, Conn. Walter L. Foss, of New Britain, in the same State, is manager.

The Packard Motor Car Co. of Chicago is erecting salesrooms and a service station in Milwaukee, Wis. It will cost $50,000 and H. P. Robinson will be manager.

M. J. Carroll has entered the trade in Houghton, Mich. He has secured the Ford agency and has located his salesrooms in the Citizen's National Bank Building.

E. H. and H. A. Hawisher have accepted plans for a garage which they will build in Lima, Ohio. The estimated cost is $12,000. The firm style will be Hawisher Bros.

The Mount Royal Tire Repair Co., of Baltimore, Md., is to build a larger and more modern plant than it now possesses. It has bought a site at 906 West Mount Royal avenue.

The Standard Automobile Co., of Washington, D. C., has opened a new garage at 442 West Chestnut street. The company handles Mitchell, Empire and Hupmobile cars.

Fred T. Hendee, formerly a business man in Beloit, Wis., has formed the Perkins-Hendee Garage Co. in San Bernardino, Cal. His associate is Clement D. Perkins, a nephew.

K. E. and F. L. Fosha and L. R. Larson have organized the Washington Street Garage Co., in Green Bay, Wis., with a capital of $10,000; they have located on Washington street.

V. L. Singley has purchased the Palace Garage, on Hannon avenue, Camden, N. J., and will improve and operate it. Formerly he was connected with the Locomobile Co. of America.

Leach & Christensen have purchased part of the building in Hartford, Wis., formerly occupied by the Hartford Casket Works, and will establish a garage and salesrooms; they are Overland dealers.

The Interstate Motor Car Co., of Waterloo, Iowa, has moved into new quarters at 424 East 6th street. The company, of which Ralph Slippy is proprietor, handles the Interstate and Michigan cars.

The Beloit (Wis.) Auto Supply Co. is about to open a tire store and vulcanizing plant in Beloit, at 420 South State street. H. J. Retz, a Rockford (Ill.) business man, will manage the establishment.

W. B. Stevens and others have formed the Star Garage Co. in Clintonville, Wis. The concern will open a garage, repair-shop and salesrooms on Mill street. Orre Williams will manage the mechanical department.

The B. E. Griffey Co., of Indianapolis, Ind., which formerly confined itself to advertising novelties, has entered the automobile trade as manufacturers' agents. It already has secured several accessory accounts.

Charles Tiffany has secured permission to erect a two-story garage on Market street, in Poughkeepsie, N. Y. Permission was secured despite objections to the effect that the garage would disturb a library and a church nearby.

Myer Abrams & Co., of Boston, Mass., who recently lost their quarters and many cars by fire, have arranged for the opening

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of a truck department on Portland street near the North Station. The company is Lauth-Juergens dealer.

The Little Rock (Ark.) Auto Co. has been sold by Gordon P. and J. A. Van Etten to W. L. Lewis and C. H. Vaughn. The latter has been employed by the company for three years, while Lewis until recently was in business in Memphis, Tenn.

The Cumberland Motor Car Co., of Nashville, Tenn., has completed a garage at 15th avenue and Broadway. The company is dealer in Premier, Abbott-Detroit, Chevrolet and Little gasolene cars, Standard electrics, Federal trucks, Firestone tires and Harris oils.

Oscar Stegeman, president of the Stegeman Motor Car Co., of Milwaukee, Wis., manufacturer of Stegeman trucks, has entered the pleasure car field as a dealer. He has taken the Howard agency and will maintain a salesrooms and service station in the Stegeman works at Linus and Woodward streets.

C. W. Bull and T. A. Young have opened an agency in Syracuse, N. Y., at 500 East Genesee street. They represent the Franklin Automobile Co., which is located in the same city. Bull for the past year has been in charge of city sales for the Franklin company, while Young for several years has handled Peerless and R. C. H. cars in Syracuse.

The Detroit Automobile Exchange has been formed in that Michigan city for the purpose of dealing in used cars. It is located at 294 Jefferson avenue and has storing room for 200 cars. Its officers are: Grover C. Farnsworth, general manager; Everett W. Pingree, secretary and treasurer, and Robert M. Drysdale. Pingree is also a shoe manufacturer.

The Southwest Motor Co. has been formed in Phoenix, Ariz., to take over the Buick and Apperson agency in Arizona. The company was formed by Messrs. Roper and Bird, who recently went from the East to Arizona to enter the Arizona Land and Improvement Co. John Smith, who was connected with the Ferguson-Mohn Co., the former owner of the agency, is sales manager.

The Central Motor Car Co., of Reading, Pa., has had plans prepared for a three-story brick, fireproof building, 110 x 61 feet, to be erected at 5th and Cherry streets; the company is Ford dealer and has subagencies in Hamburg, Kutztown, Wernersville, Boyertown, Morgantown and Birdsboro. The first floor will be offices and stock and showrooms; the second will be for storage, accommodating 84 cars, and the third will be a repairshop with a capacity of 18 cars. The equipment includes a heavy freight elevator.

JERSEY TRADESMEN RAISE DUES AND HEAR SPEECHES

Also Take Over Newark Show and Honor Retiring President—Ellis Chosen to Head Organization for Next 12 Months.

At its annual meeting in Newark, on Saturday last, 22nd inst., the New Jersey Automobile Trade Association elected officers as follows: President, W. H. Ellis; vice-president, George H. Smith; treasurer, R. A. Green; secretary, R. B. Mann; trustees, G. B. Thayer, C. Louis Fitzgerald, I. M. Upperen, George Paddock and G. E. Blakesley.

At the same meeting it was voted to increase the initiation fee for active members from $25 to $100 and to associate from $25 to $50, and to raise the dues of the actives from $10 to $15 and for the associates from $5 to $7.50 per year. The Trade Association also formally took over the management of the Newark automobile show, which heretofore has been conducted by the New Jersay Automobile Exhibition Co., which is composed largely of the same men.

At the banquet which followed, George E. Blakeslee, the retiring president of the association, was presented with a handsome silver service in token of his there years' service as the head of the organization.

Among the guests were Job H. Lippincott, State Commissioner of motor vehicles, who, when called on, declared that "there was no longer an 'automobile question'" and professed his desire "to solve the problem of regulating motor cars and to give the owners a square deal." H. A. Bonnell, who, among other things, is general manager of the Automobile Board of Trade, declared that the three problems facing automobile dealers are "the sale of second-hand cars, legislation and the construction of good roads."

Benjamin Sells His Syracuse Business.

Although it was stated that C. Arthur Benjamin, who last week became the sales manager for the American Locomotive Co.'s automobile department, would retain his retail business in Syracuse, N. Y., an unexpected offer came his way and, as a result, it was disposed of on Monday last to W. D. Andrews, a bicycle and sporting goods dealer in that city. The sale includes Benjamin's salesroom and main garage on West Onondaga street and his service building on South Clinton street, as well as their entire contents.

It is Andrews's intention to continue both establishments and for the purpose he is organizing a $100,000 company of which he will become president; Ross L. Andrews will be treasurer and general manager, and E. T. Fuller, Benjamin's former superintendent, will be vice-president. Seventeen years ago Benjamin and Andrews were partners in the bicycle business in Syracuse, Benjamin withdrawing to engage in the automobile industry. Latterly he handled the Packard and Hudson cars.

Recent Losses by Fire.

Chicago, Ill.—David Hogg, 46 Oak street, garage destroyed. Loss, $25,000.

Minneapolis, Minn.—McMillan Garage, 239 Clifton avenue, damaged. Loss, $400.

Buffalo, N. Y.—Clarence Gifford, 77 Edward street, garage damaged. Loss, $5,000.

Attleboro, Mass.—Arthur E. Rounds, West street, garage destroyed. Loss, $3,000.

St. Paul, Minn.—Northwestern Fuel Co., garage, three trucks and one car destroyed. Loss, $15,000.

Pasadena, Cal.—F. H. Latimore, 460 North Madison avenue, garage damaged. Loss not given.

Providence, R. I.—Pugh Bros., 53 Mathewson street, garage damaged by explosion of vulcanizing tank. Loss not stated.

Quick Action in Stoddard Bankruptcy.

It develops that the Stoddard Motor Co., of New York, against which on Wednesday last, 19th inst., a petition in bankruptcy was filed by order of the board of directors, was adjudicated a bankrupt the same day, Stanley W. Dexter being appointed referee in bankruptcy. He has called the first meeting of creditors to occur April 4th, at which time a trustee will be chosen. As the Maxwell Motor Co., successor of the United States Motor Co., is practically the only creditor of the Stoddard company, which is merely a New York branch, the winding up proceedings will undoubtedly be as expeditious as was the adjudication in bankruptcy.

Priest is Garageman's Big Creditor.

Dennis J. Carney, operator of a garage in Worcester, Mass., has filed a petition in bankruptcy, stating that his liabilities amount to $10,353 and his assets to $2,898. Of his liabilities, $1,160 is secured and $9,193 is due to about 25 unsecured creditors, the principal of whom is Rev. John J. O'Keefe, of Dalton, Mass., to whom Carney owes $6,981 for borrowed money, rent and promissory notes.

Daughters-King to Produce Tops.

The Daughters-King Auto Specialty Co. has been formed in St. Louis, Mo., to manufacture tops, seat covers and similar goods. It is located at 3323 Locust street. W. K. Daughters is president of the company.

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NEW YORK, MARCH 27, 1913

GOVERNOR SULZER, THE TOO CONSIDERATE.

Governor Sulzer, of New York, is too considerate. Before he permits the introduction of his special bill seeking to double the tax on automobiles, he should seriously commune with himself. He owes it to the common "peepul" whose particular champion he long has professed to be. For what does double taxation mean to the men or women who own automobiles? It is a trifle lighter than air.

Politicians, like death, love shining marks, and having found that the State is in the chronic condition of needing more money, and the secretary of State, who is also new to his job, having informed him that automobilists can afford it, why should they be permitted to escape with a mere doubling of the fees now imposed upon them? The suggestion is ridiculous! They always have been "marks"—"easy marks"—shining marks. Their tax, therefore, should at least be quadrupled.

Even if in investing $200 or $300 in the purchase of a second-hand motor car or motor wagon any man believes he is thereby increasing his pleasure or facilitating his business by dispensing with a horse, he has no right to such beliefs. The possession of any vehicle not drawn by animals is absolute proof of unlimited wealth. It is proof that the owner is fit not merely for double taxation, but for triple or quadruple taxation. It is convincing evidence that he can afford it. He has no rightful claim to sympathy. He has no right to own an automobile anyway. He deserves to be "shaken down."

We repeat, the governor is too considerate. He should find some legal means of taking the coat from the automobilist's back or the shoes from his feet—some means of making him pay for the air he breathes, or at any rate for so much of it as is drawn into his carburetter. That sort of thing will be fair and just and proper, and in the interests of the common "peepul" who cannot afford automobiles and who have no carburetters to consume more air than is their portion. The governor should go the limit while he is about it.

The Sulzer idea and the Mitchell May ideas are simply great! Let the good work go on, "and damned be he who first cries Hold! Enough!" If it goes far enough, the automobile interests may discover that they have about 500,000 votes in the State of New York alone and that, properly marshalled, that number of ballots will give as much pause to Sulzers and Mays and other politicians as does the Grange vote; and that consummation will be worth even triple taxation.

ELECTRIC STARTERS FOR USED CARS.

Although it is one of the advantages of the average electric lighting dynamo that it can be applied to almost any car by almost any person possessing even a modicum of mechanical ability—the common variety of repairman can be assumed to possess a little more than that modicum—the same can be said of very few electric starters. So far, only one manufacturer has developed an electric starter that is easily applicable to any existing car without the necessity for extensive alterations, and has advocated its application by any one other than himself, and though the lothness of others to follow suit may be excused, in a measure, by their fear of permitting installations that may fall short of the efficiency and dependability demanded and obtained of factory-made installations, it would seem that they may be overlooking a by no means small field.

The used car problem has not been solved as yet. And until all manufacturers re-build cars taken in exchange, bringing them up to date by the addition of such modern equipment as the electric lighting and starting system represents—which may or may not represent the happy solution of the problem and which probably never will come to pass—there will remain on the market large numbers of old cars that are minus these features. In many cases their owners want electric lights and engine starters and are willing to pay a reasonable price for them, but they are liable to balk at any proposition involving extensive and expensive alterations and the consequent loss of the use of the car for a time long enough to make the installation.

Now that the electric lighting and engine starting system has become standard equipment on so many cars, much of the mystery that shrouded it when first it appeared has been dissipated and its installation outside of factories rendered possible.

One other point: The development of such easily attached systems very likely would open up a way for the dealer in used cars to bring his wares more up to date and to dispose of them more easily, thus, in turn, opening up the way to greater trade in new cars by providing an easier gateway for those taken in exchange.

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OBNOXIOUS BILL REAPPEARS SHORN OF SEVERAL CLAUSES

New York Secretary of State "Patches Up" McClelland Act and Has It Reintroduced — Sulzer, Too, Has a Pet Measure.

Although it is generally believed that the only automobile legislation likely to be enacted by the present legislature of New York is Senator White's bill providing for the appointment of a commission to confer with the authorities of other States, with a view of drafting a uniform law, Secretary of State May, like all other new officials, has so much automobile on the brain that he is not content to abide that result.

May was the real author of the obnoxious McClelland bill, and after it was punched full of holes at the public hearing two weeks ago he again took it in hand and, after patching it here and there, he had it reintroduced on Monday last. Among other things, the double taxation feature has been eliminated, and as for the other things that are dear to the May heart, he points out that they already are parts of the laws of some or all the several States with which Senator White's proposed conference committee would confer.

Because it has been stricken out of the modified McClelland bill, however, does not mean that the effort to squeeze the automobile interests by imposing a double tax has ceased. On the contrary, Governor Sulzer is having a separate and distinct bill drafted to accomplish that specific purpose so dear to the Sulzer heart.

Morgan to Reach Catskill or Bust.

"Pike's Peak or Bust" was a comparatively trifling undertaking compared with the "Catskill or Bust" scenic tour. Although Catskill is only about 125 miles from New York City, where he is located, W. J. Morgan for some six years has been unsuccessfully trying to reach that Hudson River town and to bring guests to the hotels which abound in summer vacation regions adjacent thereto.

Not willing to admit defeat, and with the idea of having it recorded as his "farewell appearance" as a promoter, Morgan has revived the oft-revived "scenic tour" and will endeavor to reach Catskill on May 15th next, after starting from New York the day before. He states that he has applied for A. A. A. sanction and that the route now is being mapped. Also that "in addition to being a pleasure jaunt the tour will be an endurance, reliability, hill climb and fuel economy test."

If Morgan really does reach Catskill this year, and despite his announcement that the scenic tour is his "farewell contest," it is given out that thereafter he will promote contests for the Motor Car Dealers' Contest Association of New York, making it appear that his is a Patti "farewell."

As the dealers' representative, he has in prospect a four-day inter-city reliability contest that will reach from New York to Philadelphia and then to Boston.

Northwest Seeks the National Tour.

Unless some hitch develops in the tentative program that has been mapped out, Detroit, the Automobile capital, will not witness the start of the A. A. A. National Reliability Tour, which was abandoned last year because of insufficient entries, nor will New Orleans witness the finish of the renamed Glidden. A new route, of approximately the same length as the "Lakes-to-the-Gulf Route," which was mapped out for last year's tour, has been tentatively chosen. It stretches from Minneapolis, Minn., to Kalispell, Mont., in the very heart of the new Glacier National Park; the preliminaries have been undertaken by the Automobile Club of Minneapolis and the Civic and Commerce Association of that city, which bodies are working in conjunction to secure the start of the tour for the Flour City.

Receiver Takes Brighton Beach Track.

If "Bill" Pickens, or anyone else, conducts races at the Brighton Beach track in Brooklyn, N. Y., this summer, they first must reckon with a receiver. For Samuel Gompertz has been appointed receiver of the Brighton Beach Racing Association as a result of foreclosure proceedings on a $50,000 mortgage. The action, which it is stated is a purely friendly one, was taken for the purpose of having someone handle the property in an effort to make it a paying proposition, which means that it will be "hired out" whenever possible exactly as heretofore, which has not been often since "playing the ponies" ceased to be profitable or legal in New York State.

New Jersey May Punish Non-Residents.

New Jersey still is having a hard time convincing itself that reciprocity is wholly right and proper. The effort to rescind non-resident privileges having failed, the legislature has passed and the governor has signed a bill authorizing the motor vehicle commissioner to suspend the 15-day touring privileges when cause is presented. When guilt is proven, it is punishable by a fine not exceeding $200. The governor also has signed a bill providing a fine of $500, or imprisonment for 60 days, for the manufacture of any imitation of the official registration plate.



*Indicates Sanction by A. A. A.

March 24-29, Indianapolis, Ind.—Indianapolis Automobile Trade Association's show.

March 24-29, Watertown, N. Y.—Annual show of the Watertown Automobile Dealers' Association in the State Armory.

March 29-April 5, St. John, N. B.—New Brunswick Automobile Trade Association's show in Queen's Rink.

April 1-6, San Francisco, Cal.—San Francisco Automobile Dealers' Association's motor truck show.

April 5-12, Pittsburgh, Pa.—Pittsburgh Automobile Dealers' Association's seventh annual show in the East Liberty Market building.

April 14-16, Chicago, Ill.—Chicago Motor Club's reliability tour for commercial vehicles.

April 16-17, Taylor, Tex.—Track races under the auspices of the Taylor Automobile Club.

May 5, Washington, D. C.—Start of the reliability-economy run for commercial vehicles under the auspices of the Washington Post.*

July 1, Indianapolis, Ind.—Start of the Indiana Automobile Manufacturers' Association's cross continental tour to Los Angeles, Cal.

May 5-8, Washington, D. C.—Motor truck reliability contest under the auspices of the Washington Post.

May 30, Indianapolis, Ind.—Third annual 500-mile sweepstakes races on the motor speedway.*

May 30, Chicago, Ill.—Annual Interclub reliability run of the Chicago Motor Club and the Chicago Athletic Club.

June 21, Algonquin, Ill.—Algonquin hill climb under the auspices of the Chicago Motor Club.

June 25-28, Chicago, Ill.—Reliability tour of the Chicago Automobile Club.*

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J. W. HERRMANN, Notary Public.

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ADVOCATES ELECTRIC CARS FOR "ALL YEAR" BUSINESS

High Cost of Gasolene Will Increase Demand, Says Brand—Advantages to Dealer Who Handles Them.

In these days when the price of fuel is a burning question with the gasolene car dealer, it enables the electric car dealer to score one on every other kind of a dealer, for, as every one knows, since the "steamer" lost its popularity, the electric has been the only vehicle that is independent of gasolene. That this very fact should operate to stimulate the demand for electrics and that their successful exploitation in cities where they are not so well known, as well as a substantial increase in the business they represent in cities where they already are well established, requires only a dealer's initiative is the opinion, expressed or unexpressed, of no inconsiderable number of persons whose positions in the trade enable them to feel the pulse rate of the motoring public and from this to draw conclusive arguments.

Frederick A. Brand, who is secretary and treasurer of the Broc Electric Vehicle Co. of Cleveland, Ohio, is one of these persons, and in view of his intimate knowledge of the electric vehicle industry and all that pertains to it his opinions and advice cannot well fail to carry weight. Brand's creed, expressed in so many words, is to assist the dealer along the broad highway of success by pointing out to him new methods of increasing his yearly business, and as one simple means of accomplishing this end he suggests that gasolene car dealers consider carefully the desirability of taking up electric cars as well, if not as a means of creating an "all-year" business, which with gasolene cars alone is wont to show signs of lagging in the early fall and spring, then to increase that business and make it show a better credit balance.

Brand also points out that the electric car trade is the easier for the dealer to care for; that the electric is the simplest for the garageman to care for; that the ratio of overhead expense to profit is lower in the case of the electric car than in the case of the gasolene car; and that the electric car dealer has considerably less need of carrying an expensive stock of spare parts than has the gasolene car dealer.

"With gasolene costing the city driver of a four- or five-passenger car from two to two and one-half cents per mile, as against an electric current cost of from one to two cents a mile, largely dependent upon current rate and whether the driving is over level or hilly roads, electric cars are bound to increase in popularity," declares Brand in dealing with that phase of the subject. And by way of laying emphasis on the assertion, he cites the case of one disgruntled city driver of a five-passenger high-priced gasolene car who, because he was unable to get better than eight miles to the gallon of fuel, for which he paid more than 20 cents, seriously is considering the purchase of an electric; his consideration is based solely upon the high cost of fuel.

"Now understand me," Brand adds, in summing up, "electric cars with their privacy, their simplicity of operation, their freedom from repairs—the latter attributable to some extent to the slow speed at which they are operated—as well as their low maintenance and power cost, do not need a high price of gasolene for a sales increase, but this high fuel cost of gasolene cars is another factor that is going to further increase the demand for electrics, and live dealers must take on electric lines before their competitors get too firmly established with electric lines they now handle."

One other thing that Brand has failed to make specific mention of, though probably only because it is well known, even if it is not often thought of, is that the electric car is the only original self-starting, electrically lighted car, and that for silence it has everything else "backed off the boards," to employ a colloquialism.

Allen Cars Coming from Fostoria.

The Allen Motor Car Co. has been organized in Fostoria, Ohio, where it just has secured a plant in which will be manufactured the Allen "36," a well standardized car listing at $1,350, fully equipped, of which a number already have been produced. The company will be incorporated some time prior to July 1st with a capital of $500,000. Meanwhile the purchase of material is being done through the Peabody Buggy Co., an old-established Fostoria concern, which is interested in the Allen enterprise. The sales department is in charge of J. E. Wright, who is a member of the Columbia Buggy Co., also of Fostoria. The Allen company is already sold up for the present season and figures that having made the necessary connections it will be enabled to increase its output for 1914 to 1,000 cars.

Traveler Acquires Factory in Detroit.

The Traveler Motor Car Co., which recently was organized in Detroit by J. P. Lavigne and which purposes selling its product direct to the public, has purchased property in that city on Grand River avenue. It comprises a two-story brick building, 80 x 100 feet, which immediately will be remodeled.

R. A. C. DECIDES TO TEST ELECTRIC LIGHTING SYSTEMS

Will Award $250 Cup to Entrant Whose Equipment Makes the Best Showing—Conditions of the Competition.

By way of determining which of the many electric lighting systems on the market is the best, or at least which is the best under the conditions imposed by itself, the Royal Automobile Club has decided to hold an open competition, for which entries will close September 15th.

For the electric lighting set that is adjudged to be the best the entrant will be presented with a cup valued at $250 and the official R. A. C. certificate of performance. The conditions are as follows: "The whole equipment must be entered for the trial and must be properly installed upon a car; the distance run upon the road shall not be less than 2,000 miles; all lamps (not less than two head lamps, two side lamps, and one tail lamp) shall be alight at the same time and for at least six hours each day; the Technical Committee of the R. A. C. shall decide which of the performances is the best; any equipment which completes its trial before October 15th shall be eligible." Which means, briefly, that equipment may be entered any time for test prior to Septemer 15th, and at the completion of the test the entrant will be awarded a certificate.

The certificates of all those whose equipment has been tested prior to October 15th will be examined and the award of the cup made after comparison of the certificates by the Technical Committee of the automobile club.

Six Months Detecting a Detective.

Having spent the time from September 30, 1912, to the current week getting service on Clovis E. Duhain, who is connected with the Pinkerton Detective Agency in New York City, the International Motor Co. filed suit against him in the Supreme Court for New York county, alleging an indebtedness of $723.60; the difficult service is said to have been caused by the fact that Duhain travels almost continuously and could not be located in New York, not even by the sheriff of Kings county. Duhain was interested in a company which operated "rubberneck" wagons and backed the purchase of two trucks from the Mack Bros. Motor Car Co. in 1909. Of the total indebtedness, $614.08 is on a three months' note drawn May 15, 1911, and $109.52 is claimed as unpaid interest on other notes drawn at various dates.

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WIDER MERCHANDISING In the MOTOR

CLEAN FLOORS AS AN ASSET

Saving Effected in Workmen's Time, and Tone of Garage Raised by Weekly Use of Hose—One Man's Experience.

It is just as good business management and just as important to have a clean floor in the garage part of your establishment as it is to have a neat, clean office and salesroom.

It is a fact that workmen are affected visibly by their surroundings and scientific study has disclosed that one way to increase efficiency is to maintain an atmosphere of cleanliness and order. In large establishments it has been found possible to increase the efficiency of operatives from 15 to 20 per cent. by removing machine borings, sweeping the floors frequently and otherwise keeping everything in apple-pie order.

Standard of Work Raised.

Not the least interesting fact is the effect such cleanliness has in raising the standard of work as well as increasing the quantity. Men in small establishments are just as responsive to such methods.

This recently was illustrated in the case of a garage, the owner of which for years had been satisfied to have a repair department situated at the rear end of the building and in which there was literally a three-inch accumulation of grease and dirt on the cement floor. When the owner decided to use a shovel and hoe on it and see what could be done, all hands were put on the job for about half a day. First the floor was thoroughly scraped, then it was washed with and scrubbed with gasolene till every bit of grease was loosened; this was followed by soap and water scrub and finally a grand "hose down" which made it fairly presentable. A rule of a thorough wash once a week was adopted and has since been carried out.

Before the era of cleanliness the grease was so thick on the floor that it actually soaked through a man's shoes. Cars left for repairs showed the result in greasy running boards, floor coverings, tires, etc. The workmen's garments showed similar effects, and there was no effort made to keep anything clean because of the utter hopelessness of it. Tools laid on the floor became grease covered and left their marks wherever deposited during the course of a job. The clean floor resulted in greater freedom in working, better work, more cleanly dressed workmen, increased self-respect on the part of all hands, greater snappiness in tackling jobs and better satisfied customers. It does not cost much to try this plan, and it is not only worth trying but worth keeping up—and don't overlook the fact that customers notice and appreciate cleanliness and order.

One Man Inspired the Whole Force.

Without realizing what was responsible for it, the entire department had taken on more activity and more ginger. Customers who had been getting half-baked work, now commented on the change and told their friends how quick and how satisfactory the work now was. This had given the impetus that resulted in an immediate gain—one boy-mechanic with a genuine love for his job had unconsciously influenced a force of six men to the extent of turning a loss into a profit.

EXAMPLE AS AN INSPIRATION.

The business of the repair department of a Western dealer grew so rapidly that the proprietor determined to look into the reason back of it. He had been selling the same line for two years and the cars were standing up splendidly. The repair department had always lost money before, and now it was making a great showing, doing more work and at a liberal profit. They had the same equipment. What was the secret? Examination of the various charge tickets showed that many outside cars had been cared for in addition to his particular line; so he felt relieved to know that at least the increased business was not due to any trouble with his particular "line."

After several attempts to fathom the mystery from the office-end, the dealer kept his eye on the department and found that the change was all due to the fact that two months before the foreman had hired a young, black-haired mechanic who looked like a boy. This boy mechanic loved his work so heartily that he never let a job go out till it was completely satisfactory. If the motor was noisy, he seemed instinctively to know just where the trouble was; like some doctors he could diagnose a case with startling speed and accuracy—and he never wasted any time. He would get right at things. His example had fired the whole force.

GETTING VISITORS' NAMES.

Sometimes people come in and look at a car and then walk out after an apparently pleased examination of your car. You do not know where they came from or where they are going; in many cases that is the last you see of them. One dealer makes a point of mailing catalogs. He never has them in sight in the salesroom, but keeps them in a dust-proof file. On such occasions as the one referred to he says: "Can't I mail you one of the new catalogs when they come in?" From that point it is comparatively easy to get the name and address. The idea is to get the information without putting the question point blank.

WHAT "MAKING HAY" REALLY MEANS.

"Make hay while the sun shines" is another way of saying "Don't wait too long, or you will find that the other fellow has been there and signed up the ripe prospect you thought was yours exclusively."

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AWAKENING WORLD

SALESROOM "SNOBBISHNESS"

Incident Which Serves to Illustrate that Appearance Often is Deceptive and that Dress Belies Real Prospects.

The incident happened in a piano store. The concern had the agency for the Steinway; it also had other pianos at popular prices. The salesmen were all keyed up to the Steinway class, as far as style goes. They rather looked down on anyone who talked or thought anything but Steinway. Most of them were young, and not so very clever, as the story will show.

They would almost rush in a body to greet a pretty or a well-dressed woman who might pay $10 down and $5 a month on an instrument, but when one came who was poorly garbed there was much hesitation and indifference. Usually she had to stand for a few minutes before one of these pretty youths would elect himself to wait on her.

The "Boss" Sets an Example.

The "boss" knew his men were young, and one day he discovered they were snobbish. He determined to teach them a lesson. His opportunity came almost immediately. He heard the door open, and a neatly dressed Italian woman entered. The salesmen were making no move to greet her. The "boss" stepped to the door in lively fashion. He greeted her with a smile and a "Good Morning." She explained that her daughter was going to take piano lessons. Her husband was in the fruit business. They had determined to buy a piano. Would he show her one for about $250? Would he?

The "boss" spared no effort to show her that he was selling the best pianos in town for that money or anywhere near it. She decided to buy one of them. Could he deliver it that afternoon? Why, certainly! How much would she like to pay down? She would pay cash. Pay all of it? Yes. So she reached down into the folds of her dress and brought out a roll of bills which the "boss" spent some time in counting.

Lesson in Politeness and Promptness.

The receipt was given and the order entered, and then the "boss" called his selling force into the office and, with the roll of bills still in his hand, taught them a little lesson on politeness, promptness, salesmanship and playing the law of averages that put an entirely different complexion on that sales force.

Occasionally *in* the automobile business similar lessons must be taught. Occasionally men kowtow to style and dress and show rudeness approaching almost to insult to the "rural" looking fellows who once in a while stroll in. But it does not happen so often as it used to, and it is likely to happen still less in the future.

MENTAL ATTITUDE REFLECTED IN PROFITS AND LOSSES.

"People who own cars don't care about saving money," said an accessory dealer to a manufacturer's representative a few days ago. "I don't push these devices; we have them in stock and are ready to supply anybody who asks for them."

"How many did you sell last year?" said the salesman.

"About a hundred sets," was the reply.

Sales Consummated Without Effort.

"You sold a hundred sets and never even showed them to anyone unless they asked for them! Well, if that's the kind of a dealer you are, I certainly do not want to tie up my line with you," said the salesman.

"Just think of it!" said the salesman, recounting the incident, "that concern, without any effort, has sold over $600 worth of my goods during the year, making a profit of 40 per cent.. Supposing they had started out to sell 500 sets, placed a mark and made a real effort to sell the goods, what a nice profit they would have had off the one little line? And think of that statement that 'People who own cars don't' care about saving money'! Wouldn't that jar you? It certainly beats all how many people are asleep to their opportunities."

KNOWLEDGE THAT PREVENTS OVER AND UNDER-STOCKS.

Just as many individuals make a mess of their lives simply because they do not **know** themselves and never make any really earnest attempt to find themselves out, so to speak, so many business failures can be traced to a lack of definite, accurate knowledge.

Ascertaining Territory Conditions.

It is not simply a question of knowing the goods; it is a question of getting down to rock-bottom knowledge on all the conditions that surround the sale and the stocking of them. The dealer who **knows** just what his territory can yield, taking into consideration the full strength of his competition, the conditions of business generally and the other forces that must be reckoned with, is also likely to **know** pretty well what the factory will be able to do in the way of deliveres.

Gauging Needs by Past Records.

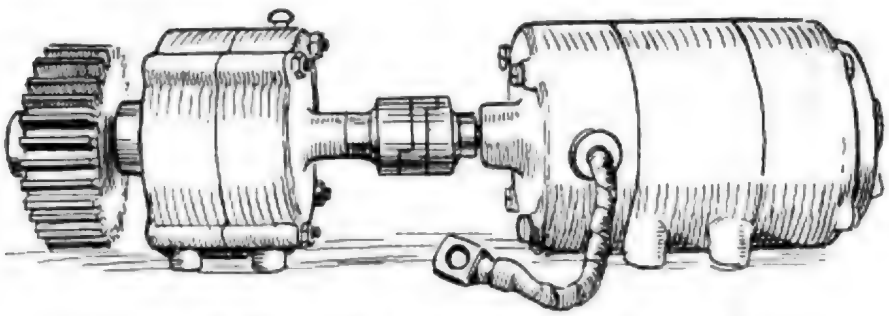
Such a dealer will not have an understock of cars contracted for, nor will he have an over-stock. He will gauge his needs by his past records, supplemented by careful study of present local conditions. The dealer who **knows** will never be in the embarrassing and financially painful situation of one who sold a thousand cars and had to refund deposits on all but two hundred and fifty. Before the dealer who **knows** commits himself that far, he will have an iron-clad guarantee of deliveries from the factory.

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SPLITDORF STARTER EMPLOYS UNUSUAL REDUCTION GEARING

Planetary Principle in Modified Form Permits Meshing of Several Teeth at Once — Motor Supplied in Two Sizes.

Supplementing earlier and less complete details of the Splitdorf electric engine starter, which, prior to and at the time of the organization of the John Splitdorf Corporation of 136 West 52d street, New York City, which produces it, was heralded as a device quite different from the ordinary run of such devices, additional information, forthcoming with the practical readiness of the system of the market, reveals that its most distinctive feature lies in the employment of an unusual type of reduction gear. Though it already was fairly common knowledge that such would be the case, and free speculation had coupled the terms "planetary and epicyclic" gear with nearly all discussions of it, it now transpires that the gear, while of the planetary type in appearance, actually differs from such construction in several respects.

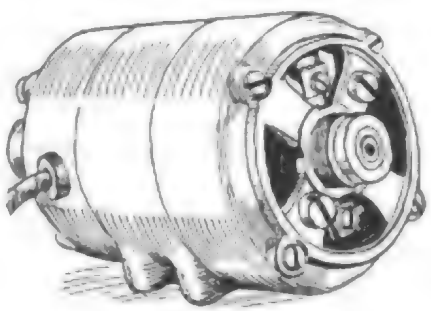


SPLITDORF STARTER COUPLED TO REDUCTION GEAR

The mechanism approaches planetary construction in its functioning in that the gears always are in mesh and that those upon which the greatest strain is imposed have several teeth in engagement at all times, the latter feature being one upon which particular stress is laid as indicating an unusually high factor of safety coupled with smallness and lightness and the reduction of internal friction to the minimum by reason of the distribution of the driving load over several teeth instead of its concentration on one tooth.

In both internal and external appearance, the reduction gear resembled the more or less familiar sun and planet train, though the resemblance is carried no further. Instead of rotating about the sun wheel, the planet pinions are anchored fast to the case and the motion of the gear shaft is transmitted through the pinion gears to the first internal, which is supplied with a hub on which a second spur gear is cut; this hub, in turn, operates through its pinion train a second internal, the hub from the last internal carrying the sprocket or gear for the final reduction. Obviously, it is a comparatively simple matter to increase or reduce the size of the final driving sprocket or gear, and in this way to obtain any total reduction that may be required in cranking the particular engine to which the system is applied.

The electric motor that forms the power element of the system is of the orthodox series pattern, except that it is very small and very light. Series winding is used, it is well to explain, by reason of the fact that this method results in an increase in motor torque with the increase in the load up to the stalling point. The reason for the really tiny size of the motor is apparent in the incorporation of a miniature flywheel within the casing. This flywheel, it is pointed out, accumulates sufficient energy of its own at 4,000 revolutions a minute, which is normal speed, to crank a heavy motor with the compression cocks closed even after the current from the battery has been cut off. Consequently it may be assumed to have a materially beneficial effect in assisting the motor to maintain its high rotative speed at the moments when the pistons of the engine are passing compression dead centers.



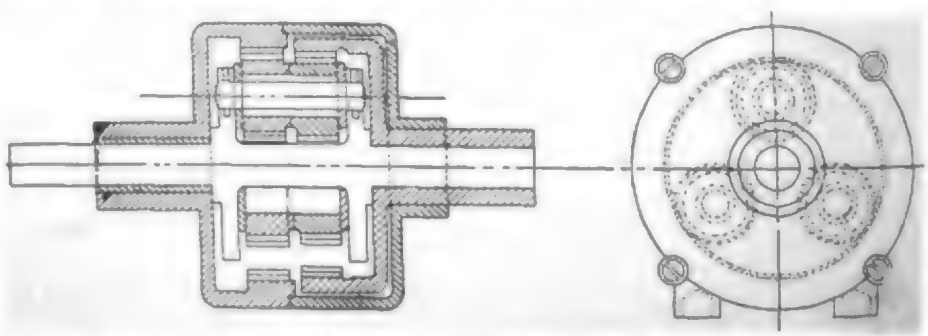
MOTOR IN DETAIL.

Two sizes of motors are produced, one of which is slightly larger than the standard size developed for pleasure car work and has been designed for the more rigorous work of starting heavier commercial vehicle motors, and both are of the two-pole type with laminated fields to increase efficiency. Though they are constructed for a nominal voltage of six, ample provision for overload has been made, the net result being that they can be operated without likelihood of damage on as much as 12 volts. Motor cases are constructed to be water- and dirt-proof, the end cap screwing into place.

To supplement the starting apparatus, a generator to charge batteries automatically now is in course of preparation and shortly will be placed on the market. In appearance it will be almost exactly like the starting motors and it will be no larger than the smaller of the two. Fields will be of the combined permanent magnet and electromagnet type, this construction having been chosen by reason of its quick "building up" possibilities. Like the motors, the generator will be dust-proof.

Unusual Type of Lamp Reflectors.

As a means of assisting the driver to see around a corner, so to speak, one ingenious motorist has adopted the plan of fastening small horizontal strips of bright tin in front of his head lamps. They are connected at the top with a very light rod and a cord and a couple of small pulleys permits them to be turned; they stand in the same plane with the rays of light from the lamp. When it is desired to illuminate a corner, the metal strips are turned slightly sideways, thus reflecting the light to one side or the other, as the case may be. When they stand straight out they do not interfere in the slightest with the brilliancy of the lamps.



MODIFIED PLANETARY GEARING IN SECTION, SHOWING PINIONS

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BIG "I" OF "TITLED" MEN DISPLEASES REILLY

Says Twelve "I's" in Fifteen-Line Letter Is Somewhat Disproportionate—Men Who Grow in Own Estimation When Managerial Handle Is Appended—"I's" That Failed to Land an Order.

"Humph! Sounds just like Tom Lawson!" snorted Reilly, as he finished the perusal of a letter which bore the mark of an accessory house and was signed, "C. Charles Camerton, Director of Sales."

"One, two, three," and on he counted, ignoring temporarily the query of his salesman, who had asked what connection there might be between the diction of C. Charles and the Boston broker who has won fame and fortune while handing out advice to the trusting public.

"Twelve 'I's' in that letter of only fifteen lines!" went on Reilly, as he waved the epistle in question toward the salesman; if it wasn't for the letterhead you'd never know the letter was from an accessory manufacturer. Sounds as if Camerton was the whole show."

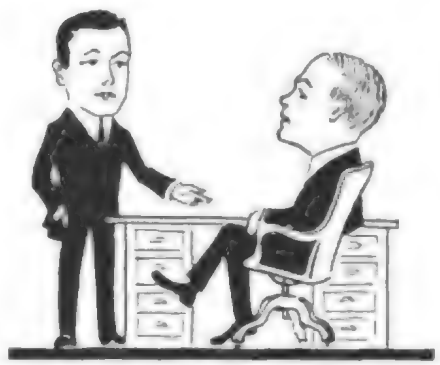
Man and Demeanor not Proportionate.

"Maybe he is some guy," volunteered the salesman, as he took the letter which Reilly offered and read the words which were interspersed between a copious line-up of "I's."

"Some guy nothing!" retorted the dealer. "I'll bet my Easter suit against your last year's breeches that he isn't making any more than you are and from what I know of him he doesn't amount to much more, either. The son-of-a-gun has been trying to sell me stuff for almost a year, and I have been getting more and more prejudiced against him. Every time I get a letter it makes me think of one of Tom Lawson's personal letters to the public, full of 'I this' and 'I that'; I never liked Lawson and I don't like Camerton—and just for his darned 'I' business I'm going to turn him down!"



"TWELVE I'S IN THAT LETTER"



"WHAT'S THE DIFFERENCE?" HE ASKED

"What's Camerton got to do with the quality of his company's goods?" asked the salesman.

"It's got this to do with it," shot back the little dealer, "that every time I buy anything I would have to deal with Camerton, and I never could stand him; and as to 'his company' of which you speak, no one could ever discover the fact that he isn't the whole company himself, at least not from listening to him tell it."

"He is a bit rasping on the nerves," commented the salesman.

"'A bit rasping' is good," supplemented the dealer. "Why, I'll bet the 'I' key on his stenographer's typewriter is worn almost flat. It must cost the company money putting in new 'I' keys for him. Of course, I don't suppose he can help being all puffed up like a pouter pigeon since he has the high-horsepowered title of 'Director of Sales' dragging around after him."

Wherein "Director of Sales" Differs.

"What the difference between a Sales Manager and a Director of Sales?" inquired Reilly's helper.

"Difference!" exclaimed the dealer. "About nine 'I's', I should say; I don't know of any other material distinction."

"Do you know Camerton?" inquired the salesman.

"No, I don't," replied Reilly, "but I know a lot just like him."

"You do!" remarked the salesman in feigned surprise. "I thought perhaps he was the only specimen in captivity."

"Far from it, my boy; far from it! They are a long way from being a rare species," declared Reilly. "You must know several if you ever notice such things. I'll bet you have several personal friends, if you only think over the list, who have swelled up considerably since they discovered they were managers of some description. I am sure that I know a few."

"Perhaps I do," slowly responded the younger man.

"There's one you know!" exclaimed the dealer, as he turned in his chair; "Jim, the Sales Manager at the factory!"

"Jim got a swelled head? No, no!" remonstrated the salesman.

Back History of the Sales Manager.

"Not now, but he used to have," answered Reilly. "I didn't know him then, and it is evidence of the fact that he doesn't feel his oats any more that he tells the story himself. You know, he started in a number of years ago with a manufacturer down in New England as a clerk in the sales department. Jim worked along at a pretty good pace and kept his eyes open, and after a while he got a chance at the sales manager's job and he grabbed it and made good. He buckled down and worked like the devil on the start, he was so anxious to get away with the job, but after he felt that he had things pretty well sewed up and received a raise he got so he rather liked to look at his title, 'Sales Manager,' which he had the right to stick at the bottom of every letter. It sort of worked itself into his system, and Jim took himself too seriously. He began to address his correspondents with 'I's' and sometimes he unconsciously injected a little hauteur into his dictation. He got to be almost as bad as Camerton. He says now that he actually felt that he was a pretty important piece of furniture about the plant. He got an awful fall,



"IT'S BEEN 'WE' EVER SINCE"

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though, one day and it waked him up—and he has remained awake ever since."

"What tripped him?" asked the salesman.

The "Old Man's" Crafty Reprimand.

"The old man himself," laughed Reilly. "The old fox! He is one of the dryest old dogs you ever met. He used to keep a pretty good watch on things, used to read the correspondence and such stuff, but he seldom interfered with a man as long as the man got along all right. One day he walked into Jim's office with a handful of letters relating to an order for $10,000 worth of goods. Jim had been having a little trouble with the order. The old man had read the stuff all through and evidently had got tired of reading so many 'I's', so he picked up the bundle, walked into Jim's office, laid it on Jim's desk and said, 'I gather from these letters that you're having a little difficulty with the McGraw order.' 'Yes, a little,' admitted Jim. 'Well, my boy,' said the old man, 'remember that if you can't turn out that order, the factory and the company are always ready to help you. I'll admit it's a pretty big job for one man all alone.'

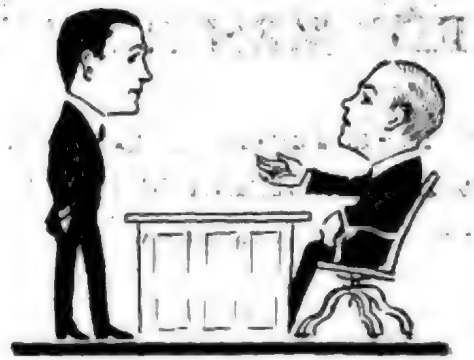
"Jimmy boy sat and thought for several minutes after the old man had gone, trying to make out what the old fellow meant; then Jim picked up the letters and began to look them through. All of a sudden it struck him that maybe 'Jimmy the Sales Manager' was sticking out pretty prominently in the letters. He looked himself over and conducted a little investigation. He asked his most confidential stenographer, who was a girl of considerable common sense, to state frankly just what people thought of him around the office, and she told him honestly that some of them thought he felt rather important since he had been made sales manager. Thereafter, instead of 'I, the Sales Manager' it became 'we, the company,' and it has been 'we' ever since."

Good and Bad in the Use of Titles.

"Titles are a bad thing in some respects," interposed the salesman.

"They are and they aren't," answered Reilly. "I know one manufacturer who cut out titles of every description. He decided that the injection of the personality of his employes into his business was not for the best health of the business, and since he is a man who makes a clean sweep when he makes a sweep, he cleaned the whole business out entirely. He directed that every letter be signed by the name of the company with the initials of the writer underneath.

"On the other hand, there are companies which feature the personality of certain of their employes; several automobile manufacturers derive great advertising value from the featuring of the name of a chief engineer, a designer, a sales manager or some other official. This is all very well, unless the horn-blowing is done at the instigation of the man advertised for the purpose of adding an artificial value to himself; there have been instances of that. I know of one manager who used to tack his name onto his company's ads, and who even tried to persuade some of the papers which frequently used news regarding the company for which he worked to use his name every time a story was used. He was trying to make himself appear invaluable to his employer, and he fell down in a horrible manner."



"WHAT TRIPPED HIM?"

Salesman Diagnoses Another Case.

"I know two or three managers that I'd like to paste in the eye just for luck, every time I see them!" retorted Reilly's lieutenant. "Some of them are in this trade and some of them aren't. There's one guy who runs the store where I have bought shoes for years; he was imported from New York a while ago to manage the store, and he certainly realizes that he's the manager of the establishment. I don't know whether it's because he's manager or believes that a man who has lived in New York is a superior being, but I know this, that if I was paying his salary and knew how he stands with the public I'd give him an injection of turtle serum to tame him down and make him go slow."

"These managers who feel their titles are beneath their titles," asserted the little dealer, "and the men who keep sticking their personality into the boss's business merit just such treatment as the manufacturer I told you about who cut the titles off everybody in the shop. Why, one of the best factory managers I ever knew didn't know what his title was. The advertising department had occasion one day to use his name, and they asked him what his official title was. Another man was known as superintendent of the factory, so he couldn't be that, and he said he didn't know what he was. The advertising manager spent a half hour trying to find the man's title, and in the end they had to make one for him; they called him 'plant manager.'"



JUST THEN THE OFFICE GIRL ENTERED

A Sales Manager and Never Knew it.

Reilly might have rambled on indefinitely had not something, as usual, occurred to stop him. This time it was the office girl, who entered with a handful of mail which she laid on Reilly's desk. The first thing he picked up was a blank sent out by a trade directory company asking for information concerning him and his business; he had filled it out down to the point where he had to enter the names of his sales force, and here he filled in the salesman's name and remarked, "I guess your my sales manager, aren't you?"

"Sir! Me sales manager! How long since?" was the exclamation.

"Oh, a long time," answered Reilly.

"What!" ejaculated the man who had just discovered his eminence; "here I've been a sales manager for months and never even knew it. There ain't nobuddy got nothin' on me, have they?" and he thrust his thumbs into the armholes and tried out the buttons on his vest.

Cash and Note Constitute a Sale.

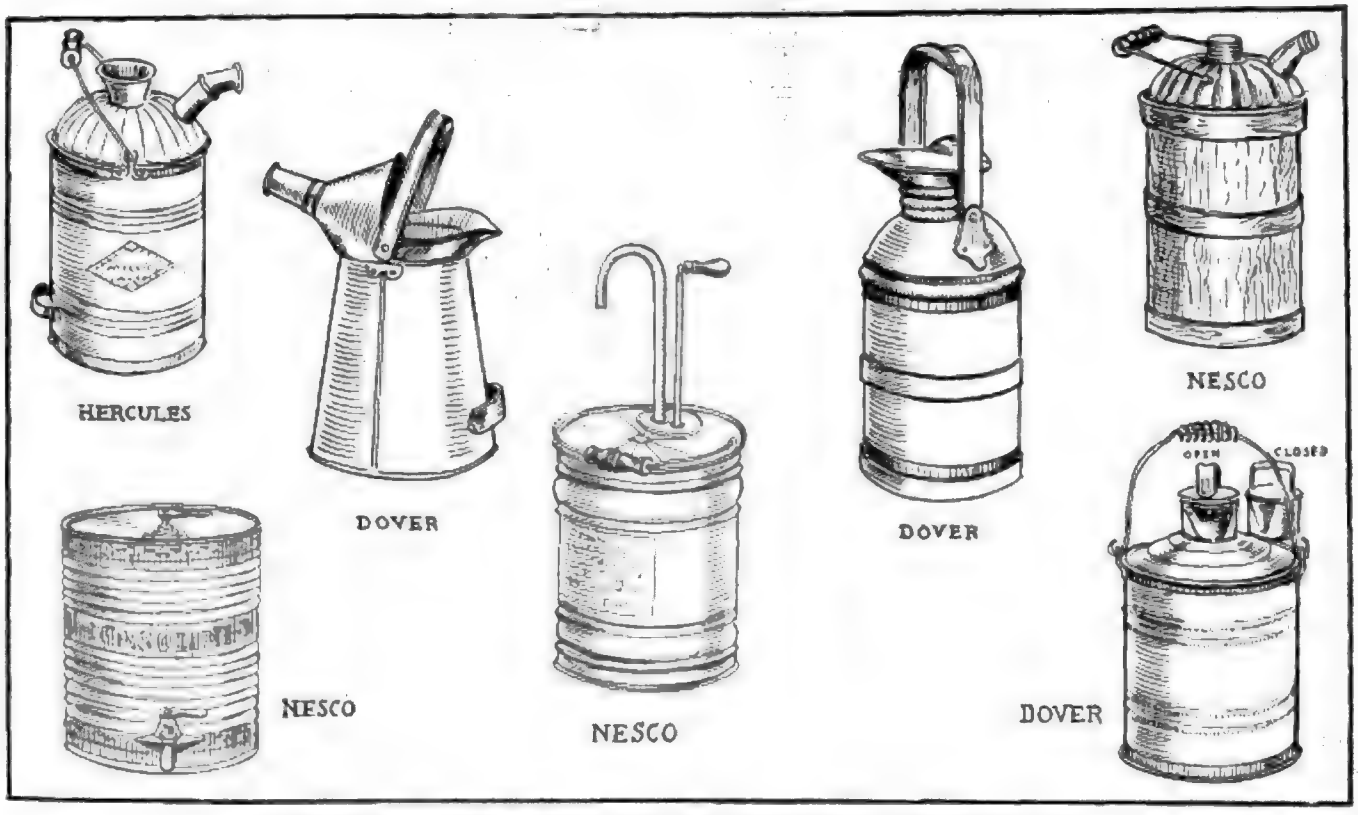
Purchase of a car by cash and a note constitutes an actual sale and not a conditional bargain, according to a jury in the Circuit Court in Washington, D. C., which last week awarded to Harry E. Chandlee a verdict of $1,125.20 against the Springfield Fire & Marine Insurance Co., which had insured Chandlee's automobile.

Chandlee bought a Marion car June 29, 1911, paying for it with cash and a 30 days note for $650, and almost immediately taking out insurance of $1,200, on which he paid a premium of $24. Later he gave a lien or chattel mortgage on the car for the purpose of discounting the note, and when the indebtedness had been reduced to $[illegible] the car was destroyed by fire. The insurance company refused to pay the insurance on the grounds that when Chandlee took out the policy he was not the unconditional owner of the car, but the jury held that though part of the payment was by note, the sale was a bona fide sale and devoid of any conditional element.

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FUEL CONTAINERS THAT MAKE FOR COVNENIENCE

Utensils Developed From the "Milk Can" Type of Measure That Not Only Quicken the Work But Effect Material Economy—Their Points of Difference and Special Features Explained.



DIVERSIFIED DESIGNS OF THE USUALLY COMMONPLACE "GASOLENE CAN"

To most people, to paraphrase a time-honored adage, "a can is a can," and provided its capacity be sufficient for the material in hand, and leaks are absent, little else matters; any variety of can is used for any type of liquid without regard for the fact that, depending upon the characteristics of the liquid, a can of more suitable design may perchance be procurable. When motor vehicles first became popular, for instance, and gasolene stations sprang up in untold numbers, no more suitable container for the fuel—it served at the same time for a measure—than the wide-lipped milk can provided with a handle, was forthcoming; it was forthwith adopted and still persists, despite the fact that can and measures designed specially for the handling of the light liquid are catalogued in untold numbers by the manufacturers of stamped sheet metal goods.

The persistance of the milk can type of measure, however, is more or less in the nature of a habit. The characteristics of the fuel itself, its volitility and inflammability, as well as the characteristics of the vehicle tanks which are positioned in a variety of different places and provided with openings of any size and any shape, as called for by the fancy of the designer or the space in hand, have led to the development of very many cans and measures which are adaptable for the convenient and rapid handling of the liquid, under all sorts of conditions, and which leave little room for the use of the single milk can measure, which must of necessity always be used with a funnel, whatever the size and position of the filler, and which at best is more or less unwieldy. The development of these special cans and measures is not the least interesting of the development brought about by automobiles, and there is greater variety than the unknowing would imagine is the case.

The Atlantic Stamping Co., of Rochester, N. Y., for instance, is producing a combined measure and funnel which is suitable for use where the filler cap is positioned in a place which allows of free access. The funnel takes the place of the lip, and by way of preventing the ingress into the carburetter of large particles of foreign matter which are liable to have a negative effect, a 100-mesh brass strainer is soldered across the passage. The measure is provided with a handle for lifting and a strap hand-hold for tilting, and since the funnel portion covers only the front of the top, the wide mouth feature which made for convenience in filling the milk can type from the barrel, is not sacrificed. The device is made from heavy galvanized iron with seams lapped and soldered, and is graduated in gallons by means of impressed ridges.

For use in connection with rear positioned tanks, the Atlantic device is made in slightly different form and is provided with a spout of seamless metal and with a metal hoop handle for lifting and a conveniently shaped metal handle for tilting purposes. The device is slightly smaller—and is devoid of graduations. A wide filling space and a metal shield for preventing spilling and slopping are provided. Also in the Atlantic line are two types of portable cans. They are similar in shape and both are pro-

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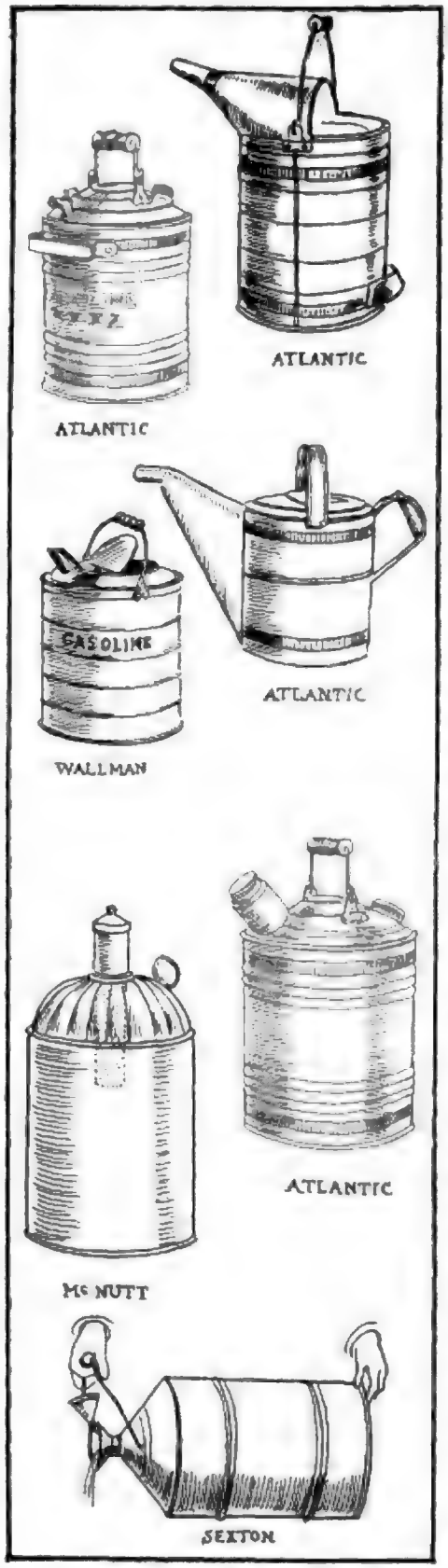
vided with heavy wire handles with wooden grips and are made in both three and four-gallon capacities. In one style a small brass faucet is provided in place of a spout, and by way of ensuring that the faucet will always be at the lowest point when the tank is tipped, a brace of strap iron is riveted across the front of the can and acts as a rest; naturally this type has much in its favor in that the faucet will fit into the mouth of a narrow filler and the tank can be left to empty itself without attention. On the other type a wide spout is provided which is closed during transportation by means of a screw cap. Both are provided with fillers closed by means of screw caps and are ribbed by way of reinforcing the metal.

Variety in Gasolene Can Design.

A combined measure and funnel is also embraced by the Dover line, which is made in Cambridge, Mass., by the Dover Stamping & Mfg. Co. As is shown by the accompanying illustrations, however, the Dover measure differs not a little from the Atlantic type in that it is provided with a wide lip at the rear, so that by tilting the device in the other direction, the liquid need not pass through the relatively small opening provided by the funnel spout. This makes for convenience when transferring the fuel from the barrel to a wide-mouth container or to a tank provided with a wide filler. The sides of the Dover measure slant slightly and the intermediate graduations are not provided. The bottoms are heavy and reinforced against possible leakage.

The Wallmann idea of the ideal gasolene bucket and measure is shown by one of the accompanying illustrations. It is provided with a short, tapered, and at the same time corrugated, spout which protrudes from the side of a dome-like baffle which surrounds the top of the can and prevents slopping; the length of the spout, however, is such that it cannot be injured by contact with a wall or with other objects which are liable to hit the bucket a sidewise blow. A hinged cover tops the whole and prevents both evaporation and spattering, and at the same time allows a sufficient opening for rapid filling. Its maker, the Wallman Mfg. Co., of Milwaukee, makes the bucket in five-gallon size only, with intermediate ridged graduations, and it is made of galvanized steel double seamed and soldered.

By way of preventing damage due to "knocking about," one type of can which is made by the National Enameling & Stamping Co., of New York City, is provided with a wood protective jacket firmly held in place by means of the wood hoops. Like the Wallmann article, the spout is short, so that it is not susceptible to injury and the dome



TYPES OF FUEL CONTAINERS

top is corrugated. Since the can is intended primarily for transportation, the filler cap is small and is provided with a screw cap, as is also the spout. Another Nesco product, which is made only in larger sizes and is intended primarily for the storage of the fuel, is provided with a brass faucet operated by means of a key handle and an iron-threaded filler cap. The sides and the bottom are corrugated by way of stiffening the metal.

Also made by the National company is the Hercules filler can. It is made of extra heavy stock and is provided with a jointed spout which makes for convenience in pouring, and with a very wide filling opening, funnel shaped. A strap handle is provided at the bottom for tilting, and both dome and the sides are corrugated to render it stiff; the can is put out in a five-gallon size only.

Safety Utensils That Prevent Evaporation.

Not the least important point with regard to handling gasolene is the necessity of preventing evaporation in so far as is possible and consistent with rapid dispensation, not only because of the waste which the evaporation involves, which in warm weather might prove considerable where the fuel is handled in large quantities, but also because of the fire risk which always is incurred by the presence of the highly inflammable gasolene vapor. To this end several combined measures and containers have been brought out which are fully closed at all times save when being filled and emptied, and which at the same time are provided with large filling openings and means for emptying of capacity great enough to facilitate matters.

Of this type is the non-evaporating gasolene measure which is another of the Dover products. As shown in the illustration, the device is shaped more or less like the familiar milk can measure with a neck that is slightly narrower than the better known type. Fitting snugly into the cylindrical portion of the neck is a revolvable hollow metal plug or stopper with a V-shaped opening through one side, and a small hole through the opposite side; when the measure is to be emptied, the plug is turned so that the opening registers with the portion of the pouring lip attaching to the neck establishing free passage for the liquid from the container. At the same time the hole in the opposite side of the stopper registers with a similar hole in the neck and provides a vent so that the tank cannot become air bound. Filling is accomplished through the pouring lip. When not in use the stopper is turned slightly and both holes are closed so that the fuel left in the can is preserved. As with other Dover products, great care is exercised in the manufacture to ensure durability and perfection; the device is provided with a wound wire handle.

Another of the type is the Sexton Safety can, made in Boston, Mass., by the Sexton Can Co. In contradistinction to the Dover

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can, which must needs be manually operated, the Sexton can is automatic. Fitted to the generously proportioned filling opening, which also serves as a spout, is a conically shaped brass stopper provided with a handle at the top and with a short chain and a helical spring at the bottom; the spring attaches to the bottom of the can and serves to draw the stopper into the closed position when the handle is released. Spilling, it is claimed, is an impossibility, no matter how full or in what position the can may be placed because of the tension of the spring and the fact that the stopper is ground to a fit; by the same token, evaporation also is impossible.

The Nesco safety can is novel in that it is provided with a pump for emptying the liquid. As shown in the accompanying illustration, the pump is mounted in a removable plate which covers the generously proportioned filler opening so that when the tank is being filled the pump is removed; a hinged cover closes the filler opening when the pump is not in place. By way of ensuring rapid transferral of the gasolene from the can to the tank of the car or other container, the pump is made double acting, so that it delivers a continuous stream.

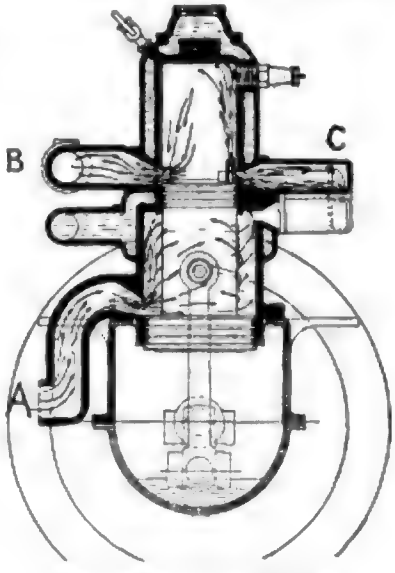
Interest attaches to the Non-Explosive can, which is exploited at 352 Pearl street by the McNutt Non-Explosive Can Co., because of the fact—as the name would imply—that the maker claims that it is absolutely impossible for the can to explode under any conditions whatsoever. This freedom from bursting is brought about by virtue of a fine brass gauge caging which attaches to the filler and through which the liquid must pass. Naturally the principle is the same as that involved in the construction of the Davy safety lamp; the brass gauze cools the flame before it can pass to the gases within the tank.

But however great have been the strides made in the improvement of gasolene cans and measures, it is very doubtful if other than a comparatively few of the most progressive of those who dole out the fuel have or will adopt the "new fangled" devices. For those who do not, it might be said that while the milk can type of measure remains the milk can type in shape, it has been improved not a little since it first was applied to the measurement of gasolene; improvements being chiefly in the nature of greater weight of the metal and added reinforcement which make for durability, and improved soldering and galvanizing methods which point in the same direction. Also in cases where the bottoms have not been reinforced, they have been raised slightly to eliminate contact with the floor and prevent undue wear. As a matter of course, the same applies to the newer types of gasolene measures.

TWO-CYCLE MOTOR THAT RUNS ON VARIOUS FUELS

Has Differential Pistons and Burns "Gas," Kerosene or Denatured Alcohol—Revelations of a Demonstration.

One of the most recent of the many efforts constantly being made to eliminate the faults of the conventional type of two-cycle motor without losing the great advantage of simplicity is shown in the accompanying illustration, which is a cross-section of one cylinder of the Fraser-Brimmer engine, manufactured by the Superior Motor Co., of Detroit, the first of which has been undergoing public demonstration in that city. There are no more moving parts than in the common or garden variety of two-cycle motor, but the piston is of the two-diameter type, as is also the cylinder, and the ports and transfer passages are arranged in an unusual way.



FRASER-BRIMMER MOTOR

Apart from obvious simplicity, there are several advantages that are possessed by the new engine. The method of handling the gas makes back-firing impossible, and there is no crank-case compression and, consequently, no possibility of crank-case explosions. Side thrust per square inch of piston surface is very low because of the length and the large bearing area of the pistons.

The engine is built in units of two cylinders for the reason that the lower piston of one cylinder pumps the charge for the working or upper chamber of the other cylinder. The working cylinder has the usual intake and exhaust ports uncovered by the piston, but the intake port C is connected with the pumping chamber of the other cylinder. Each cylinder has its own intake pipe A and its own carburetter. The exhaust pipe and port are of the usual kind.

The two pistons of a pair of cylinders are set opposite, one being at the top of its stroke while the other is at the bottom. On the down stroke a partial vacuum is formed in both working and pumping chambers. Near the bottom of the stroke the port at the bottom of the pumping chamber is uncovered by the piston and a charge from the carburetter rushes in to fill the void. At the same time the ports in the working cylinder are uncovered, a new charge taken in and the exhaust discharged. On the upstroke the working piston compresses its charge in the usual way; the pumping piston compresses a charge of fresh gas, and when the working piston of the other cylinder uncovers its intake port this charge rushes in.

No check valves are required because the ports are all controlled by the pistons. The two cylinders, in the case of a double-cylinder motor, are enclosed in a common water-jacket of large capacity. As is the case in four-cycle motors, the crankcase serves merely as a support for the bearings and a housing for the cranks; the motor could be built with an open base. Both automobile and marine types will be built, according to the plans of the company, which plans to turn out a considerable number of engines during the current year.

In operation the engine, which is equipped with an E. C. B. carburetter, apparently is able to use as fuel gasolene, half gasolene and half kerosene, pure kerosene or denatured alcohol, and its flexibility and power on all of these fuels varies so slightly as to be scarcely appreciable. Running on an electric dynamometer brake, in a recent test in Detroit, all of these fuels were fed through the standard carburetter one after the other, the engine being permitted to cool—cold running water passed through the jacket continually—between each. A single squirt of gasolene injected through the petcocks sufficed to give the initial explosion, after which any of the fuels apparently gave the same power and efficiency.

Engine Tests Supply Washroom Water.

The economy that results from the utilization of the power developed while "running in" motors preparatory to installing them in the chassis is taken advantage of at not a few motor car factories. It is doubtful, however, if the economy generally is carried as far as is done in the Cadillac plant, where not only the power developed by the motors being tested is utilized, but the water which passes through the cooling jackets is piped to be utilized in the washrooms, and at other points where warm water is necessary or desirable.

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GEARLESS DIFFERENTIAL THAT RELIES ON GRAVITY

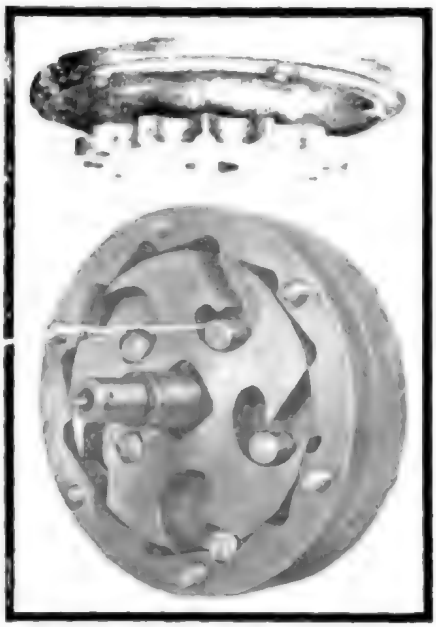
Company Formed to Exploit Unusual Device that Eliminates Gears, Springs and Friction—Now Undergoing Tests.

The shortcomings of the very common variety of differential mechanism, or as it sometimes not very properly is styled "equalizer mechanism," long have been known to the engineering fraternity and to the layman alike, and though there have been numerous attempts to replace it with something else, as is attested by the patented inventions of such noted engineers as Thomas B. Jeffery, Alanson P. Brush and others, such substitutes have not always proven all that could be desired and never have cut any figure in the trade. The principle difficulty with such devices has been that reliance has been placed on pivoted pawls and springs or frictional contact, the former permitting a certain amount of lost motion and the latter not infrequently resulting in either binding or slippage.

To obviate both of those disadvantages, to say nothing of several more, and to eliminate the necessity for the usual type of gear differential, the Gearless Differential Co. of Detroit has brought out a device in which the problem has been attacked in a slightly different manner than it has been attacked in the past. The device is styled the Gearless differential and is the invention of George D. Bailey, who is head of the Gearless Differential Co., recently incorporated and capitalized at $50,000 and having temporary headquarters in the Ford building in Detroit. Associated with Bailey are C. S. Ferguson, of the Imperial works of Flint, Mich., who is vice-president; E. O. Knight, who is treasurer, and Frank Howarth, of the Monitor Automobile Co. of Janesville, Wis., who is to be secretary. Though the device has only been perfected a short time, it already has attracted the attention of the Timken Detroit Axle Co. and is being given a try-out on a truck, and it is understood that several other companies have made overtures for the right to use it.

Strictly speaking, the Gearless differential is an adaptation of the ratchet and pawl principle, as may be judged by the accompanying illustration, which shows the device with the outer plate removed exposing the mechanism. Though the device shown is of the type developed for commercial vehicle work, where two such mechanisms are employed, one on either end of the jackshaft, it is equally applicable to pleasure cars and under such conditions takes up no more room than the orthodox type of gear differential.

The operation of the mechanism is quite simple and depends primarily upon gravitation, friction having been eliminated as an essential to its functioning. When the vehicle is driven forward, from rest, the inner member rotates a short distance until one of the loose pins drops into the position shown by the picture between the face of its curved slot and the corresponding face on the outer member to which the driving sprocket is attached. Hence, as the inner member can move no further, its movement being blocked by the pin, it carries with it the outer member and the driving sprocket. Thus, if the vehicle is making a turn, the



BAILEY GEARLESS DIFFERENTIAL.

outer, or faster moving wheel, receives no drive but over-runs the inner wheel, which, temporarily, takes all the drive. Similarly, when one wheel of the vehicle is on slippery pavement, under which condition the ordinary type of gear differential would cause all the power of the engine to be transmitted to it (which makes plain the incongruity of the term "equalizer") the power is transmitted to the wheel that is capable of the greater tractive effort. When the driving power is released, as when the vehicle is coasting, the inner member automatically releases itself, gravity causing the pawl pins to roll up into their peculiarly shaped slots.

Actually, each of these members is a double member, so to speak, with two pawl cams and two sets of pins. The second set, not shown by the picture, is for use in braking and backing and obviously operates in the opposite direction. In reversing the direction of the vehicle, the housing is released from engagement with the pawl cam until the shaft makes one-eighth revolution when it locks in the opposite direction. Thus, when a braking strain is imposed on the wheels it must be equally distributed by reason of the action of the pawl cams. Further, it is pointed out, if one brake were removed, the braking strain still would be equally distributed by reason of the action of the pawl cams.

By way of positively eliminating the shock and jar of starting when the pawl cam pins drop into position, the pawl cams at either end of the shaft are set one 45 degrees ahead of the other, the immediate effect being that one-eighth revolution of the driving shafts in either direction locks the rotating part to the driving sprockets. The jar incident to locking within one-eighth revolution, it is stated, is so slight as to be practically negligible in its effect on depreciation.

Determining Stress by Optical Means.

To the "man in the street," the ways of the engineer may appear obtuse, though they should prove none the less interesting, if served in an appetizing manner, for the reason that they lay bare at least some of the methods by which the factor of safety is increased and the worry of the owner or the dealer over breakdowns decreased. In this respect probably none of the operations of the modern engineer is likely to appear more obtuse and less interesting on superficial examination than the comparatively recently perfected method of determining the stress in metals by optical means.

But that the operation is interesting nevertheless and is of vital import to dealer and user alike is revealed by the fact that with the aid of celluloid models of gears, for instance, the engineer is enabled to tell almost at a glance just how much strain similar gears made of steel will withstand and where they are most likely to rupture. From which, obviously, it is a simple matter to strengthen those parts where the greatest strain comes and in this way to insure against breakage. Formerly, glass models were used for the purpose, but owing to the brittleness of the material it was impractical to subject them to strains in proportion to the strains sustained by similar metal parts.

Latterly, some of the nitro-cellulose compounds akin to celluloid have been used, and it has been found quite possible to subject gears made of these materials to strains quite as great as the strains that must be sustained by ordinary gear wheels in practice. Strains, under the circumstances, appear in the light that is used—it is styled polarized light—as color fringes and indicate exactly where the internal stress exists and how best it may be provided for in the finished gears or other parts that have been tested "by proxy."

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DEALERS WHO MAKE A SCIENCE OF SERVICE

Brooklyn Distributers Delve Deeply Into Task of Pleasing Those to Whom They Sell Cars—Little Conveniences That "Count Large"—Intelligent Definition of Real Service.

In many different sections of the United States it is generally the rule that some car or cars predominate in number, while other makes which are the favorites in other localities are in a minority; and for every such situation there is a reason. The manufacturer himself may not know the reason; he may believe it is because his dealer is a good salesman, is able to sell cars and got a good start when the trade was young, and the successful dealer's competitors may declare it is because he "got the jump on them" when the trade was in its earlier growing stage.

What Lies Back of Trade Leadership.

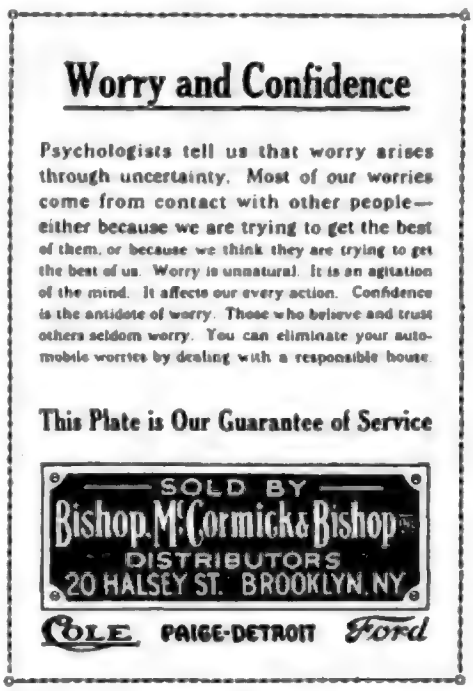
Perhaps all these things are true: the dealer doubtless is a good salesman, he probably did "get the jump" on his competitors, but an analysis in most instances will show that, coupled with his salesmanship and back of his "jump" is the fact that his very name connotes service—that whenever the dealer or his car is mentioned there at once flashes into the mind of the motoring public a picture of a big group of owners who swear by their dealer and are immensely satisfied with their purchases.

Should a car owner spend much time in Brooklyn, N. Y., and on Long Island he doubtless would discover from his frequent contact with other motorists that Paige, Cole and Ford cars are immensely liked, that their owners declare that when their present cars enter into their dotage they will make another purchase of the same kind of car, and should his investigative sense prompt a running down of the reason he would find it in the service department of Bishop, McCormick & Bishop at 20 Halsey street, Brooklyn.

Gets License as Part of System.

Bishop, McCormick & Bishop believe in service with a great big S. Caring for the comfort and convenience of their owners is a science with them; they even go so far as to provide a notary public at their office, where a car owner may make out his application for a license, and after he has made it out the service department attends to the rest—it gets the license and delivers it to the owner. The matter of the replacement of possibly defective parts is taken up with these dealers and not with the manufacturer with the dealer as a mere medium; if a man believes a part should be replaced, he settles the matter with Bishop, McCormick & Bishop and does not have to enter into a long distance discussion with the factory, as is too often the case.

How much in earnest these dealers are is shown by their early experience with the



AD. THAT PREACHES SERVICE DOCTRINE

Dragon car. The company which made it went into the hands of a receiver shortly after Bishop, McCormick & Bishop had taken a number of orders and delivered several cars; instead of throwing the blame upon the defunct Dragon company they bravely shouldered it and went to unlimited trouble to keep their moral compact with those who had bought Dragon cars; and as they did in that day, so they do to-day.

The members of the company are: Eli H. Bishop, president; Button T. Bishop, vice-president; Clifford M. Bishop, secretary; John McCormick, Jr., treasurer, and John McCormick, and every one of them is alive to the value of service.

Knowing how an owner values service, the company recently ran a series of "service advertisements" in Brooklyn newspapers. In these, little mention was made of the cars sold, but the attention that is given after a sale is made was emphasized. Those ads developed great pulling power, and when the series was well under way its arguments were incorporated in a book entitled "Behind the Scenes." The first edition of 2,500 was soon disposed of and 5,000 more are now being distributed. The Cole manufacturers sent for a bundle to distribute among all Cole dealers, and the service story has aroused comment. The book tells the same story that Clifford M. Bishop, the secretary, told a Motor World man when showing him through the plant, which narrative, in part, follows:

Service of Early Automobile Days.

"In the early days, a service department meant real serious trouble. It meant continual argument wherever a question of responsibility was involved. Unscrupulous dealers took to advertising the sale of their cars free of repairs. They never intended to do anything free if they could help it. They only wanted to sell their product and then squirm out of their responsibility under any conceivable pretext. That made it hard travelling for the responsible dealer. The automobile business was certainly a 'game.'

"It should be easy to understand why a concern with good intentions towards its customers has been inclined to go easy where questions of service were involved—why they have hesitated to sell their cars on the basis of service. The questions of responsibility were always involved—vexing arguments were a matter of course. Factories were so busy building their current models, designing their annual new models and getting their selling agencies established, they had little time or attention to give to the cars already in service.

How Standardization Wrought Benefits.

"But standardization has solved the problem. It has reduced the number of models and the number of parts to each model, reducing also the cost of manufacture. It has simplified the handling of replacement parts and made real service possible. The result is increased prestige to the big dealer. He can now carry an adequate stock of repair parts. He can and should maintain a real local service station.

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"We admit at the start that service is a mighty big word. What does service mean in any business? Perhaps the finest examples of service under unusual conditions is the Telephone company. Another is the department stores. There it is possible for us to buy everything we need. What are the railroads doing to-day? Within the last year it is possible to call up the railroad office on the 'phone, secure our tickets and have them sent to us. And in hotels the entire proposition is one of service.

Courtesy and Knowledge of Business.

"Perhaps the first thing about service is that it should be courteous. Yes, and it must be intelligent. A stupid servant is worse than no servant at all. Therefore, if one is to give real service that person must know his business thoroughly from beginning to end.

"Perhaps the most important point is efficiency. The service must be right. What does it matter if the telephone company gets a number for us in a hurry if it is the wrong number, or if the department store delivers the package for us quickly if it is the wrong package, or the railroad carries us quickly to the wrong destination, or the waiter hurries in with the wrong dish? The service must be efficient. It must be right.

"Finally, the cost. The price of service must be reasonable. Competition establishes that point. Now we have it:

"Real service is intelligent, speedy, efficient and reasonable as to cost.

Lost Money Pays Excellent Dividends.

"We lost a lot of money on the Dragon proposition, but we do not regret one penny of it. It has all been charged up to experience, and has paid very excellent dividends ever since. But we did not stop at satisfying ourselves as to the financial responsibility and dependability of the concerns we have represented in the years subsequent to the Dragon incident. We resolved to develop our force to a point where we could have our own experts to pass on the products of the various factories. We were all through taking the promises of any company that they would make good later on present defects in the cars.

"Every car we sold after that had to be right before we would handle it.

"But that did not cover slip-ups that were bound to occur in any manufacturing concern, so we developed our own inspection department so that we could go over every car we received and make sure it was right before it passed into the hands of a customer.

"But we had to go another step. That took us to the instruction department. Experience has shown us that most cars were made or ruined in their first 500 miles of running, and we figured out that if through our engineering force we could select a type of car that was as nearly perfect as possible in every detail, thoroughly inspect every one of these cars as it was received and then instruct the customer properly in the driving and handling of that car, watch him carefully for the first 500 miles, the matter of guarantee would take care of itself.

"Most cars are in service eight or nine months of the year. If a man is going to run out the amount of his investment his car must always be in shape to run. The dealer should assume this responsibility. There is only one way he can undertake to keep the cars he sells running, and that is by a substantial investment in service.

"No matter how much he hates and detests the detail and hardship of a repair department he should maintain an efficient one. He should employ the most capable men he can secure, so that he will be able to turn to any emergency work that may come in and rush it through as quickly as possible. But of what use is it to have these men if he does not also have on hand every part that goes into the making of a car.

"We have one of the largest repair shops in the East. We have at our disposal in our own plant or within 45 minutes of our plant (for we co-operate with New York and Newark on the parts end) at least $30,000 worth of parts for every car we handle.

"But the old argument comes up—of what use is the speed of the service if the service is not right? Efficiency! We are working hard and intelligently for perfect efficiency. Our repair department is maintained purely and simply as a service proposition to take care of the cars we sell. Yet we run it in a perfectly systematic manner. Every man in our employ must account for every minute of his time from eight o'clock in the morning until six o'clock at night.

Making Specialists of Repairmen.

"So much for the detail end of it; but when one comes to the human element one meets variations that no system can equalize. It has therefore been necessary for us to study our employes and to put them at the kind of work they are most adapted to. We have therefore specialized in our repair department as to men. We have certain men that are especially adapted to the adjustment of carburetters and ignition systems. We keep them on that work. We have other men who are especially efficient at fitting bearings. We keep them there for that work. In this way sometimes four or five men will work on a job at different times, each one a specialist in his line. And when the job is finished it is tested by the foreman and if O. K.'d by him is sent from the shop to be tested by the road men.

"To further increase the efficiency of our service we maintain what we call our speed service squad. This squad consists of picked mechanics thoroughly familiar with all our cars who travel on motorcycles and who can reach any customer in trouble within a few minutes.

Will Maintain Low Labor Charges.

"As to the question of cost, our labor charges have always been lower than those of other concerns of similar standing and reputation. We intend to keep them there, because we are in the business of selling automobiles and with these automobiles we sell service and it is not our intention or desire to make a profit on service. Furthermore, this organization is at the owner's disposal for minor adjustments without cost. He is urged to bring his car to us every month, or oftener if he likes, for free inspection and advice. Our supply department is at the owner's service for advice and equipment. Our garage has 26,000 square feet of floor space, all on one floor, with a roadway encircling the entire building, and every car faces this roadway."

The B., M. & B. service garage is imposing, with its length of 265 feet and width of 125 and 165 feet at different ends, and also, the story of the department is apparently impressive to motorists. One day a prospective purchaser walked into the company's salesrooms to ask about a car. As he was about to go a salesman, reaching for a booklet, asked, "Have you seen our booklet 'Behind the Scenes'?"

"Yes," replied the motorist, "I wouldn't be here if I hadn't."

Satisfaction

Satisfaction is another big word. Some of us are satisfied to exist. Some of us must not only exist, but we must live and live well—have pleasure, comfort, enjoyment and even luxury before we are satisfied. When you come to think about it, a man who sells automobiles to a great number of people and promises them satisfaction is tackling a mighty big proposition. If he is honest, he must have every facility for giving that satisfaction—experience, knowledge, equipment and capital. When some one attempts to sell you a motor car and promises you satisfaction size him up by this standard, examine his plant and equipment and then judge his honesty of purpose.

This Plate is Our Guarantee of Service

SOLD BY
Bishop, McCormick & Bishop
DISTRIBUTORS
20 HALSEY ST. BROOKLYN, N.Y.

COLE PAIGE-DETROIT Ford

ANOTHER BISHOP SERVICE AD.

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HOOSIER CITY SHOW HOUSED IN COLISEUM AND ANNEX

State Fair Grounds Location Chosen Instead of Mid-City Tented Exhibition — Pleasure and Commercial Vehicles Mixed.

No flimsy structure improvised of many poles and much canvas houses the second annual show of the Indianapolis Automobile Trade Association, which opened up in the Hoosier City on Monday evening last, March 24th, and will hold sway throughout the remainder of the present week until Saturday evening next, March 29th. For unlike last year's affair, the present exhibit is housed in the Coliseum and annex on the State Fair grounds and, although the building is some distance removed from the center of the city, satisfactory arrangements with the street car company by which service that leaves but little to be desired has been established.

Both buildings are draped—and by "draped" is meant that not the smallest patch either of ceiling or of wall is left uncovered—with bunting, following for the better part the red, white and blue color scheme, though at intervals purple and white, emblematic of the trade association, predominate. National flags are artistically grouped around the pillars which serve to carry the roof girders, and the very many arc lights and clusters of var-colored incandescents which have been added to render the hall bright, add much to the eye-pleasing effect.

Vehicles to the number of 55, intended for both pleasure and commercial purposes, and each the product of a different factory, are shown by the 45 dealers and manufacturers who hold space. Of the number, no less than half a dozen of the 42 pleasure cars and four of the 13 commercial vehicles which are shown are local products. Nothing new, however, with a possible exception of the Richmond car, which has not been previously shown during the present season, cropped out. The car is of conventional design, employing a four-cylinder block-cast, L-head motor mounted in a sub-frame with the three-speed transmission; drive is through a cone clutch and propeller shaft to the semi-floating rear axle. The car is displayed by L. B. Elmore of Remington, Ind.

In the matter of accessories, quite a formidable showing is made by the three dozen dealers in motor car appurtenances who hold forth on the hanging balcony which was improvised for the purpose. In their lines, however, there is little that is new and nothing that is startling.

The pleasure cars on view are: American, Auburn, Apperson, Buick, Cadillac, Case, Chalmers, Chevrolet, Cole, Detroiter, Ford, Glide, Great Western, Haynes, Henderson, Hupmobile, Hudson, Jackson, Krit, Locomobile, Lozier, Little, Maxwell, Overland, Packard, Pierce-Arrow, Paige-Detroit, Peerless, Premier, Pathfinder, Regal, Reo, Richmond, Republic, Studebaker, Stutz; Baker, Detroit, Ohio, Broc, Waverley and Woods electrics. The trucks displayed are: Avery, Buick, Case, Federal, Mais, Marmon, Overland, Packard, Premier, Reo, Studebaker, Walker electric and Waverley electric.

Circus Performer at Norfolk's Show.

Circus stunts accompanied the opening on Monday evening, March 17th, of the second annual show of the Norfolk, Va., Automobile Dealers' Association, which held sway in the Armory Hall throughout all of last week until Saturday evening, March 22nd. Not only did a lantern parade precede the formal opening, but a circus performer—Daring Daro by title—was on hand and awed the spectators by allowing a fully loaded three-ton truck to be driven and redriven over various and sundry parts of his anatomy; all of which had its effect on the box office receipts.

Twenty-two different makes of motor vehicles, both pleasure and commercial, were shown by the 13 dealers who held space; accessory dealers, half a dozen strong, had comprehensive displays of motor car appurtenances. Decorations comprised red, white and blue draperies and streamers and flags artistically arranged to conceal bare walls and the ceiling.

The cars shown were:

Ford, Chalmers, Mitchell, Mercer, Michigan, Waverley electric, Pope-Hartford, Lozier, American, Rambler, Overland, Pierce-Arrow, Cole, Kline, Buick, Locomobile, Haynes, Studebaker, I-H-C commercial, Reo, Case, Little.

Sure Number Lamp Has Trouble.

While the Sure Number Lamp Co., of New York City, which some two years ago undertook to make and market a tail lamp and license tag illuminator, apparently still has faith in the efficacy of its product, financial reverses have followed a more or less unsuccessful attempt to invade the trade, and this week judgment for $735.02 was filed against the company in the New York county clerk's office as the result of the Sure Number's failure to meet a note; the holder was Charles H. Potter, of New York.

The protested note, which was given November 26, 1912, was endorsed by Frederick Robinson and Anton H. Wolter and was of the face value of $700.

SAYS STRINGENT LIABILITY LAW IS UNCONSTITUTIONAL

Michigan Court Relieves Car Owners of Fearful Burden of Responsibility—Owner Who Was Sued Wins on Appeal.

That there are limits to the liability of the owner of a motor car and that he cannot be saddled with the blame for all misdeeds committed by any and every driver of his car was held last week by the Supreme Court of Michigan, which declared unconstitutional a statute enacted in 1909 and which made a car owner liable at all times, with the one exception that he should not be responsible for his car's conduct if the vehicle were stolen. The clause in question had hung over the heads of Michigan motorists for four years and was regarded as one of the most radical pieces of automobile legislation in existence because of its far-reaching effects.

The case which brought about the decision is illustrative of the workings of the law. Three years ago William S. Thomas, of Grand Rapids, sent his car to a repair-shop, and after the work upon the automobile was completed a repairman took the car out for a test and, while so engaged, he ran into Miss Nina L. Dougherty. Under the law she could—and did—bring suit against Thomas, and recovered damages in the Circuit Court for Kent county, although Thomas had no control over the car at the time of the accident and the driver was not agent, employe or servant of the car owner. The Supreme Court decision was rendered upon an appeal, the higher court reversing the verdict and denying a new trial.

The clause, or subdivision, declared unconstitutional read:

"The owner of a motor vehicle shall be liable for any injury occasioned by the negligent operation by any person of such motor vehicle, whether such negligence consists in violations of the provisions of the statute of this State or in the failure to observe such ordinary care in such operation as the rules of the common law require, but such owner shall not be liable in case such motor vehicle shall have been stolen."

The court, in commenting upon this section of the law, said:

"To hold this subdivision constitutional, is to hold a party absolutely liable for the negligent conduct of another, a mere stranger or a willful trespasser, no matter how careful or how free from negligence he himself has been.

"We think the result of such a holding would be to take the property of defendant, Thomas, to pay for the wrongful and neg-

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ligent act of another person, not sustaining to him the relation of servant, agent, or employee . . . .

"Such a doctrine seems unnatural and repugnant to the provisions of the constitution here invoked.

"We are forced to the conclusion that the provisions of this subdivision are not a necessary regulation in the exercise of the police power; that in and by its terms the plain provisions of the constitution are violated and the subdivision must be held unconstitutional, and the statutory liability therein asserted done away with."

However, this section does not affect chauffeurs, as the paid driver is regarded as a servant or agent, and his employer may be held responsible for his actions.

Springfield's Show Housed in Arsenal.

Twenty-eight different makes of motor vehicles for both pleasure and commercial service, which were shown by 15 dealers, comprised the third annual show of the Springfield (Ill.) Commercial association, which closed its doors in the Arsenal on Saturday evening last, March 22nd. The show was inaugurated on Wednesday evening, March 19th. White, green and red was the color scheme, which was preserved throughout the decorative setting, which comprised, besides the orthodox streamers and draperies of bunting concealing the bare walls and ceiling and myriad lights of many colors, a large pergola which surrounded the hall. The cars on display were: Cadillac, Lozier, Hudson, I-H-C truck, Oakland, Chicago electric, Overland, Henderson, Paige-Detroit, White, Baker electric, Stutz, Marion, McFarlan, Flint truck, Michigan, Little, Case, Marathon, Metz, Pierce-Arrow, Waverley electric, Pathfinder, Haynes.

Suggests the Papier-Mache Bodies.

"Why not papier-mache bodies?" inquires a British motorist, and goes on to explain their advantages. The papier-mache, he says, might be pressed into the interstices of wire netting stretched over a light steel framework; it would have the advantage of lightness, great strength and cheapness, and in addition enamel would have less tendency to chip off it than it would off steel or aluminum.

To Break Ties in Ajax Tire Contest.

In the announcement of the Ajax-Grieb Rubber Co.'s tire-mileage contest made in last week's Motor World, it was stated that in the even of ties arising, the awards would be decided by the drawing of lots. This provision has been so amended, however, that in case of such ties, the cash prizes offered will be equally divided between the chauffeurs concerned.

KEEPING CARS FROM STAIN OF SHOP DIRT AND GREASE

Simple Arrangement that Avoids a Marred Finish and Saves Trouble —Devised by Chalmers, Is Useful to Whole Trade.

One little grease spot which has had time to work its way into the glossy finish of an automobile body has done an injury which is reparable only at considerable expense, and in too many repair-shops and garages no repair is attempted when a practically new car is turned out, bearing upon its finish the marks of uncareful workmanship. That the garageman makes no attempt to remove the soiled spots is perhaps excusable, for this in many cases would involve the refinishing of the whole car, but that he permits his workmen to dirty up a car is far from meriting excuse when prevention is a matter of no more difficulty than cutting and fitting a couple of strips of suitable material.



CHALMERS METHOD OF KEEPING CARS CLEAN IN THE SHOP

Bearing in mind the chagrin felt by the owner who takes his formerly spic and span car from a repair-shop only to find it spotted with dirt or grease, the Chalmers Motor Co., of Detroit, Mich., has recommended to all its dealers a method which has been used by that company to prevent finished parts from becoming marred or damaged, and the simple device is one which might well be adopted by any dealer, garageman or repairman at an expense which would be far below the value to be derived.

The protection is nothing but sheets and strips of a comparatively soft canvas or some other similar cloth, cut and fitted so that it may be attached to a car, as shown in the accompanying illustration. This ensures that the car will leave the shop looking as well as when it went in, and the result is three-fold.

Not the least important result of the use of such a device is that the workmen are impressed with the fact that care is necessary in their work and that cleanliness is required in labor upon cars which come into the shop; should a mechanic discover a spot which did not happen to be protected, he is likely to avoid marring it because the protection of the other portions has emphasized to him the necessity for careful work.

The owner will not overlook such methods; he is made to know that the repairman appreciates the fact that he has in his hands a piece of property of value and that the repairman is striving to take the very best care of it while it is in his possession. Should there be slight cause for complaint regarding carelessness, the owner who has seen such a device in operation is less likely to believe ill of the shop as a whole. Moreover, he is more assured of being a satisfied customer—which is an excellent advertisement.

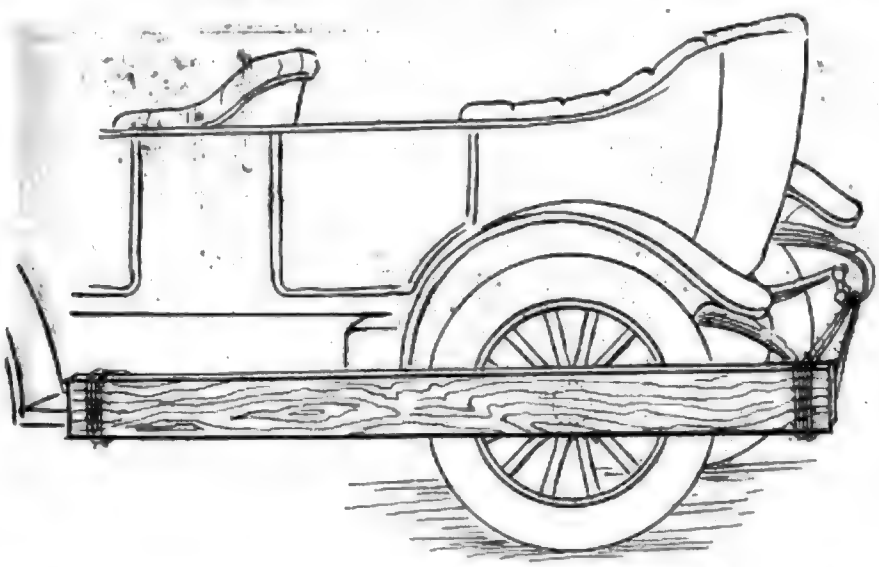
The shop owner himself gets a benefit from the use of the protectors; he feels more satisfied with his establishment and takes greater pride in its modernness. Among car owners he will gain a reputation for thorough work, and when it is figured up that an hour may be spent by one man in cleaning up one car, the saving effected by the cloths and the time in which they will pay for themselves do not require an expert mathematician.

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BOARD AND SHINGLE NAILS THAT SAVED A SITUATION

Crude Devices Impressed into Service by Kansas Dealer When Live Axle Broke—Necessity Again the Mother of Invention.

It goes without saying that there are accidents of lesser moment than the complete smashing of a car that will actually prevent its running, baffling the smartest of emergency repairers; but every once in awhile someone of a practical turn of mind is brought face to face with an apparently hopeless case, goes to work and solves the problem and scratches one or more casualties from the "hopeless" list.



METHOD OF FASTENING PLANK TO HOLD LOOSE WHEEL IN PLACE

Something of this sort happened recently when P. P. Belt, who is the proprietor of an automobile establishment in Fredonia, Kan., got into trouble 14 miles from home and help. One of the axle shafts in the semi-floating rear axle of his car snapped off about two inches outside the differential, and the entirely natural result was that the differential gears spun round idly, imparting no motion to the remaining sound shaft and its wheel.

Another car was at hand, so a connection was established by means of a tow-rope, and a start made for home. Immediately, however, the broken shaft commenced to work out of the axle housing, pushing the wheel out at the same time and making even towing impossible. So the other car went its way, leaving Belt to scratch his head as a preliminary to doing something more likely to enable him to get away from there.

The first thing to be done was to prevent the rear wheel from parting company with the car. The hub-cap was removed and a recess hacked half way through an oak plank, which was found lying around waiting to be used, the recess being big enough to take in the hub of the wheel. The plank, which was 7 feet long, 2 inches thick and 6 inches wide, was put up with the recess over the hub and wired in place, one end to the running-board and the other to the rear end of the rear spring on the opposite side of the car; the running-board end was further secured with a spike which acted as a pivot when the car rose and fell on its springs. So the wheel was restrained, so to speak, and all was ready for towing home.

But unfortunately the main item in the towing equipment was lacking; there was no car and not a horse to be had. So Belt had to scratch his head again, and in short order he scratched out of it a scheme that took him home under his own power. He removed the cover from the axle housing over the differential and plugged up all but one of the openings in the differential casing with waste. Through this opening a good handful of shingle-nails was dropped and the last hole stopped up so that the nails could not get out of the casing.

Of course, the nails got into the differential gears and effectually locked them, preventing their turning and compelling the power to be transmitted along the good shaft to the wheel. And with an oak plank holding one wheel on the car and a handful of shingle-nails transmitting power to the other, Belt drove home, 14 real miles, and got there without a hitch. To be sure, the roads were smooth, there were no hills and the car was started up very gingerly and driven all the way without any attempt to break speed records or perform stunts; but the fact remains that it got there without outside assistance.

CONDITIONS AFFECTING CHOICE OF ACCUMULATOR

"Punishment" that the Battery Will and Will Not Stand—Wisdom of Applying a Battery of Proper Capacity.

There are few of the adjuncts to the motor car that require more careful consideration than the storage battery, whether it be used as a component of the electric starting and lighting system or as the source of current for the propulsion of an electric vehicle. The care or lack of care exercised in selecting the proper equipment for storing current will be reflected with unfailing directness in the results obtained in service, and the results will manifest themselves in terms of dollars and cents—not infrequently more dollars than cents.

A battery may have the proper number of cells to give the required voltage and yet be woefully lacking in amperage, for while the number of cells governs the voltage, or pressure, it has nothing to do with the amperage, or the volume of current. Amperage output is a function of the area of plates exposed to the electrolyte. The more plates there are the higher will be the amperage and, of course, the same result is obtainable by the use of larger plates. One cell has the same ampere-hour capacity as the whole series-connected battery, but has only the voltage of a single cell—two volts.

Current can be drawn from a battery at a rate very greatly in excess of its normal discharge capacity, and the plates will invariably respond to the demands made upon them. The penalty of an excessive discharge, however, is paid in the rapid increase in deterioration of plates, which overheat and disintegrate at a rate which rises rapidly with the overdraft. There are two ways in which a battery can be overtaxed. Current may be drawn too rapidly, as, for instance, taking current at the rate of 150 amperes per hour when the battery is normally rated at 100 amperes, and, again, drawing current at the normal rate, or even less, but continuing to work the battery after it has been discharged to the normal limit. A battery is capable of giving considerable current even after it has been worked to a normally discharged condition. In extreme cases current can be drawn from a battery until it "goes dead" and cannot produce sufficient energy to do any work, but after a rest there will be a recuperative action that will enable the plates to again give forth a current. In both cases, however, the battery suffers severely.

Obviously, if a battery is too small for its work it will be necessary to draw to a

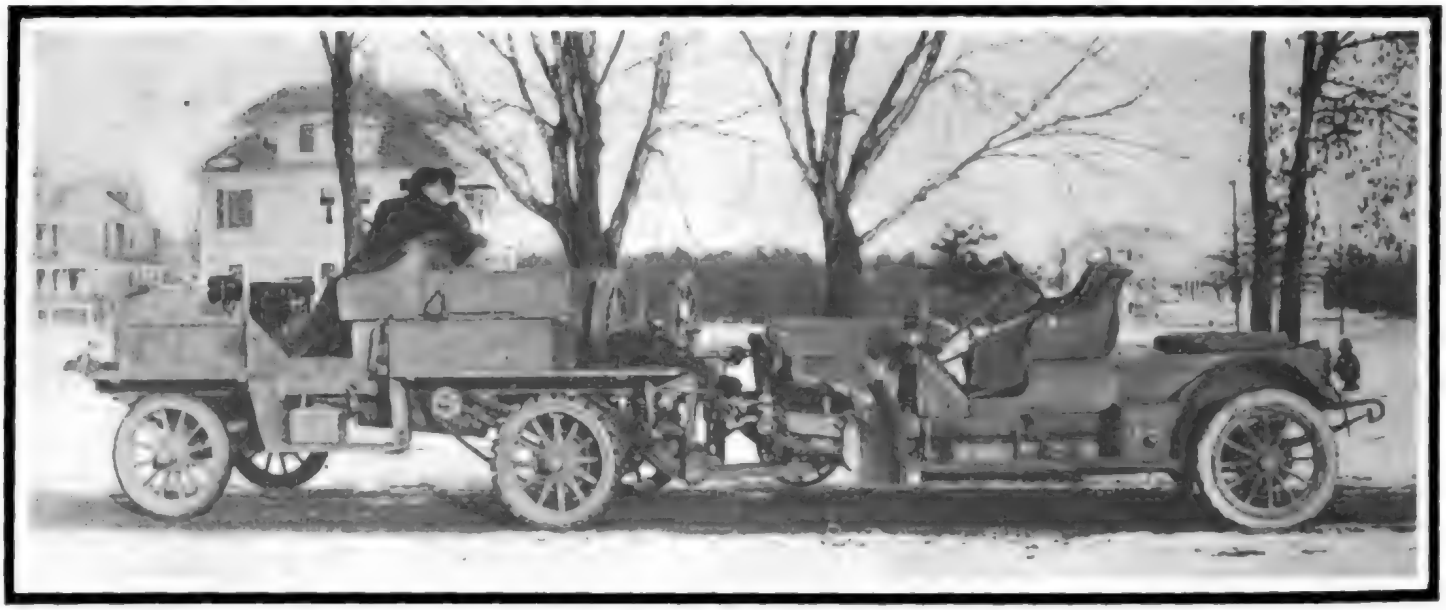
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greater or less extent upon its "reserve vitality," so to speak, and so cut down its useful life. The battery may do its work satisfactorily for the time being; it is one of the characteristics of a storage battery that it will continue to "give up" until it destroys itself in the effort to keep pace with the demands made upon it. The end will be brought much nearer the beginning, however, than it ought to be. Consequently a new set of plates will have to be purchased after an abnormally short period of service, and the expense per mile, or per hour, or however it may be figured, will be excessive.

Too large a battery, on the other hand—that is, a battery that has a plate area and an ampere-hour capacity considerably in excess of the demands made upon it—involves an abnormally high first cost, it requires more space, is heavier to carry and less easily handled than one of normal size. In its regular service the discharge will never reach the point of normal exhaustion, but the plates will be partly discharged and then re-charged over and over again—a proceeding which may be likened to winding a watch twice a day so that the full capacity of the spring never is used. In the case of the battery the proceeding is not conducive to the longest life of the plates, which give the best results and the longest life when continuously worked at approximately the normal rates set by the manufacturers. A battery long unused is sluggish when again brought into service, and a battery that is only partly used shows the same characteristics, though of course in a much lesser degree.

While the continual or frequent abuse of a battery is destructive, it is a comforting fact that an occasional excessive discharge, or an occasional abnormal draft or even a frequent discharge rate that is a trifle above the normal does no appreciable harm, and it is this quality of ability to stand a certain amount of overwork that gives the storage battery much of its value.

EMERGENCY WAGON DEVELOPED BY KNOX TO RENDER "FIRST AID" TO INJURED



SPECIAL KNOX EMERGENCY WAGON SHOWING METHOD OF TOWING BADLY DISABLED TOURING CAR

Under ordinary circumstances manufacturers of automobiles bend all their energies toward keeping cars on the road; there is little they will not do to accomplish this end. There are occasions, however, when it is necessary to go to the opposite extreme and get machines off the road on the double-quick—when, for instance, there is a smash-up and the car is left in a condition of helplessness.

Most automobile concerns of any importance have rescue cars used for such emergency work, and though they fulfil their destinies more or less satisfactorily, there are few that are as well adapted to their special class of service as the emergency car recently designed by the Knox Automobile Co., which is shown in the accompanying illustration. It is merely as a matter of course that the car is equipped with spare parts, tools, jacks, block-and-tackle and other conventional aids for incapacitated automobiles; but the special apparatus for handling cars unable to navigate on their own wheels is distinctly an advance on more familiar methods, such as skids, small trucks, and so on. An adjustable bracket, attached to the rear end of the emergency car serves as a support for the front end of the disabled machine, which can be moved out of sight and into the proper kind of a haven in short order and with little difficulty.

It's Here—the Chamber of Experts.

By way of carrying to further conclusions testing work that heretofore has been done only by the Royal Automobile Club, the "London Chamber of Motor Experts" has been formed in England, and its expressed purpose is to examine patents, make technical tests of anything and everything pertaining to automobiles and to issue forthwith certificates of merit or render judgment—for a consideration, of course. According to present plans, the Chamber, which consists of a number of men prominent in the trade who frankly admit they are experts, will sit weekly to consider such devices or matters as may be brought before it; furthermore, in the case of a device or a patent that appears meritorious, the Chamber will lend its assistance and influence in obtaining capital to exploit it. The Chamber thus will occupy a slightly different position from that occupied by the R. A. C. and the Automobile Club of America, both of which make tests and publish the results thereof but make no recommendations for or against the devices.

Easy Method of Inserting Valve Spring.

One good way to insert a refractory valve spring is to compress it in a vise and tie it with twine. After it is in place and the cotter key has been inserted, it is a simple matter to snip the string.

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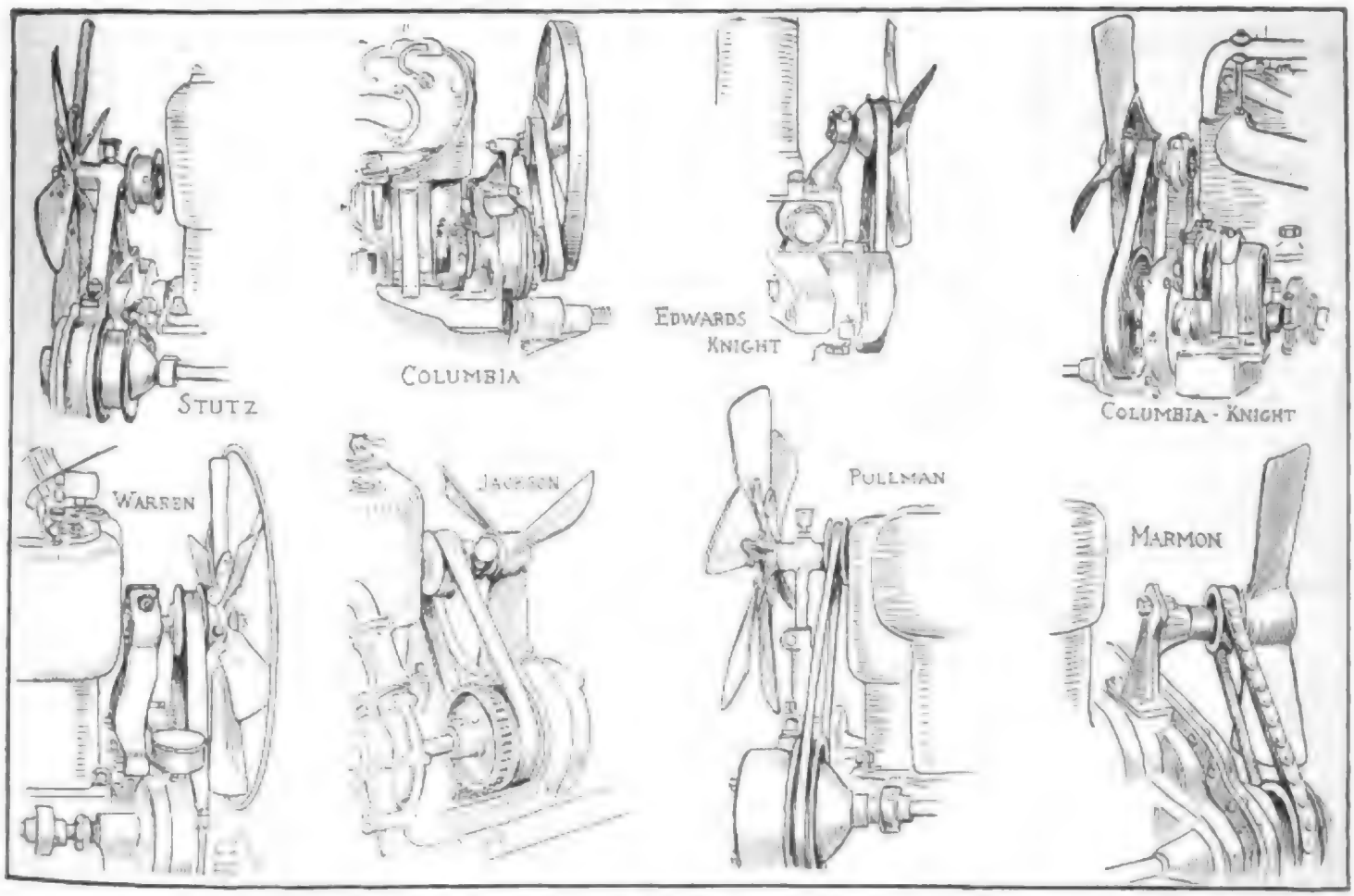
FACTORS THAT AFFECT FAN MOUNTING METHODS

Effect of Oil and Water on the Driving Belt and the Necessity for Providing Means of Adjustment—Popularity of V-section Belt and Accessibility Both Increasing—Why Substantial Supports Are Needed.

To fan or not to fan is not the question, for it has been demonstrated that if the cooling water of an automobile engine is to be prevented from boiling over and humiliating the owner whose car is likely to be somewhat scornfully apostrophied "Steamer" as a result, to say nothing of possible harmful effects on the engine, some means of providing a draft through the air tubes of the radiator must be provided. Granted, therefore, that some sort of a fan is necessary, the problem becomes one of driving it—of keeping it eternally at its work, as long as the engine is "turning over," despite the discouraging effect of oil and grease and water.

In this respect, be it added for the elucidation of those whose knowledge of fans is limited to acquaintance with the palm-leaf variety, or the whirring electric that stands on top of a desk and induces an artificial ocean breeze, the automobile fan sucks the air in through the tubes of the radiator, and does not, as is sometimes supposed, push it out the other way. It draws in fresh, cool air, which is not so cool by the time it reaches the engine, which merely proves that the fan serves its purpose in causing the heat in the water in the radiator to be absorbed by the air and dissipated.

Theoretically, the fan ought to draw in nothing but pure, clean air, but it is not the least bit discriminating and is a great deal more persuasive than the proverbial spider in inviting the nomadic house fly and horse fly and everything else that flys to come inside where it is warm. In fact, its influence on the small winged species is irresistible; no fly that ever heard the invitation has been known to send regrets. Also, the fan draws in dust and dirt and pumps it all over the engine and particularly into the carburetter intake, and though this trait of the fan is a little bit outside the province of the present article, it nevertheless indicates a fairly common hope that some day some one will devise a fan or a method of mounting a fan that will be a little more discriminate in the disposition of the flies and dust and things it draws in, even if it cannot be prevented from drawing them in altogether. One foreign manufacturer has evolved a fan and radiator of the type that is said to be all that can be desired, and even if the ordinary variety of American fan does draw in everything else along with the air and

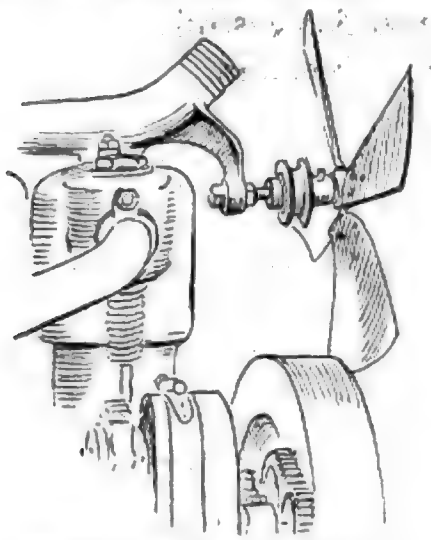


VARIETY DISCLOSED BY A STUDY OF FAN MOUNTING AND DRIVING METHODS

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spread it all over things in general, the draft of air cools the water and the fan induces the draft. Q. E. D.

Among the other things the fan draws in along with the air is water, which on the



MAXWELL MANIFOLD MOUNTING

fan itself, or on the externals of the engine, may have no appreciable effect on efficiency in general, but rain water on the belt that drives the fan is, as one R. Kipling, Esq., puts it, "quite another story." Every one knows that water on the spark plugs and on the magneto does not help to make the engine run better, so it is unnecessary to dilate on the subject.

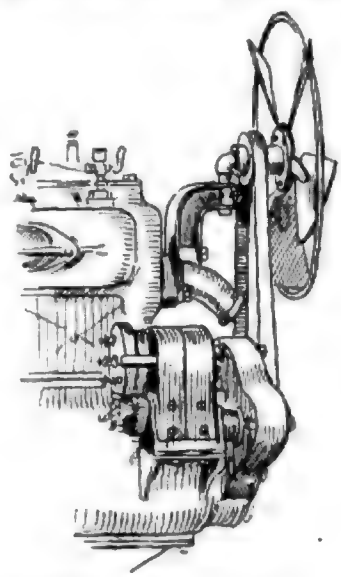
Necessity for Providing Adjustment.

Leaving grease and oil out of the equation for the time being, it is water on the belt that makes the average fan assembly the bete noir of the motorist, to employ a French phrase that means pretty nearly everything that is bad in polite language. If the belt is not exactly tight enough—assuming it to be a flat belt, of course—water will make it slip to a certain extent, and if it is tight enough or is a little bit tighter than it should be, water will make it stretch, which amounts to the same thing. Grease and oil also will make the belt stretch a little bit, though their most potent effect, naturally, is to cause slippage.

In either case, slippage implies some means of taking up the slack, whether that slack is the result of natural wear and stretch or has been super-induced by the presence of water or some oleaginous substance. That there is no visible end to the making of books is fairly well known, and though it may not be so well known that the end of methods of providing fan belt adjustment scarcely is more visible, a glance at the accompanying 14 sketches of as many different methods will help to make that fact plain, for it is very evident that not all the methods in vogue are illustrated. To illustrate and describe all the various modifications of the 14 typical installations here depicted would require a very large-sized tome.

Importance of Solidity in Mountings.

Scarcely less important than the necessity for providing some means of tensioning the fan belt is the method of mounting the whole assembly, for unless the fan is firmly and properly mounted in a substantial manner "all kinds of troubles" are likely to ensue, probably the most disastrous of which are cracked crankcases and punctured radiators. Despite the fact that fans are made as light as it is possble to make them—the weight of the cast aluminum and pressed steel variety, for instance, best can be expressed in ounces—they nevertheless have weight; the weight is augmented by



HERRESHOFF CONSTRUCTION

the speed at which they are driven, and when one of them gets loose—such things have been known to happen—it can cut some wonderful capers.

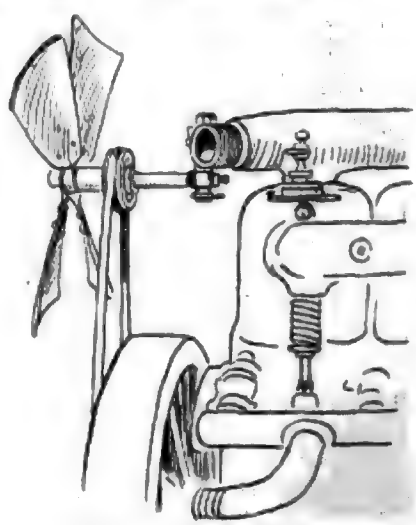
Bent Fan Blades That Ruin Balance.

Another thing—most fans are carefully balanced both statically and running before they are finally mounted for duty on an engine; which is as it should be, for rapidly rotating, unbalanced fans would cause an amount of vibration, despite their lightness, that soon would shake loose their fastenings and let them "run amuck." But no matter how carefully a fan may be balanced before it leaves the factory the accidental bending of one or more of the blades will tend to throw it out of balance and cause it to vibrate to a greater or less extent; this is one reason why most manufacturers choose very solid and substantial mountings, vide the Stutz and Columbia and the Edwards-Knight and the Warren and the Marmon and some of the others illustrated.

Not so very long ago the general practice was to drive the fan with the aid of a belt running over a pulley on the front end of the crankshaft, this construction being probably the simplest to design and manufacture. But belts are likely to break at least once in the course of their natural lives, though this is nothing against them, for any part of a piece of machinery will wear out in time, and as there are few who enjoy "fishing" amongst an accumulation of grease and oil and dirt for the end of a new belt, this practice gradually is giving away to more logical construction in which the belt runs over a pulley on the pump or magneto shaft. Incidentally, it is difficult to maintain a crankshaft front end bearing absolutely oil tight, and as the most natural abiding place of the oil that leaks out is on the fan pulley and belt, this fact has further mitigated against such construction. Where the timing gear train is lubricated with grease conditions are somewhat ameliorated, for it is not so difficult to make grease "stay put" and belts can be made to run fairly clean. On the whole, however, the pump or magneto shaft location of the pulley is preferred as permitting the greatest accessibility.

Advantage of Pump-Shaft Driving Pulleys.

Stutz construction, for instance, follows these general lines. A six-bladed fan is mounted on ball bearings on a solid triangular member securely bolted to the top of the timing gear case. A fairly wide, flat belt is used, and it passes over a flanged pulley mounted directly on the pump shaft, the belt thus coming between the end of the gear case and the rest of the engine.



MAXWELL ADJUSTING METHOD

The method of increasing the tension on the belt is simple and consists merely in providing elongated slots for the bracket-holding bolts instead of the usual round holes. Hence, when it becomes necessary

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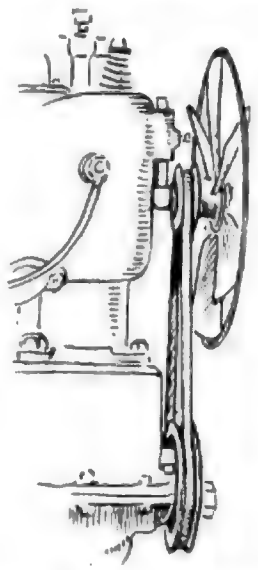
to tighten the belt the operation can be performed quickly and easily by slackening the two nuts that hold the bracket and sliding the whole mechanism bodily a fraction of an inch further from the driving pulley. Needless to add, the latitude of movement of the bracket is not sufficient to permit the fan to be moved so far to one side of the center of the radiator that only part of it is useful; the total movement is not more than one inch at the outside.

Eccentric Spindle Adjustment Preferred.

This method of shifting the whole fan assembly is used by comparatively few manufacturers, the majority preferring the eccentric spindle as leaving, perhaps, slightly less chance of damage by reason of bolts thoughtlessly left untightened after adjustments have been made. In Columbia construction, which together with the Stutz and a number of others is illustrated herewith, the eccentric spindle is mounted on a solid bracket which, in turn, is bolted to the top of the timing gear train. Loosening the end screw in the spindle permits the center of the fan to be moved with relation to the center of the driving pulley, thus providing for the removal of slack. Edwards-Knight practice is somewhat similar, except that the bracket is partly hollow, presumably to reduce weight. In both of these, it may be noticed, the driving pulley is mounted on an extension of the timing gear shaft on the outer side of the gear case, thus making the belt even more accessible than in the previous case. The Columbia-Knight engine also exhibits this feature, the essential difference in the construction being that the fan bracket is formed integral with the front of the timing gear case. Somewhat similar construction also is employed by Jackson engineers, though the driving pulley is directly on the pump shaft, as it is in the Stutz. Both employ the eccentric spindle for adjustment, as does the Warren, though the arrangement of the bracket in the latter is slightly different; instead of being bolted to the top of the timing gear case it is bolted to the inside face, thus permitting the fan to be placed slightly closer to the engine and decreasing overall length.

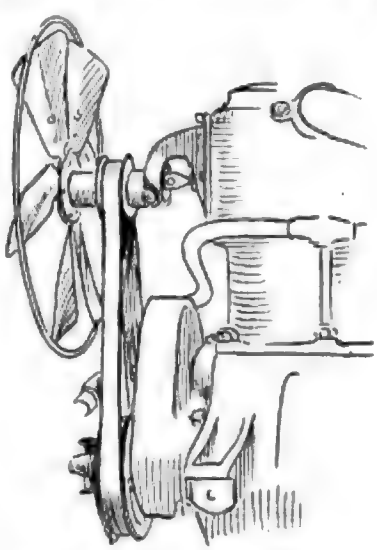
The Influence of Fan Blade Shape.

The shape of the fan blades and their number has very little, if any, influence on the method of mounting the assembly, though obviously both factors bear directly on the efficiency of the fan. Some manufacturers prefer the six-bladed fan, others cast in their lot with the four-bladed fan; one, at least—the Jackson—has a three-bladed fan, and it is significant that the Marmon, which is one of the latest cars to be placed on the market, is cooled with a two-bladed fan of the so-called "aeroplane" type. In this connection it is unnecessary, of course, to point out that a well-designed two-bladed fan operating at



PULLMAN BELT ADJUSTMENT

the proper speed will be more efficient than a poorly designed six-bladed fan which does nothing more than "flap the wind" and may not even do that. As a rule, however, the manufacture of fans is not attempted by the engine builder, for it is realized now more



REO BRACKET ARRANGEMENT

than ever that the designing of a really efficient and quiet fan calls for special knowledge and for facilities that the car builder rarely has at his disposal. Fan specialists are just as important in their way as are carburetter specialists or magneto specialists, and their products can be regarded as just as efficient as the products of other parts specalists.

But to get back to belts and mountings—judging by the increasing use of the V-section belt as revealed at the recent automobile shows, the flat belt has lost some prestige during the past year. A number of manufacturers who pinned their faith to the flat belt last year have "switched over" to the V-belt for the coming season. The principal advantage of the V-belt over the flat belt is that it is less liable to slip when wet or greasy, which fact is made fairly plain by the section of the pulley. The extra strain that would tend to cause the flat belt to slip on the smaller pulley causes the V-belt to wedge itself between the pulley flanges, thus automatically increasing the grip. It is slightly narrower, too, though the decrease in overall length it permits scarcely enters into the argument for its adoption.

Popularity of V-Section Belts Increasing.

The Marmon fan, which is one of the few that has only two blades, is driven by a V-shaped belt, the fan bracket being bolted to the top of the timing gear case. Provision for taking up slack is provided in an eccentric spindle held in place by a small bolt and nut operating in a curved slot in the bracket. The Pullman is another in which a V-section belt is employed, though the method of providing for stretch is quite different, as is revealed by the picture. The bracket is in effect a double bracket, the lower portion being attached to the timing gear case with the upper portion, supporting the fan pulley telescoping into it. A clamping nut on the lower sleeve, which is split, permits the telescoping rod to be shifted up to compensate for stretch.

Probably the simplest of all fan brackets are two that are used on Maxwell models, a round belt running over a driving pulley outside the flywheel on a forward extenson of the crankshaft being used to drive the fan in both cases. In both, the bracket is attached to the water outlet piping at the top of the cylinders; in one, provision for taking up the slack in the belt is made with the aid of an eccentric spindle, and in the other the spindle terminates in a ring which clamps around a vertical rod bolted to the water pipe; a single screw serves to hold the spindle in place.

Necessity for Careful Fan Balancing.

The Herreshoff fan bracket also is mounted on the water piping, though the arrangement is quite different from that employed in Maxwell cars. The bracket is virtually an I-beam section inverted L bolted to the water pipe and carrying a similarly shaped fan spindle. A single clamping screw suffices to hold the spindle in position and permits it to be moved to separate the pulley centers to compensate for stretch in the belt. All three of these locations naturally imply carefully balanced fans, for the effect of continued vibration on the water con-

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nections can be better imagined than stated.

As a rule, manufacturers scout the idea of mounting the fan bracket directly on the cylinders, for a cracked or broken water jacket may be scarcely less serious than a cracked crankcase, and in general there is more metal in the crankcase to sustain the strain than in the cylinder jacket. Still, those manufacturers who have chosen such means of supporting the fan bracket have had no cause for regret by reason of cracked jackets, and some of them have evolved delightfully simple devices.

In the McFarlan arrangement, for instance, the bracket consists of nothing more complicated than an L-shaped spindle, the upper leg of which fits into a socket cast integral with the cylinder. A single set screw serves to hold the spindle and means for liberal adjustment is provided. The one possible objection to the system is that in the event of the set screw loosening itself the bracket, fan and all, would come loose and might damage either itself or the radiator. Obviously, however, such a contingency could be prevented quite easily by the simple expedient of drilling the top of the upright spindle member and inserting a cotter key in the hole. A V-section belt is used on McFarlan engines.

The Reo bracket also attaches directly to the cylinders, and it is distinctive in that it is one of the very few in which the belt is maintained continually tight with the aid of a spring. A joint where the spindle is supported in the bracket permits both ends of the spindle to move vertically; spring pressure on the inside end presses the outer end upward and in this way keeps the belt tight continually. The latitude of movement of the spindle, however, is restricted so that in the event of the belt breaking the fan could not touch the radiator.

Dry Cells for Electric Lights.

Although dry cells seldom are used as a source of energy for electric lights, it should be remembered that when they are used the voltage of each cell is a little more than one and that where six are connected in series to feed six volt tungsten lamps, the filaments are likely to be illuminated too brightly to permit of normal life. Consequently, only five of the cells should be used at first until the lamps show symptoms of dimming, when the sixth should be added.

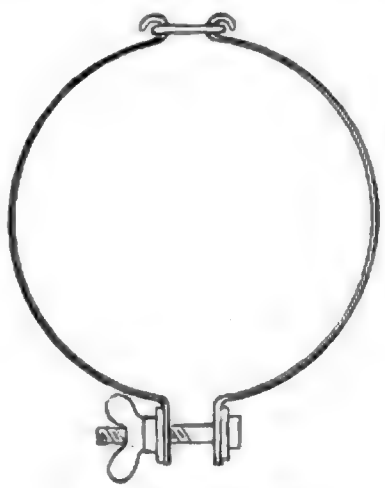
To Keep Set Screws from Loosening.

A very simple method of preventing set screws from working loose consists of filing teeth in the sides of the "cup" at the end of the screw. The teeth all should point one way, so that when the vibration tends to unscrew the threads, the teeth project into the metal and prevent movement.

CLAMP THAT FACILITATES REPLACING THE PISTON

Simply Constructed from Sheet Metal and Shop Scrap, It Serves to Compress Rings—Its Design and Operation Made Plain.

Inserting a piston in a cylinder, or lowering a cylinder over its piston, is not particularly difficult, though a certain amount of care must be taken if pinched fingers and possibly broken piston rings are to be avoided. But when it comes to monobloc motors the difficulties increase and it takes



PISTON RING CLAMP

two men to do the work without special appliances. The accompanying illustration shows a clamp that permits a monobloc motor to be assembled by one man and facilitates the work even if there are two on the job.

Two pieces of sheet metal are formed up each with one edge flanged and the opposite edge turned over to form a tube. A piece of heavy wire is bent, as shown, to form a hinge and locked in any desired way. If something neater than the twist is desired a tight-fitting copper burr may be slipped over each end, the ends being cut off close and slightly riveted over to hold the burrs in position. The burrs must be filed off so that they do not project inside the sheet metal circle; if the wire is merely twisted it must likewise be so bent that there will be no part of it inside the ring.

A small bolt passing through the flanges and provided with a wing-nut permits the tightening and loosening of the clamp. Two re-enforcing strips of metal may be soldered or riveted to the outer surfaces of the flanges to add stiffness if the metal is not heavy enough to withstand springing by itself. In order to permit the clamp to be removed from a piston without taking the nut off its bolt, one of the flanges may be slotted so that by slightly springing the other the bolt may be slipped out after the nut has been slacked back a turn or two. Another method of accomplishing the same thing would be to make one of the turnovers for the hinge joint in the form of a hook rather than a tube, so that when the nut was slacked the wire could be slipped out. Either method will answer the purpose.

When the clamp is in position on a piston it should be just long enough to catch all the rings, though it need not cover more than half of the top and bottom rings. By screwing down the wing-nut the rings are closed sufficiently to permit their entering the cylinder, which is lowered over the piston, pushing the clamp down as it goes. Each ring will have entered safely before the clamp is pushed clear. A little oil on the piston, the rings and the clamp will facilitate matters. With two such clamps one man can get the pistons into a monobloc casting with little difficulty.

Like many other simple devices, this clamp can be elaborated considerably by making the hinge joint more "shipshape" and, perhaps, providing a swing bolt in place of the plain bolt on the flange side, and other detail changes will readily suggest themselves. The form described is easily made, however, and will answer the purpose very well.

Simple Substitute for Flexible Shaft.

It sometimes is impossible with an emery wheel mounted on a lathe mandrel or on a regulation grinder, to "get in" to the place which needs the application of the abrasive. At such times a wheel mounted on a flexible shaft would, figuratively speaking, be worth its weight in gold. A very good substitute for a flexible shaft can be very quickly rigged up and comprises nothing more than a rod of Bessemer steel mounting the wheel at one end, the other end being inserted in the lathe chuck or an improvised chuck on the grinder. The flexibility of a long length of this rod is such that a latitude for the movement of the wheel embracing a circle of considerable extent is obtained.

Pencil Marks to Test Valve Grinding.

A good way to ascertain whether the valve grinding operation has been continued to the proper point—that is, so that the valve seats properly all around—is to mark lines upon the valve with a soft lead pencil; lies should be spaced about a quarter of an inch apart and continued all around. Seat the valve and turn it on its seat under some slight pressure. If the valve is properly seated the lines will have been completely removed.

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WIRING OF LIGHTERS AND STARTERS MADE PLAIN

Important Part That Is Played by the "Blood Vessels" of the Electric Lighting and Engine Starting System—One-, Two- and Three-wire Methods Explained—What to do When Trouble Develops.

(This is the twenty-fourth of a series of articles designed to make clear the electric lighting and engine starting systems in use and to render easier their care and repair by the dealer and owner alike.)

If the every-day workaday person would take the trouble to liken some of the parts of his electric lighting and engine starting system to the parts of his own body, much of the fog which surrounds such apparatus would disappear.

Take the wiring, for instance—the thin, cotton-covered, innocent-appearing conductors that stretch from the generator to the battery and from the battery to the lamps and the starting motor. It is much like the system of blood vessels in the human body. A person could no more get along without veins and arteries than a lighting and starting system could get along without wiring; both are absolutely essential in their respective spheres. Just as the arteries carry the life-giving fluid to the innermost and outermost parts of the body, so do the wires carry the "juice" to the lamps and to the starting motor.

Danger That Lies in Short Circuits.

The analogy is particularly appropriate in several respects. Imagine what would happen if an artery were severed accidentally: The person would bleed to death in short order unless the flow of blood was stopped. In the wiring of a car, a short circuit can be likened to a severed artery, for it amounts to the same thing in the end, the only difference being that in one case a human life is lost and in the other the life of a battery is lost. The loss of blood weakens the person unlucky enough to suffer the rupture of an artery. The loss of electricity weakens the battery in the short-circuited line. And if the loss continues long enough in either case the result is bound to be disastrous. Veins and arteries are carefully protected to reduce to the minimum the possibility of damage to them and the same applies to the wiring of a car.

The blood-vessels are more or less hidden beneath the layers of fat and tissue and the wires are encased in waterproof layers of cotton impregnated with paraffin or some other dielectric that is equally efficacious in keeping out moisture and keeping the electricity in.

Electricity is very peculiar stuff; it always will take the shortest and easiest possible path to return to the battery or the generator or whatever the source of origin may be. But it must be provided with some sort of a medium that will permit it to return before it can be put to useful work; it must be made to circulate, so to speak, to perform work. For instance, it leaves one side of the battery and, after traversing a length of wire leading to the various devices that are to perform work and passing through them, it goes right back to the battery by way of the return circuit.

If either the outgoing or the incoming

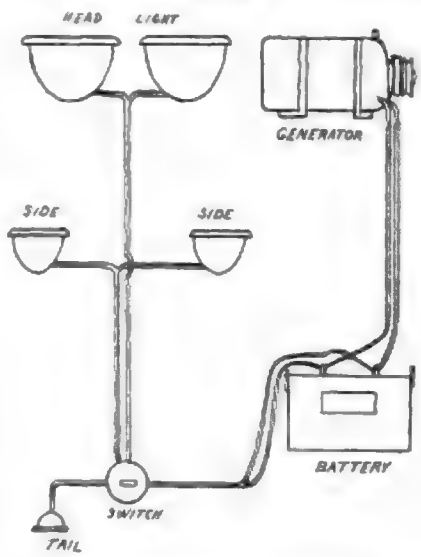


FIG. 1—TWO-WIRE SYSTEM

wire were separated, either through breakage or a switch, the flow of current would cease instantly and it would perform no work. That is what happens when a wire breaks somewhere on the car. The current cannot find it way back to the battery, and so it ceases to flow altogether. That is, it ceases to flow unless the broken end happens to come in contact with some metal part that will provide a return passage for the current, when the battery very promptly will drain itself and if the drain lasts very long it will just naturally die. After a while there will be no energy left in it, and the lamps will not light and you can press the starter button till doomsday without the slightest of sympathetic movements from the starting motor.

Consider, also, what would happen if, after a surgeon had severed both an artery and a vein in the course of an operation, he should inadvertently connect them up wrongly—the artery to the vein and the vein to the artery. It is altogether likely that the patient would be mighty uncomfortable, to say the least. But he would not be uncomfortable very long. In fact, he would cease to complain in about two shakes of the proverbial dead lamb's tail. Pretty nearly the same thing would happen if the wiring on the car were to be connected up wrongly, the positive wire to the negative terminal, for instance, or vice versa. The battery would evidence its discomfort by considerable gassing and heating, if short-circuited by the proceeding, and its "innards" would rise up, or, rather, buckle out sideways, and just naturally play havoc with themselves.

Why Wrong Connections Bring Trouble.

This is one very important thing to which all too little attention is paid by the average owner or operator. No positive wire ever should be attached to a negative wire, as otherwise a short circuit is bound to result, if not immediately, then as soon as the lamps are turned on or an attempt is made to start the motor or the generator takes up its work. There are any number of simple methods of determining the polarity of a circuit if it cannot be determined from the wiring diagram that almost invariably accompanies the installation. Probably the simplest method of all is to stick the two suspected wires (bare, of course) into a raw potato, placing them rather close together. After they have been in place for a few minutes withdraw them and the one that appears blackest will be the positive wire.

Another very simple method is to plunge the two wires into a solution of common table salt and water. Bubbles of gas will collect on the negative wire.

By way of obviating some of the troubles that arise from improperly connected wires, quite a number of manufacturers have adopted the laudable practice of using variously colored insulation to indicate the wires that lead to the various terminals shown in the wiring diagram. Then with the diagram itself printed in colors, or with the colors of the insulation indicated in

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type, it becomes a simple matter to make or to check the installation should it become necessary to remove the wires for any cause. Thus, for instance, a red covered wire leads from the positive terminal of the battery to the positive terminal of the generator and never should be attached to the negative terminal. It is true that there are some generators to which the wires may be connected without reference to their polarity as determined by the battery, but these types of generators are in the minority.

Red always is the color that is used to indicate the positive terminal of either battery or generator when any color at all is used. When no color is used a small plus (+) sign serves the same purpose. The negative side generally is not indicated by any color, the negative terminal of the battery, for instance, being unpainted, in contradistinction to the positive terminal, which generally is red-coated. In lieu of coloring, a small minus (—) sign is used. These are the signs that invariably are used in wiring diagrams. Incidentally, for the elucidation of those who are unfamiliar with such signs as they are written, it may not be irrelevant to add that a series of lines alternately long and short indicates a battery, the number of pairs of lines representing the number of cells; a sequence of lines growing gradually smaller indicates a ground connection; and where one wire crosses another but is not attached or connected to it a small semi-circle at the intersection serves to make that fact plain. All of these signs are shown in the accompanying diagrams, which represent typical layouts as arranged by several manufacturers of electric lighting and engine starting apparatus.

Three Wiring Systems Made Plain.

Generally speaking, there are three wiring methods in vogue: the one-wire system, which is the simplest of all and in which the return is made through the frame of the car; the two-wire system, in which the return is made by wire; and the three-wire system, which is used where the battery is split into two sections, power being drawn from both for the starter, with the lighting load distributed half on each section.

Obviously, where it is desired to employ a 12-volt battery for starting and 6-volt bulbs, the three-wire system is the only one that can be used. Of the other two the one-wire, or grounded return, system has the advantage of simplicity as far as the actual wiring is concerned, though much controversy has waged over its other advantages as compared with the two-wire system. The question has come in for no little discussion by the Electric Lighting Division of the Society of Automobile Engineers, and though no action recommending the adoption of either system as the better has as yet been made, a statement, as follows, has been issued giving the committeemen's opinion anent the advantages and disadvantages of both systems:

Advantages of the grounded return: First—It makes possible a bigger contact point and better insulation in the lamp receptacle. (The Ediswan base has been recommended for adoption as the standard base). Second—This makes possible fewer connections at the lighting switch, so that when five lamps, a speedometer light and a horn are used there will be only 11 connections as against 14 in the two-wire system.

Wherein the Copper Return Scores.

Advantages of the two-wire system: First—As the side lights, speedometer and horn usually are carried on the body, special provisions must be made for mounting the "return" of these on the one-wire circuit, and current carrying by special grounds is doubtful when bodies are changed and the grounds removed and put back again. Second—If the magneto only, or the battery only is used for ignition, so that there is no ground due to the ignition primary circuit, the two-wire system makes a short circuit impossible if one ground occurs, and if two grounds occur they must be on opposite sides of the line to form a short circuit. Third—If the head lamps become loose on the brackets the circuit will not be affected, as in the case with the grounded return, where the contact between the lamp and the bracket makes the circuit. Fourth—With grounded return the cleanliness of the metal frame where the engine is bolted to the frame in case the ground is made to the engine, is essential and rather problematical. If copper return is used, this factor is of no importance.

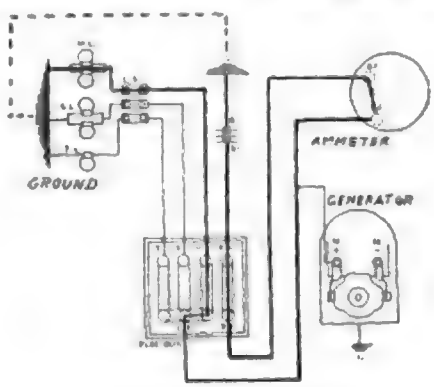


FIG. 2—GROUNDED RETURN

Obviously, there are many slight variations of all three of the types of wiring systems, as when ignition is added, for instance, and made a function of the lighting and starting system. But if all such adjuncts are left off and the diagram presented in a clear form as it applies to either lighting alone or to lighting and starting, it becomes fairly simple, and the average person should have little difficulty in tracing out the various circuits.

The plain lighting system, including only the generator, the battery and the lamps (and the necessary switches and cut-out, of course) is the simplest and it may be wired for either one or two wires, according to the designer's fancy. Figs. 1 and 2 show, respectively, the one- and two-wire systems as applied to the simple lighting system, and in neither of them is it difficult to trace the circuits.

Tracing Out the Current Path.

Commencing at the battery in Fig. 1—the battery is unmarked as to polarity for the sufficient reason that the generator is of the type that may be connected either way and will operate with equal efficiency—two wires lead directly to the generator. It is to be assumed, of course, that between the battery and the generator there is interposed an automatic circuit breaker to protect the battery when the engine is idle, for all such systems require a device of the kind. From one of the battery terminals, a wire leads to one side of each of the lamps. A wire from the other terminal of the battery leads to a central point on the switch, and from each of the individual points on the switch wires lead to the other sides of the lamps. Hence, as one battery wire leads directly to each lamp and the other to the central point on the switch, connecting the central point of the switch to any of the other individual contacts affords a passage for the current. In this case, the wires leading from the individual lamps and the one wire from the central point in the switch represent the return.

The arrangement depicted in Fig. 2 is even simpler and requires considerably less wire. In this case, both the battery and the generator negative terminals are simply grounded to the car frame, as are the wires from one side of each of the lamps. The positive terminal of the generator is connected to the other sides of all the lamps, through an ammeter, and also to the positive terminal of the battery. Each of the lamp circuits is protected with a fuse and each has its individual switch as a matter of course. Supposing, for instance, that the switch controlling the head lamps were closed, the path of the current then would be as follows, as is indicated by the heavier lines in the drawing: Starting from the positive side of the battery, it finds its way through the fuse to the ammeter, which registers the amount of current drawn, and through the meter to and through the line fuse, the head lamp switch and the head

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lamps to the ground connection. As the negative side of the battery is grounded, the complete circuit thus is established. With very little effort the path of the current in any of the diagrams can be traced in a similar manner, the only requisite being patience and a knowledge of the fact that there must always be a complete circuit—that the current must always return to the battery, or to the generator, as the case may be.

The wiring diagram shown in Fig. 3 is a little more complicated than the other two, which is logical for the reason that it represents the connections necessary for a combined lighting and engine starting system in which the battery is split into two units to be charged in series and discharged in multiple. The complications added by the starting motor practically are nil, as they represent only two wires and a switch and the wires lead directly to the motor through the switch. In a system of this kind, the battery, which consists of six cells giving a nominal voltage of 12 is connected in multiple series, which is to say, it is divided into two sets of three cells each, connected in series with the two series sets afterward connected in multiple. Thus, for starting purposes, 12 volts can be drawn and for lighting it is a simple matter to proportion the load half on one set of three cells and half on the other set of three.

What To Do When Lights Go Out.

Thanks to the excellent quality of insulating material that now is available and generally is used, the care of the wiring system of a car, regardless of whether it is complex or simple, is a very small matter to worry about. Where installations are factory made, which is the case with the majority of them, it may be taken for granted that they are properly made and with reasonable care they will not develop trouble during the life of the car. Wherever possible, wires are encased in circular loom and to the uninitiated this fact may prove slightly misleading unless it is remembered that there may be several wires in the casing that appears only large enough for one. Also, the wires generally are laid out in lines that are as straight as possible in order to facilitate tracing trouble.

When the lights suddenly go out, the proper proceeding is first to examine the fuses, if any are used. If one of them is blown out that fact may be taken as an indication that there is a short-circuit somewhere in the line and a new fuse should not be inserted until the short circuit has been located and remedied. It may be due to body movement which has chafed the insulation from one of the wires and permitted it to come in contact with the body or one of the wires may have come loose from its connection in the switch and dropped down against one of the other connections. If the fuses are intact, indicating that there is no short circuit, it is time to examine the connections at the battery and at the switch. Sometimes vibration jars the holding screws loose. If all these connections appear perfectly tight, nothing remains but to go over the wiring and search out the break, for every other possible source of trouble has been eliminated.

In cases where the lights merely grow dim the proceeding will vary slightly, the first point of attack being the battery. If

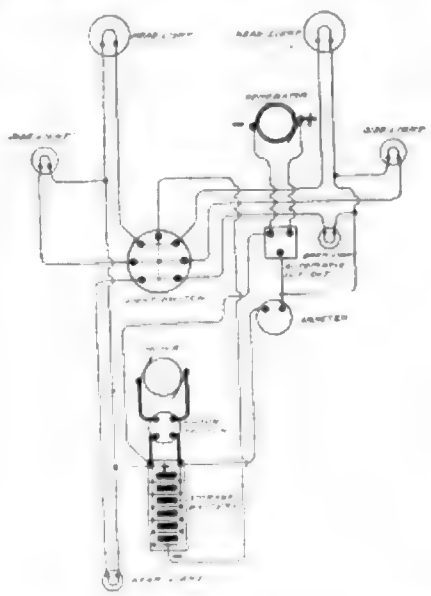


FIG. 3—THREE-WIRE CIRCUIT

the dimness is sudden it may indicate either a partial short-circuit somewhere in the line or only loose connections, either of which can be remedied quite easily. If the dimness is of the progressive type and becomes gradually worse, there may be nothing more serious the matter than a shortage of fluid in the battery or derangement of the charging function. Either condition will be indicated by a battery test with a voltmeter. It is a simple matter, of course, to fill the battery up with distilled water if the fluid appears lower than it should be and the care of the generator already has been made plain in the twenty-three preceding articles that have appeared in Motor World. Constant flickering of the lights—now high, now low and sometimes out—is a pretty certain indication of loose connections somewhere in the line and not infrequently the troubles lie in the lamps themselves which have shaken loose in their sockets.

In any case of trouble with the wiring, nothing will prove of greater avail than will system coupled with a thoughtful diagnosis. One thing at a time should be examined and before some other part is tackled the first should be put back in its original condition; otherwise the work may have to be done all over again. Where broken wires are found, no reliance should be placed on merely twisting them together and binding the joint with adhesive tape. If permanence is to be expected, the joint must be soldered. One very good way of tackling the job is to twist the wires together (after they have been carefully scraped bright) and heat them with a small blow torch, afterward applying wire solder till all the interstices are filled up. Needless to add, the joint must be taped or there is danger that the bare part will come in contact with the frame and cause a short circuit. When making such joints, care must be taken not to draw the wires too tightly or they may break again; the better way is to splice in a piece of wire, thus leaving slight slackness to allow for body movement.

Ammeter as a Tail Light Telltale.

With a straight storage battery electric lighting system, the dash-positioned ammeter serves as an efficient telltale to indicate whether or no the tail lamp is burning. The current consumption should be noted when the lamps are functioning properly, and thereafter the extinguishment of the tail light will be indicated by the lowering of the consumption by an appreciable amount. With the generator system, unless very close regulation is a characteristic of the system, the varying potential of the dynamo prevents the use of the ammeter for such purposes.

Using Hard Steel for Burnishing.

A fairly good burnisher for brass, copper or other soft metal can be made of a file or a piece of tool steel rod, hardened to the limit, with the end ground round and smooth and polished. The polishing must be as nearly perfect as possible, and there must be no scratches whatever. Held against a revolving piece in the lathe, or rubbed, with some little pressure, on a flat surface, the burnisher produces a hard, polished surface that is more durable and tarnishes less rapidly than a surface that is polished by abrasives.

Where Camel's Hair Belts Are Necessary.

In tanneries and in mills where steam and acid fumes abound, the life of a leather belt is short indeed, so that in most such establishments braided camel's hair belts are used. In instances these belts have been known to function properly for a period considerably longer than ten years under conditions which would render a leather belt useless in as many weeks. Possibly a camel's hair belt in place of the orthodox leather fan belt would prove more efficient.

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1,028,532. Gear-Shifting Mechanism. Jos. K. Boland, New Orleans, La. Filed Dec. 4, 1911. Serial No. 663,729. (Design of the selecting device.) 4 claims.

1,028,536. Switch for Jump-Spark Ignition Systems. Evan D. Bright, Philadelphia, Pa., assigner to The Connecticut Telephone & Electric Co., Inc., Meriden, Conn., a corporation of Connecticut. Filed Nov. 11, 1907. Serial No. 401,570. (Means for rendering operative either battery system or magneto system or both systems together and eliminating both.) 2 claims.

1,028,551. Gearing. Joseph Dain, Ottumwa, Iowa. Filed May 22, 1909. Serial No. 497,645. (Friction gearing.) 40 claims.

1,028,615. Two-stroke Cycle Combustion-Engine. Karl Schwarz, Nuremberg, Germany. Filed Jan. 21, 1911. Serial No. 603,822. (Cylinder end tapered to fit into conical receptacle in the cylinder head.) 4 claims.

1,028,624. Automobile-Starter. Wilbert B. Speice, Payne, Ohio. Filed Sept. 13, 1911. Serial No. 649,040. (Spring starter.) 4 claims.

1,028,628.—Tire-Inflating Apparatus. Mason F. Stolberg, Toledo, Ohio. Filed Aug. 24, 1911. Serial No. 645,892. (Friction driven air pump.) 1 claim.

1,028,686. Starting Device for Motor-Vehicles and the Like. Mario Demonte, Gorizia, Austria-Hungary. Filed May 26, 1911. Serial No. 629,601. (Means for releasing the starting handle in case of backfire.) 4 claims.

1,028,713. Carburetter for Internal-Combustion Motors. Wassily Grinewezki, Moscow, Russia. Original application filed Jan. 28, 1907, Serial No. 354,575. Divided and this application filed July 6, 1910. Serial No. 570,539. (Pump operated by the compression of the motor sprays the fuel into the entering air.) 21 claims.

1,028,721. Illuminator. Thomas Clarence Heisey and Andrew J. Sanford, Newark, Ohio, assignors to A. H. Heisey & Co., Inc., Newark, Ohio, a corporation of West Virginia. Filed Aug. 16, 1910. Serial No. 577,416. (Prismatic reflector for headlight.) 5 claims.

1,028,723. Carburetter. Hugo Hezinger, Baldwin, and Carl Hezinger, New York, N. Y. Filed May 17, 1911. Serial No. 627,826. (Means for controlling fuel supply to the mixing chamber by the opening of the air valve to the elimination of check valve and float.) 1 claim

1,028,740. Cushioning Device for Vehicles. Theodore A. Klenke, New York, N. Y., assignor to Klenke Cushion Axle Co., a corporation of New York. Filed Nov. 27, 1906. Serial No. 345,389. (Flexible air bottles between axles and car frame.) 33 claims.

1,028,819. Automobile Sleigh Attachment. Bowditch Place Frazee, Bath, Me. Filed July 15, 1911. Serial No. 638,654. (Runners attaching to the axles, traction being obtained by means of a chain-driven star wheel.) 1 claim.

1,028,843. Cleaning Device for Wind-Shields. Ewing B. Rhodes, Pittsburgh, Pa. Filed Feb. 9, 1912. Serial No. 676,662. (Squegee mounted so as to slide along the glass.) 4 claims.

1,028,847. Exhaust-Muffler. Augustus G. Snyder, Utica, N. Y. Filed Oct. 16, 1911. Serial No. 654,925. (Two chambers, the first provided with numerous transverse baffle plates and the second with a single inclined perforated plate.) 3 claims.

1,028,854. Vehicle Signal. Edward J. Best and Charles M. Fitch, Chicago, Ill. Filed Dec. 27, 1910. Serial No. 599,318. (Electric rear signal for telling operator's intended movements.) 1 claim.

1,028,866. Turning Device for Vehicles. John M. Eadie, New York, N. Y., assignor to Eadie Vehicle Gear Company, a Corporation of New Jersey. Filed Aug. 6, 1908. Serial No. 447,205. (Both front and rear axles provided with central pivots and so linked together that they turn in opposite directions.) 20 claims.

1,028,876. Transmission Gearing for Motor Vehicles. Robert Gaston Hardgrave and Charles T. Adair, Tucumcari, N. Mex. Filed Dec. 3, 1910. Serial No. 595,525. (Main driving bevel gear provided with several series of teeth which mesh with the driving pinion on the end of the propeller shaft.) 5 claims.

1,028,889. Spring Cushion Tire for Vehicle Wheels. Arthur J. Layhon, Lowell, Mass. Filed Jan. 3, 1911. Serial No. 600,564. (Springs interposed between non-yieldable rim and felloe.) 3 claims.

1,028,980. Electrical Signaling Device. Theodore Weiss and Theodore A. Walther, Chicago, Ill.; said Walther assignor to said Weiss. Filed Oct. 21, 1911. Serial No. 656,060. (Motor drives shoe which is caused to vibrate against the diaphragm by means of a stationary crown wheel.) 4 claims.

1,029,018. Transmission and Control System. Henry M. Kinney, Winona, Minn., assignor to Winona Wagon Company, Winona, Minn., a Corporation. Filed Sept. 22, 1911. Serial No. 650,750. (Modified planetary gearset.) 9 claims.

1,029,027. Pneumatic Tire Protector. Albert H. Rawitzer, Omaha, Neb. Filed Nov. 9, 1911. Serial No. 659,313. (Flexible internal armor.) 2 claims.

1,029,063. Motor Vehicle. Russell Huff, Detroit, Mich., assignor to Packard Motor Car Company, Detroit, Mich., a Corporation of Michigan. Filed Oct. 28, 1910. Serial No. 589,544. (Tail light and license bracket mounted on rear mudguards.) 2 claims.

1,029,109. Transmission Gearing. Aaron F. Dickey, Somerset, Pa. Filed July 3, 1911. Serial No. 636,802. (Selective type with the gears always in mesh.) 3 claims.

1,029,111. Carburetter Adjusting Device. Harry S. Echternach, Strasburg, Pa., assignor to Virgil A. Meck, Strasburg, Pa. Filed May 15, 1911. Serial No. 627,293. (Pair of gauges for indicating the maximum explosive pressure under varying carburetter conditions.) 4 claims.

1,029,147. Friction Clutch. George W. Shaffer, Buffalo, N. Y. Filed Jan. 23, 1911. Serial No. 604,110. (Expanding ring clutch.) 4 claims.

1,029,177. Spring Wheel. William T. Dulany, Jr., Arlington, N. J. Filed June 29, 1911. Serial No. 636,077. (Spokes formed of leaf springs.) 2 claims.

1,029,192. Four Phase Single Piston Valveless Motor. Charles Edouard Henriod, Neuilly-sur-Seine, France, assignor to Societe Ribeyrolles & Cie., Puteaux, Seine, France. Filed Nov. 23, 1909. Serial No. 529,585. (Four-cycle motor with rotary distributer valve and ports through piston.) 2 claims.

1,029,215. Tire Protector or Shield. Arthur H. Morton, Cleveland, Ohio. Filed Dec. 11, 1911. Serial No. 664,914. (Wire mesh protective shield.) 1 claim.

1,029,252. Shock Absorber. Owen B. Ames, Brewster, N. Y. Filed Nov. 20, 1911. Serial No. 661,302. (Small leaf springs oppose movement of weight-bearing springs.) 2 claims.

1,029,263. Vehicle Tire. Eugene H. Bingham and Theodor Tominski, San Francisco, Cal. Filed Oct. 12, 1910. Serial No. 586,737. (Tire casing made of spring metal strips and enclosing a pneumatic tube.) 3 claims.

1, 029,290. Starting Device. Henry Henken, Savannah, Ga. Filed Jan. 16, 1911. Serial No. 603,035. (Clutch that releases starter handle in case of backfire.) 4 claims.

1,029,299. Spring Wheel. William H. Howsley, Jr., Adams, Tenn. Filed Feb. 19, 1912. Serial No. 678,523. (Helical springs interposed between the hub and the ring that supports inner ends of the spokes.) 2 claims.

1,029,301. Combined Lifting Jack and Brake Mechanism for Automobiles. Alex Kertesz, Newark, N. J. Filed Jan. 10, 1912. Serial No. 670,487. (Legs attaching to the axle and lowered by means of lever.) 1 claim.

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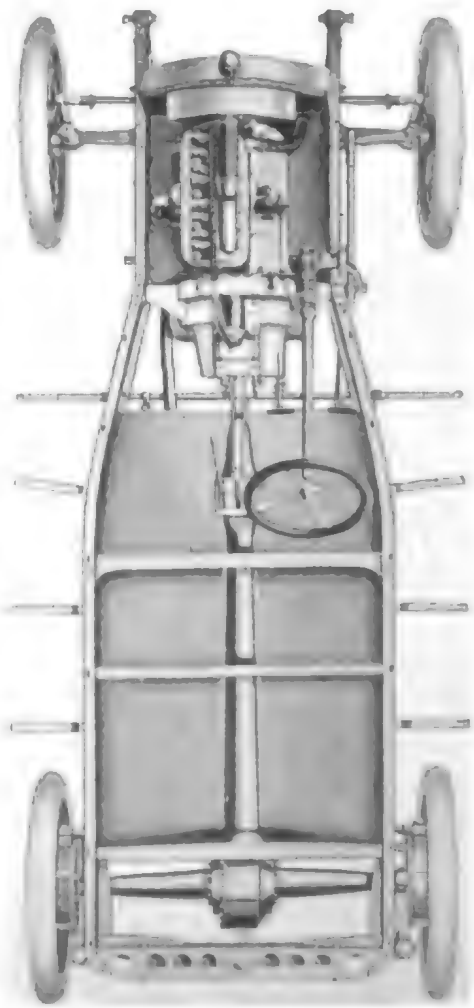
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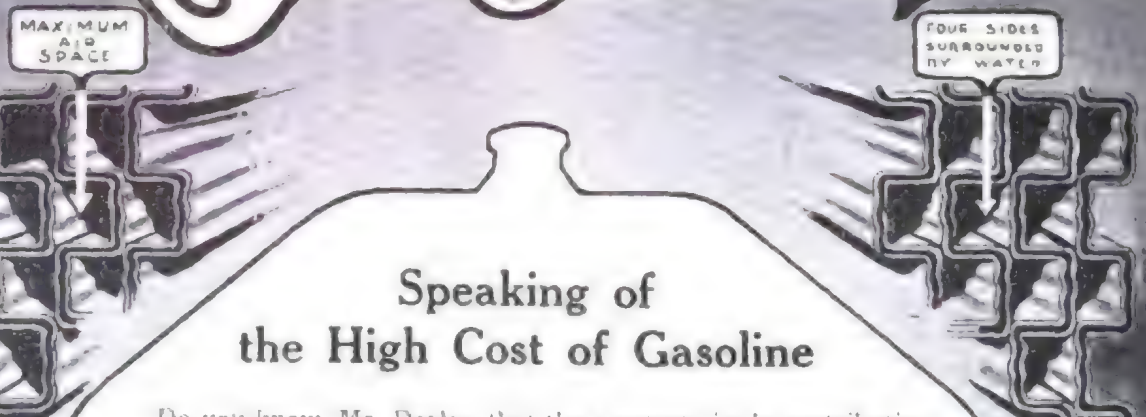
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"32" Six Passenger Touring Car, fully equipped,	$1200 f. o. b. Detroit
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O. Armleder Co. ..... Cincinnati, Ohio
Auburn Automobile Co. ..... Auburn, Ind.
Bartholomew Co. ..... Peoria, Ill.
Buckeye Mfg. Co. ..... Anderson, Ind.
Canadian Standard Auto & Tract. Co. ..... Ft. Wayne, Ind.
Cartercar Co. ..... Pontiac, Mich.
J. I. Case T. M. Co. Motor Works ..... Racine Jct., Wis.
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F. Coleman Carriage & Harness Co. ..... Ilion, N. Y.
Columbus Buggy Co. ..... Columbus, Ohio
Commerce Motor Truck Co. ..... Detroit, Mich.
Corbitt Automobile Co. ..... Henderson, N. C.
Crawford Automobile Co. ..... Hagerstown, Md.
Crescent Motor Co. ..... Cincinnati, Ohio
Crow Motor Car Co. ..... Elkhart, Ind.
Jas. Cunningham Son & Co. ..... Rochester, N. Y.
Cutting Motor Car Co. ..... Jackson, Mich.
Croxton Motor Car Co. ..... Washington, Pa.
Geo. W. Davis Carriage Co. ..... Richmond, Ind.
Enger Motor Car Co. ..... Cincinnati, Ohio
Elkhart Carriage & Harness Co. ..... Elkhart, Ind.
F. I. A. T. Company ..... Poughkeepsie, N. Y.
Flanders Motor Co. ..... Detroit, Mich.
H. H. Franklin Mfg. Co. ..... Syracuse, N. Y.
Gramm-Bernstein Co. ..... Lima, Ohio
Gramm Motor Truck Co. ..... Lima, Ohio
Gramm Motor Truck Co. ..... Walkerville, Ont.
Great Western Automobile Co. ..... Peru, Ind.
Haberer & Co. ..... Cincinnati, Ohio
Havers Motor Car Co. ..... Port Huron, Mich.
Haynes Automobile Co. ..... Kokomo, Ind.
Henderson Motor Car Co. ..... Indianapolis, Ind.
Herreshoff Motor Co. ..... Detroit, Mich.
Ideal Motor Car Co. ..... Indianapolis, Ind.
Imperial Automobile Co. ..... Jackson, Mich.
Jackson Motor Car Co. ..... Jackson, Mich.
Kelly-Springfield Motor Truck Co. ..... Springfield, Ohio
King Motor Car Co. ..... Detroit, Mich.
Kline Motor Car Co. ..... Richmond, Va.
Knox Automobile Co. ..... Springfield, Mass.
Lenox Motor Car Co. ..... Boston, Mass.
Lexington Motor Car Co. ..... Connersville, Ind.
Locomobile Company of America ..... Bridgeport, Conn.
Lozier Motor Car Co. ..... Detroit, Mich.
W. H. McIntyre Co. ..... Auburn, Ind.
McLaughlin Motor Car Co. ..... Oshawa, Ont.
Marathon Motor Co. ..... Nashville, Tenn.
Marion Motor Car Co. ..... Indianapolis, Ind.
Martindale & Millikan ..... Franklin, Ind.
Maxwell Motor Car Co. ..... Detroit, Mich.
Mercer Automobile Co. ..... Trenton, N. J.
Metzger Motor Car Co. ..... Detroit, Mich.
Michigan Buggy Co. ..... Kalamazoo, Mich.
Midland Motor Car Co. ..... Moline, Ill.
Moline Automobile Co. ..... East Moline, Ill.
Moon Motor Car Co. ..... St. Louis, Mo.
Motor Car Mfg. Co. ..... Indianapolis, Ind.
Nance Motor Car Co. ..... Philadelphia, Pa.
National Motor Vehicle Co. ..... Indianapolis, Ind.
Nordyke & Marmon Co. ..... Indianapolis, Ind.
Norwalk Motor Car Co. ..... Martinsburg, W. Va.
Nova Scotia Carriage Co. ..... Kentville, N. S.
Packard Motor Car Co. ..... Detroit, Mich.
Paige-Detroit Motor Car Co. ..... Detroit, Mich.
Palmer & Singer Mfg. Co. ..... Long Island City, N. Y.
Paterson Wagon Works ..... Flint, Mich.
Peerless Motor Car Co. ..... Cleveland, Ohio
Pilot Motor Car Co. ..... Richmond, Ind.
Pope Mfg. Co. ..... Hartford, Conn.
Premier Motor Car Co. ..... Indianapolis, Ind.
Pullman Motor Car Co. ..... York, Pa.
Regal Motor Car Co. ..... Detroit, Mich.
Reo Motor Car Co. ..... Lansing, Mich.
Reo Motor Car Co. of Canada ..... St. Catharines, Ont.
Russell Motor Car Co. ..... W. Toronto, Ont.
Schacht Motor Car Co. ..... Cincinnati, Ohio
Seagrave Co. ..... Columbus, Ohio
Selden Motor Car Co. ..... Rochester, N. Y.
Simplex Automobile Co. ..... New Brunswick, N. J.
A. O. Smith Co. ..... Milwaukee, Wis.
Spaulding Mfg. Co. ..... Grinnell, Ia.
Speedwell Motor Car Co. ..... Dayton, Ohio
Stanley Motor Car Co. ..... Newton, Mass.
F. B. Stearns Co. ..... Cleveland, Ohio
Stevens-Duryea Co. ..... Chicopee Falls, Mass.
Stoddard-Dayton Co. (Maxwell) ..... Dayton, Ohio
Studebaker Corporation ..... Detroit, Mich.
Touraine Motor Car Co. ..... Philadelphia, Pa.
The Tudhope Motor Car Co. ..... Orillia, Can.
Velie Motor Vehicle Co. ..... Moline, Ill.
Warren Motor Car Co. ..... Detroit, Mich.
Wayne Works ..... Richmond, Ind.
Webb Co. ..... Allentown, Pa.
Westcott Motor Car Co. ..... Richmond, Ind.
White Company ..... Cleveland, Ohio
Wichita Falls Motor Co. ..... Wichita Falls, Tex.
Winton Motor Car Co. ..... Cleveland, Ohio
Zimmerman Mfg. Co. ..... Auburn, Ind.

Need We Say More?

WILLARD STORAGE BATTERY CO., Cleveland, Ohio

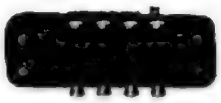
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THE NORTH EAST ELECTRIC SYSTEM

A unit auxiliary electric power plant which can positively be depended upon at all times to furnish current.

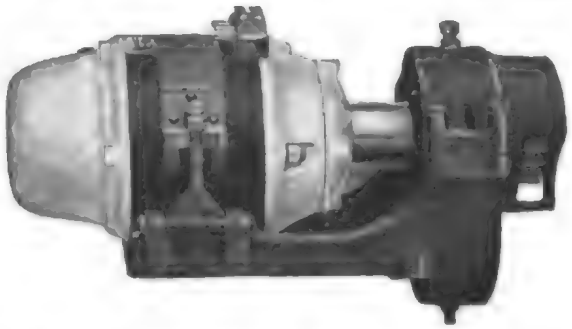
FOR STARTING AND LIGHTING

Positive, Automatic, Safe, Reliable, Serviceable and Mechanically Perfect



The North East Lock Switch

Positively locks the different circuits on or off as desired





The North East Starting Switch

Free from complicated contactors and contact troubles

The North East System is not an afterthought, designed in a hurry to meet the sudden demand. As pioneers in the field of electric cranking and lighting, we have been working for years to produce the most modern and most complete equipment. Here it is—proved best by the test of four years' continuous service and more than 60,000 miles of running without perceptible wear on either brushes or bearings.

No Other System Approaches It in Simplicity

It is a unit system motor-generator with only one moving part—the armature—and is automatically changed from motor to generator by the starting of the engine, thus combining in a single machine the functions of two separate and distinct machines for starting and lighting.

Has the Highest Efficiency—Therefore Most Economical

The battery is charged and discharged in series, a feature recently adopted by other starters that formerly operated on a multiple series system, thus proving the principle of the North East System to have been correct from the start. And although it is the smallest and the lightest electric starter made, it will turn the largest engines used in automobiles with the least amount of current consumption from the battery.

Other Special Features That Distinguish the North East

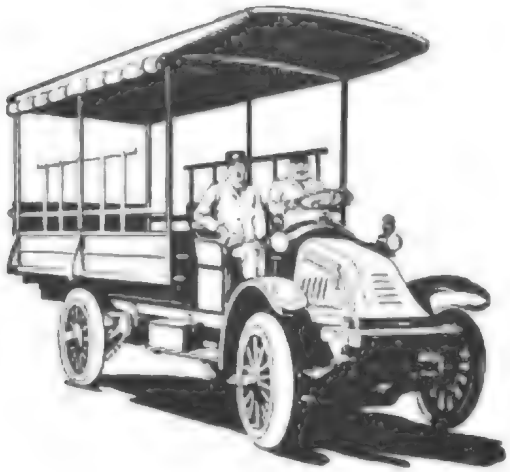
Only one machine—a motor-generator complete in itself; keeps the battery charged at all times, yet never overcharges; built entirely in our factory of the best materials obtainable; positive in operation under all climatic conditions; cannot be damaged or disarranged from the driver's seat; noiseless; equal in mechanical strength, durability and finish to the finest automobile equipment.

The North East Electric System is designed to be an integral part of the engine itself, and cannot be adapted to cars now in use. You can secure the advantages of the North East, however, by specifying that you want it on your new car.

Booklet of further detailed information on request

NORTH EAST ELECTRIC CO.

22 Whitney Street **ROCHESTER, N. Y.**



We Want YOU

We want you to take the agency for Kelly Trucks in your vicinity.

Why not?

Write or wire us immediately.

KELLY
TRUCKS

The
KELLY-SPRINGFIELD MOTOR TRUCK CO.
1033 Burt St., Springfield, Ohio

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Sell the Spark Plugs Which Men Want to Buy

That is the Mezger "Soot-Proof" plug. No man can reasonably doubt it.

Hundreds of thousands of the best-built cars now use more than two millions of these "Soot-Proof" plugs.

And Our Advertising Now Is Telling Legions of Others About Them.

Here is a plug which you can warrant—at our risk—to solve the problems which every user has.

You can warrant it against short-circuit, breakdowns, leakage.



You can warrant that it cleans itself.

And you can prove this fact, if you have occasion, by sooting the plug in a lamp flame. Then, in an engine, three minutes of running will make the plug as clean as new.

C. A. MEZGER, Inc.

Philadelphia, 1427 Vine St.—Petry-Cassidy
Chicago, 1430 Michigan Boulevard—F. E. Sparks
Detroit, Ford Building—H. E. Butcher
Denver, 15th and Curtis Sts.—Hughson & Merton

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We Are One of the Oldest Spark Plug Makers

The "Soot-Proof" plug is the final result of twelve years spent on spark plugs only—spent on solving these problems.

The result is, millions in use—an enormous demand—and a reputation far exceeding that of any other spark plug made.

We are advertising "Soot-Proof" spark plugs in a widespread way.

We are offering to dealers a very attractive discount.

These are the dominant spark plugs—the wanted spark plugs. And every month is adding vastly to their popularity.



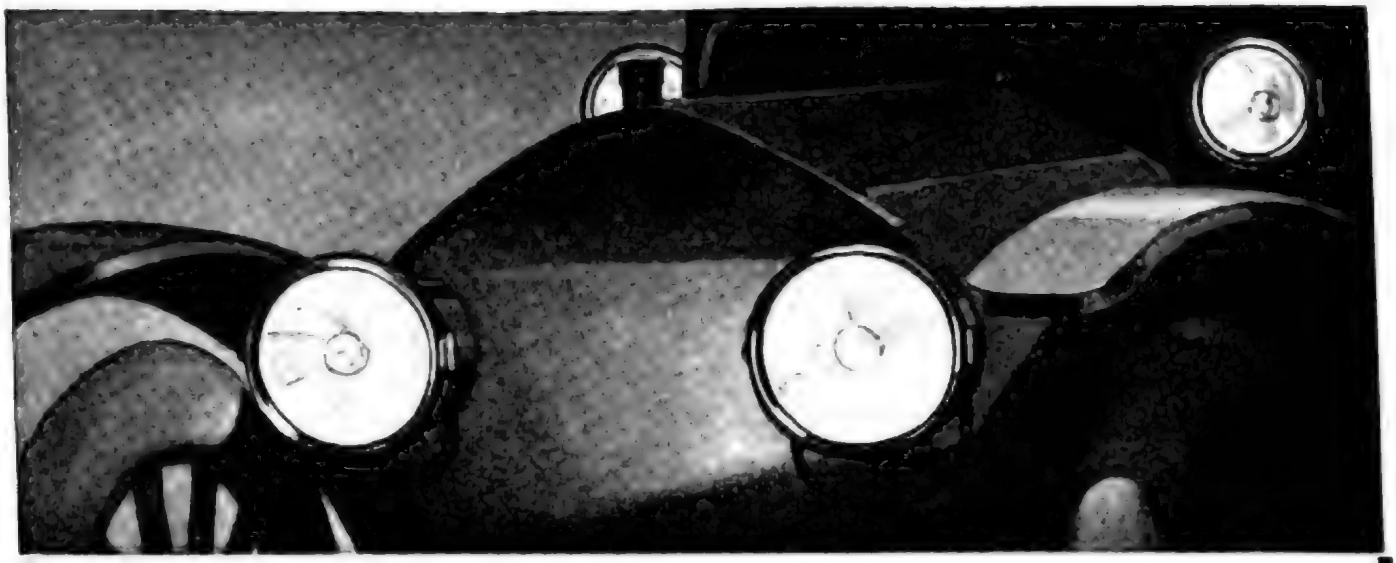
Don't push spark plugs which are far less saleable.

Help us supply this trade.

15 Canal Place, New York

Portland, 329 Ankeny St.—Hughson & Merton
Seattle, 924 E. Pike St.—Hughson & Merton
Los Angeles, 1229 So. Olive St.—Hughson & Merton
San Francisco, 530 Golden Gate Ave.—Hughson & Merton

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Westinghouse
Electric
Ignition, Lighting and Starting

AUTOMOBILE owners have no desire to have experiments tried on their cars.

They want a starter that starts — always. Lighting and Ignition must also be absolutely dependable.

Manufacturers are expected to give buyers a car proven in every particular.

Four years were given to the perfecting of the Westinghouse System of Ignition, Lighting and Starting, before it was offered to the automobile trade.

The buyer can be sure that when a car is equipped with the Westinghouse System of Ignition, Lighting and Starting, there is nothing to worry about It's automatic, and starts and lights at the press of a button.

The following statement has great weight with automobile buyers: "The Westinghouse Company backs its System of Ignition, Lighting and Starting with all its resources It is in unequaled position to furnish service to manufacturers, agents and dealers who use its equipment, through its forty-five offices located in every large city in the country."

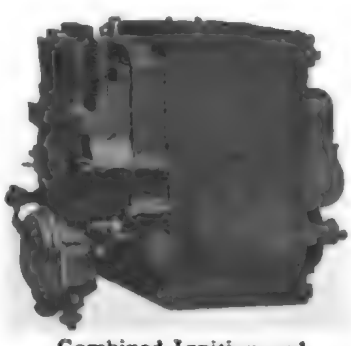
Equip your cars with the Westinghouse System

Westinghouse Electric and Manufacturing Company

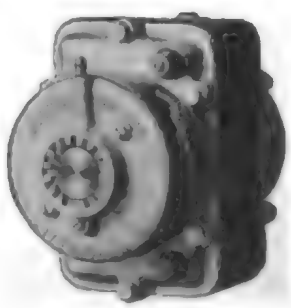
Sales Offices in 45 American Cities **EAST PITTSBURGH, PA.**



Lighting Generator



Combined Ignition and Lighting Generator

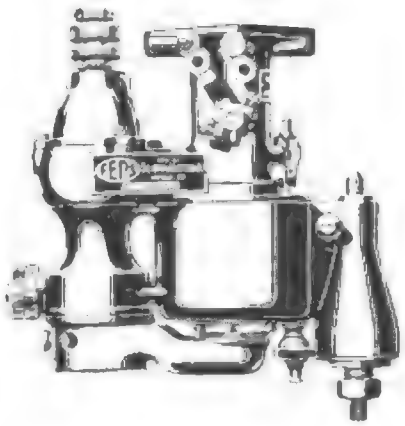


Starting Motor

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"A Giant in Power"

FEPS CARBURETOR



THE FEPS CARBURETOR makes it possible for every motor car owner to realize his idea of what a carburetor should be. The wonderful flexibility, the increased power, the 25% to 50% increase in mileage per gallon of fuel and the extra reserve speed are a startling revelation to every owner whose car is "Feps equipped."

The balky gasoline-guzzling carburetors to which motor car owners have tried to reconcile themselves, are a thing of the past.

The Feps Carburetor, devoid of all springs, cams, balls and reeds, positively eliminates every feature that has placed carburetors in the "pest" class. It is absolutely dependable at all times, under all conditions and with any grade of gasoline. The Feps also embodies a never failing, quick starting device, thereby eliminating another source of much dissatisfaction.

There is no excuse for you to worry along further. We ask you to try the Feps on your car at our risk.

Write Dep't "F" for Illustrated, Descriptive Booklet

FEPS CARBURETOR

Schoen-Jackson Company

MEDIA, PENNSYLVANIA

FEPS CARBURETOR

"A Miser in Fuel"

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Detroiter

12th Among 192!

Only 11 Ahead—and 180 Behind! And Still Gaining Fast!

The Detroiter automobile in its second year—already occupies 12th place among the 192 American manufacturers of pleasure cars. With all their start, only 11 other makers will produce as many cars in 1913. It is a wonderful growth, and figured in percentage of annual increase, *far outpasses the record of any other automobile firm.*

Principal Distributors for the United States

BALTIMORE, MD.
Detroiter-Baltimore Company
BOSTON, MASS.
BUFFALO, N. Y.
Delmarle Auto Garage
CHICAGO, ILL.
CLYDE, OHIO
COLUMBUS, OHIO
E. P. Corbett
DETROIT, MICH.
Barber Motor Sales Company
FORT WORTH, TEX.
J. R. Overstreet
INDIANAPOLIS, IND.
J. M. Holmes
JACKSONVILLE, FLA.
KANSAS CITY, MO.
Southwest Motor Company
LOS ANGELES, CAL.
Y. R. DeVaul
LOUISVILLE, KY.
Inter-State Motor Car Co.
MILWAUKEE, WIS.
United Wisconsin Motor Company
MINNEAPOLIS, MINN.
Bruce Auto Company
NEW YORK CITY
K. C. Parker
OMAHA, NEB.
T. G. Northwall Company
PHILADELPHIA, PA.
Detroiter Philadelphia Company
PORTLAND, MAINE.
Spear Auto Company
PORTLAND, ORE.
H. L. Keats Auto Company
ROCHESTER, N. Y.
E. R. Latescher, Inc.
SIOUX CITY, IOWA
T. G. Northwall
ST. LOUIS, MO.
Brown Automobile Company
SAN FRANCISCO, CAL.
Carl Christensen
SHREVEPORT, LA.
Wray-Dickinson Sales & Garage Co.
WEBSTER, S. D.
South Dakota Motor Car Company

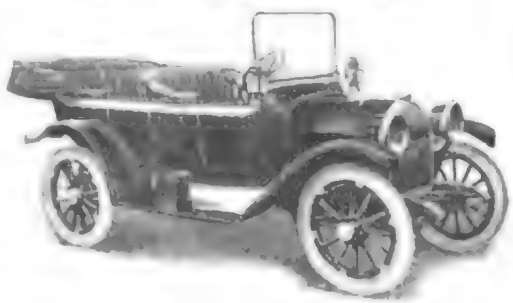
Why the 180 Were Outstripped

The 180 who fell behind, in the main, have been those who did not realize the popular demand for a *good looking car* that runs economically and wears well—at less than $1000. The makers of the Detroiter *did* realize it—brought out this strikingly handsome car that shows its breeding in every line, built into it all the nine highest grade features of construction that heretofore only the costliest cars have possessed, and then, by superior factory methods, brought the cost down to $850 and $900.

As to Dealers:

Dealers have taken on this car with eagerness. They have all made money, for buyers everywhere have been quick to respond to the tremendous value offered. Over 400 of these value-knowing dealers have been sharing Detroiter profits. They are the kind of men who stick. Probably your town is represented—though a few good territories are not. If it's *not* represented, show us you're the man we want by being first to see the opportunity and to write for our proposition.

$850 and $900



BRIGGS-DETROITER CO., 449 Holbrook Ave., Detroit, U. S. A.

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HYATT QUIET BEARINGS



THE Hyatt Flexible Bearing presents practical as well as theoretical advantages, from every viewpoint. It is the result of combining a correct theory and modern specialized manufacturing.

A bearing of quality—quiet, efficient, simple and durable—is the sole product of the Hyatt Factory. It is flexible and non-adjustable. Into it are put the best of steels, all carefully tested in the Hyatt laboratories and heat treated to give them maximum possible strength.

To this is added the service which an efficient organization renders car builders and car users through its sales and mechanical departments. Hyatt service constitutes an absolute insurance against bearing difficulties.

"Maximum Practical Value" tells the story in three words.

HYATT ROLLER BEARING CO.
DETROIT. MICHIGAN
WORKS, NEWARK, NEW JERSEY

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HOFF
SPEED

Again Hoffecker, standard on the famous Apperson line. A wise selection made by the men who built the first automobile and who have been building them for twenty years—men of ripe judgment and the experience of years back of them.

Standard Equipment

Recognition of Hoffecker speedometers by car manufacturers is growing. This is proof positive of sterling records of performance made by these speed recorders. You must take the judgment of car manufacturers, who could not afford to jeopardize the quality of their output through the selection of unreliable parts and accessories.

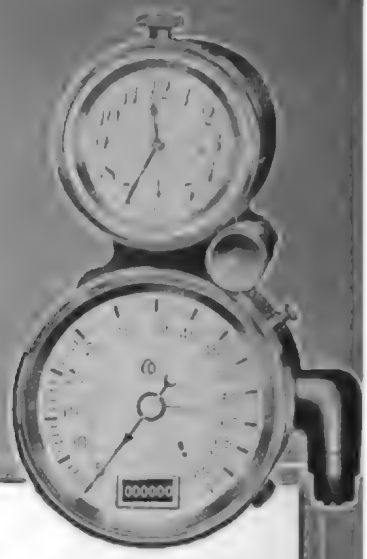
You, as a dealer who may be handling one or more lines of cars, will know how necessary it is that every part of the equipment exemplifies **quality.**

Through years of test Hoffecker Speedometers have proved their superiority. They embody scientific construction, refinement of design, and artistic appearance. They guarantee accurate speed recording, long life—they also add most materially to the appearance of the car.

THE HOFFECKER COMPANY

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ECKER METER R



Hoffecker Speedometers embody exclusive features, including a daily trip which can be quickly set to any desired mileage—a fractional mile register—a hand that remains steady, regardless of car vibration.

1913 Apperson CAR OUTPUT

Specify Hoffecker Speedometers on the cars you sell—insist upon them—and if you are not as yet fully satisfied concerning the claims set forth here, then write to us and we will show you in detail just why the Hoffecker Speedometer has more dollar-for-dollar value incorporated in it than has any similar device.

We spend more money in the purchase of brains, material and equipment—less money in extensive, scattered advertising campaigns.

You can tell your customer this. We are prepared to prove it.

Bear this well in mind. You cannot specify an instrument that offers more quality points than does the Hoffecker Speedometer.

Remember these facts when you are ordering your cars—remember them when you are selling a speedometer to go on a car already operating in your territory.

Main Office: Motor Mart, Boston, Mass.

An Active Journal Covering an Active Field

Things are happening every day in both motorcycling and bicycling and every week these happenings are accurately reported in the pages of this paper

THE OLDEST AND MOST INFLUENTIAL CYCLING JOURNAL IN THE WORLD

THE BICYCLING WORLD (FOUNDED 1877) and MOTORCYCLE REVIEW

Published Every Tuesday

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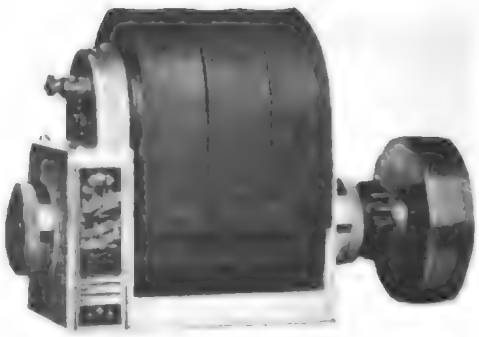
Sample Copy Sent Free on Request

Bicycling World Company
1600 Broadway
New York City

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Auto-Liter



We Are the Largest Makers of Starting and Lighting Devices

WE are the largest exclusive manufacturers of electrical starting and lighting devices for motor cars in the country. Our production facilities are unrivaled in the automobile accessory field. We guarantee superior quality and service.

Our factory occupies nearly 100,000 square feet of floor space. It is devoted entirely to the production of "Auto-Lite" electric starting and lighting devices. ***Our business is not a "side-line"***—hastily developed to meet a demand for such appliances. ***We are pioneers in the business.***

Our automatic, labor-saving machinery is the most modern obtainable. It is absolutely accurate in operation. Every part of the Auto-Lite system, when it comes to the assembling bench, is machined to one-half of one-thousandth of an inch. Every part is made in the Auto-Lite plant.

Our workmen are experts—trained by years of experience in building electrical appliances. Each and every one is a specialist in his line.

No order is too big for us. We are prepared to handle the largest contracts on short notice.

Our product, consisting of two mechanically independent units operating on a six-volt current, is a built-in part of the new car—not an afterthought hastily developed to meet the demand for an electrical starter and lighter.

We want every manufacturer to know the simplicity and ruggedness of the Auto-Lite system—and our capacity for prompt service on large deliveries.

We have an attractive proposition for dealers on lighting alone.

Every prospective automobile owner should know that his new car is equipped with the best starting and lighting system made. The Auto-Lite device will interest and impress him.

We have handsomely illustrated catalogues and literature, interesting and highly important to manufacturer, dealer and prospective purchaser. Your request will bring them. Write today.

The Electric Auto-Lite Company

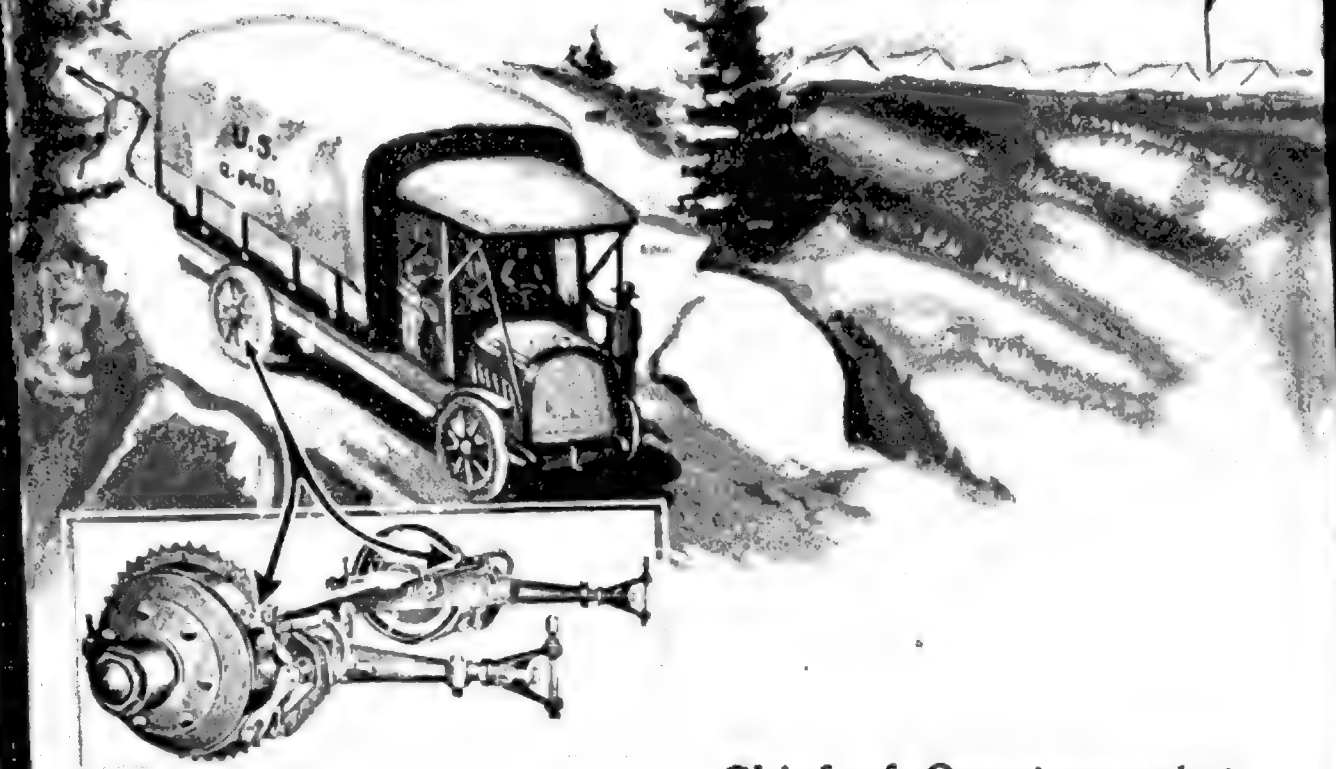
Main Office and Factory, Toledo, Ohio

BRANCH OFFICES: New York Kansas City San Francisco

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SHELDON

Double Brake Rear Wheel Equipment



Chief of Quartermaster Corps, of War Department, Issues Specifications for Motor Trucks for Army Use.

"**Brakes**—Two sets, both attached to rear wheels; one set operated by pedal, other by lever."

¶**Sheldon Double Brakes on Rear Wheels** meet the Government specifications.

¶**Equip Your Trucks With Sheldon Double Brakes** and bid on the **Army Trucks.**

¶**Army Takes No Chances With Jackshaft Brakes,** by demanding that all **Army Trucks** be equipped with both brakes on rear wheels.

¶**Jackshaft Brakes** are no stronger than the chains. Could you skid the wheels and stop your truck if the chains broke or jumped off the sprockets? ? ? ? ? ?

¶**You Can Not Depend** on jackshaft brakes skidding the rear wheels.

¶**Either One of Sheldon Double Brakes Will Do It.**

SHELDON AXLE CO., Wilkes-Barre, Pa., U.S.A.

Chicago Branch—68 East 12th St. Detroit Branch—1215 Woodward Ave. San Francisco Branch—444 Market St.

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Knox

LITTLE SIX
"PASSES THEM ALL"



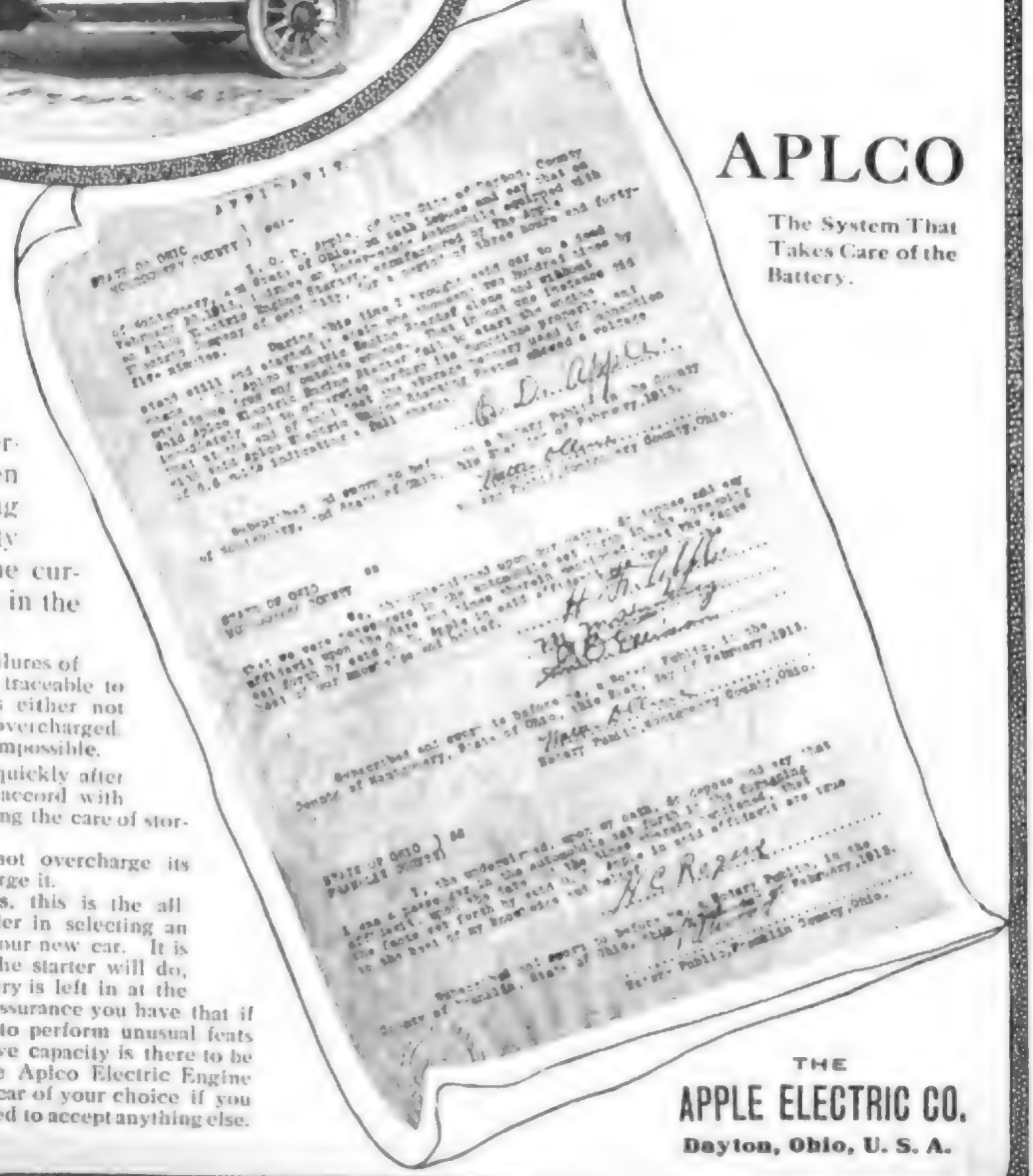
Made in New England at Springfield Massachusetts
By the Knox Automobile Company
Ask for "Knox Knowledge"

1200 Starts

From a Standstill

And the Battery Full at the Finish





In three hours and forty-five minutes this car was started one thousand two hundred times from a standstill with the Aplco Electric Engine Starter. An average of a start every ten seconds, yet in running a distance of only forty feet between stops the current used was replaced in the storage battery.

Ninety per cent of the failures of Electric Starters is directly traceable to the storage battery. It is either not charged enough or else overcharged. In the *Aplco System* this is impossible.

The current is replaced quickly after each start, yet in perfect accord with scientific principles governing the care of storage batteries.

The *Aplco System* will not overcharge its battery—it cannot undercharge it.

Prospective Car Buyers, this is the all important feature to consider in selecting an electric engine-starter for your new car. It is not the spectacular stunts the starter will do, but the condition the battery is left in at the end, that counts. It's the assurance you have that if the system is called upon to perform unusual feats of endurance that the reserve capacity is there to be used without fear . . . The Aplco Electric Engine Starter will be put on the car of your choice if you specify it. Don't be persuaded to accept anything else.

APLCO

The System That Takes Care of the Battery.

THE
APPLE ELECTRIC CO.
Dayton, Ohio, U. S. A.

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HEAVY CAR TYPE FISK TIRES

The Great Service of Fisk Tires Is Directly Due to the Exclusive Heavy Car Type Fisk Construction

From every corner of the globe where Heavy Car Type Fisk Tires are used come reports of *Greatest Service.* These reports prove:

First, that Fisk design is right; second, that the proper materials are used; third, that these materials are blended in the proper proportions to make a "balanced" whole, a tire each part of which is attuned to the other so as to work in perfect harmony for a common end—that end being SERVICE.

The exclusive Fisk HEAVY CAR TYPE Construction is responsible for this tire perfection. As the name implies, it is a construction providing surplus strength for the severest strains of heaviest cars. With these strains properly taken care of there can be no question of Greatest Service on lighter vehicles.

Heavy Car Type Fisk Tires have exclusive points of superiority. To lessen the possibility of puncture there are two breaker strips instead of one. An extra layer of rubber on the tread greatly increases the life of this part of the tire, while the Heavy Car Type Construction allows a thick cushion of pure para rubber between the breaker strip and the fabric, minimizing shocks from stones and uneven road surfaces.

The side walls of Fisk Tires are especially reinforced to prevent rim cutting.

The added quality called for by the exclusive HEAVY CAR TYPE Construction means added expense in manufacture, but never once has The Fisk Rubber Co. consented to the slightest reduction in the quality of its product. This attitude means satisfaction on the part of the Consumer, and Business Permanence to the Dealer.



Write to Dept. 23 for Our Dealer Proposition

The Fisk Rubber Company

Factory and Home Office **Chicopee Falls, Mass.**

DISTRIBUTORS

THE FISK RUBBER COMPANY OF N. Y. BRANCHES IN 41 CITIES

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R-C-H "Twenty-Five" Completely Equipped $900 F. O. B. Detroit

THE CAR

Wheelbase—110 inches.

Motor — Long-stroke, four cylinders cast en bloc; 3¼ in. bore, 5 in. stroke. Two-bearing crankshaft. Timing gears and valves enclosed. Three-point suspension.

Steering—Left Side. Irreversible worm gear, 16 in. steering wheel. Throttle control on steering column.

Control — Central Lever operated through H-plate integral with universal joint housing just below. Hand lever emergency brake at driver's right. Foot accelerator in connection with hand throttle.

Springs—Front, semi-elliptic; rear, full elliptic and mounted on swivel seats.

Frame—Pressed steel channel.

Axles — Front, I-beam, drop forged; rear, semi-floating type.

Transmission—Three speeds forward and reverse; sliding gear; selective type.

Construction—Drop-forgings wherever practicable; chrome nickel steel used throughout all shafts and gears in the transmission and rear axle; high carbon manganese steel in all parts requiring special stiffness.

Bodies—Touring car, full five-passenger English type; extra wide seats. Roadster, two passenger, English type.

EQUIPMENT

Tires—32x3½.
Large gas headlight with Prest-O-Lite tank or generators; oil side and tail lamps. Electric lighting outfit by special arrangement.
High-grade magneto.
Stewart speedometer.
Demountable rims.
Extra rim and holder.
Tally-ho horn.
Jiffy curtains—up or down instantaneously.
Top and top cover.
Windshield.
Tool kit. Jack, Tire repair kit, Pump.
Robe rail.

Proven and Tested in Every Country

THIS is the car that made good in not one country—but in 45 countries. It stood the big test that proves, demonstrates and vouches for the car, the factories that build it and the men who run the factories. It is proof absolute of R-C-H "Twenty-Five" reliability and dependability any place you take it.

If R-C-H factory production were not RIGHT, how could the car stand the wagon trails and corduroy roads of every automobile country under the sun? And if the R-C-H "Twenty-Five" is not made RIGHT of the very best materials, why do the people of 45 nations buy it?

The R-C-H "Twenty-Five" is the result of ample finances, 100 per cent efficient factory equipment, concentration on one chassis and the making of all working parts in the R-C-H factories.

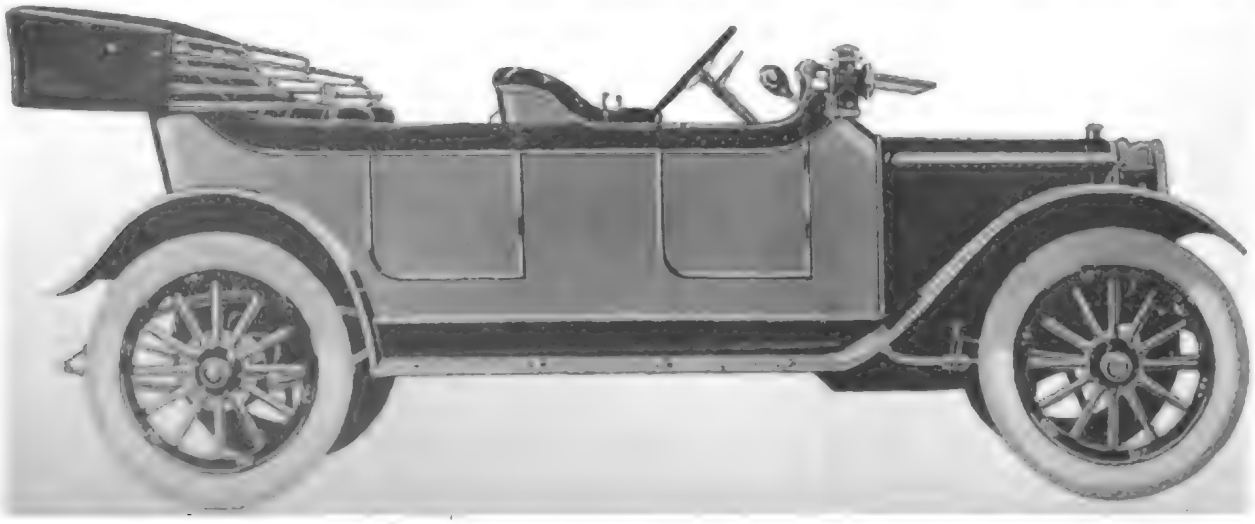
This car costs more to build than any similar car made and is bigger, better made, more comfortable, more serviceable and more completely equipped than any car below $1200.

Any R-C-H dealer will prove it. But see him today. Delay means disappointment.

R-C-H Corporation

704 Lycaste Street **Detroit, Michigan**

Represented by Branches and Distributors in All the Cities of the World



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History of the Steering Ball

A 

B 

C 

D 

E 

F 

¶ It might seem at first thought that the little steering-ball of the Timken-Detroit Front Axle, like Topsy, 'just growed,' or just happened.

¶ Well, it didn't. It was developed by years of study from a crude affair to a graceful, accurate thing, with a reason in every line and curve.

¶ Timken Experience was the teacher.

¶ In the early days, every axle maker merely bent up the end of his steering-arm and turned the tip into a ball, as shown in figure 'A.'

¶ It didn't take long to learn that this was too crude and inaccurate. The arm itself had to be elastic, the ball had to be very hard to resist wear. Different steels—different heat-treatments were required because the arm and the ball had very different duties to perform. So we came to a ball whose shank passed through the end of the drop-forged arm. It was a great improvement, though far from the present state of perfection.

¶ Then began the real evolution of the Steering-Ball of the

Timken-Detroit Front Axle

¶ First, the shank was straight and fitted snugly in its hole; rivetting the lower end pulled its collar firmly against the top of the arm, like figure 'B.'

¶ Whenever a break occurred it was always right at the bottom of the ball itself, so its neck was strengthened by a fillet and it looked like figure 'C.'

¶ After that there were fewer breaks, but these few came just above the collar, so the shank was enlarged at the collar and tapered toward the ball till it looked like figure 'D.' For added strength a castellated nut below replaced the rivetting.

¶ While this evolution was in progress, the axles were getting the severe jolts, jars and vibration of every-day service in thousands of cars, and sometimes, after long wear, the tightening of the nut underneath failed to hold the collar of the shank securely against the arm. That was easy to overcome by tapering the lower part of the shank so it would draw down to a tight fit, and could be drawn further down as vibration caused some looseness and wear. It looked like figure 'E.'

¶ It took a long time to bring out the fact that after thousands of miles of pound and vibration and taking up for wear, a time would come when the shoulder would meet the top of the arm and further take-up was impossible.

¶ So we increased the angle and left off the collar, as shown in figure 'F.' Now you get the tightest kind of a snug fit at the start, and keep it tight by turning up the nut as slight wear occurs. There is practically no limit to the amount of adjustment.

¶ In a previous advertisement we told how the ball itself is ground after hardening so it is a true sphere—and how a perfect sphere prevents pounding and the wear that would make it unsafe.

¶ The steering-ball with its shank is one of the smallest parts of a Timken-Detroit Front Axle—yet very important as are all the other parts, large and small.

¶ This history of the ball is just like the stories of development of every other part. The ingenuity and the study of able designers couldn't possibly foretell everything that experience was bound to show up.

¶ In addition broad experience covering hundreds of thousands of cars of every type—pleasure and commercial—working under every possible condition of service—has been a prime essential in the evolution of axle parts that will give the maximum of service to the user.

¶ From the dawn of the motor-car industry Timken-Detroit engineers have been getting just such experience.

The Timken-Detroit Axle Company

Detroit, Michigan, U. S. A.

The only axle manufacturer licensed to make axles equipped with Timken Tapered Roller Bearings

20

OPEN LETTER (NO. 3) FROM IR.

MAXWELL MOTOR COMPANY

INCORPORATED

DETROIT, MICHIGAN

March 22, 1913

SUBJECT: "WHY WE DID NOT USE ALL OUR PLANTS"

Gentlemen:-

You are of course aware that when the group of capitalists who financed the new Maxwell Motor Company, bid in at the Receivers sale, all the plants and other assets of the late United States Motor Company, they secured a number of factories for the making of automobiles and automobile parts, that are among the best in the industry.

To refresh your memory: There were the following plants:

Providence Engineering Works,	Providence, R.I.
Maxwell-Briscoe Company,	Auburn, R.I.
Maxwell-Briscoe Company,	Tarrytown, N.Y.
Briscoe Manufacturing Company,	Newark, N.J.
Alden-Sampson Company,	Detroit, Mich.
Brush Runabout Company,	Detroit, Mich.
Stoddard-Dayton Company, (Two factories)	Dayton, Ohio.
Briscoe Manufacturing Company,	Detroit, Mich.
Courier Motor Company,	Dayton, Ohio.
Columbia Motor Company,	Hartford, Conn.

Also the plant of the Flanders Motor Company at Detroit.

Combined acreage,	241.5
Combined floor-space,	2,684,648 sq.ft.

Now it will perhaps be news to you that we do not propose using all these plants--and the reasons will be interesting to you as showing how quality is put into a car and at the same time price is brought down to within the reach of thousands.

Take for example, the plant at Providence, R.I. This would be considered a splendid plant by some automobile concerns. It is rich in history, in tradition and in past achievements. Here George Corliss learned his trade. Others equally famous worked in this plant in its halcyon days. But it won't answer our needs today. We have sold it. Admirable for other lines, but not for this.

The Tarrytown plant we will also offer for sale, because the land value is too high for automobile manufacturing purposes, and it would be necessary to purchase many additional acres and erect

MR. FLANDERS TO DEALERS

buildings to take care of the quantity of cars we intend to produce. Besides, the 5,000 men necessary to man such plants, would have difficulty in securing living quarters in Tarrytown.

The Auburn, R.I. plant, consisting of 250,000 sq.ft. of floor-space, excellent three story brick mill construction, we offer for sale because, tho an excellent labor centre, there are good manufacturing reasons why it is not an economical place to produce automobiles.

Also, for similar reasons, and because they are located at too great distances from the other plants and from our centre of operations, we will dispose of the Briscoe plant at Newark and the Courier plant at Dayton.

Do you know, that the percentage of profit on automobiles is less than almost any other line--farm implements, furniture, pianos, sewing machines, etc. Much less. And competition is keener. We have no trusts, no monopolies, in this business, yet --nor are we likely to have.

The only chance we see for success is in producing cars in quantities, contenting ourselves with a small profit per car so as to get the selling price down to within the reach of thousands who must absorb this product.

And this can be done only in plants where the highest efficiency can be obtained--almost ideal working conditions. In other words, light, ventillation, sanitation.

Then the latest types of automatic and labor-saving tools must be installed. The equipment must be faultless.

Our plants in Detroit, in Dayton and in Newcastle, are of the latest type concrete and brick construction; "saw-tooth roof" type; mostly "ground floor", and admirably adapted for economical manufacturing. These we have re-arranged, re-equipped and laid out for the building of every part of every model in quantities.

Each plant will be devoted exclusively to the making of one model--"In the Flanders plants", we make the "50-6"; in the Dayton plants, the "35-4", and in the combined Brush and Sampson plants, which are on the same tract of ground--45 acres--every last part of the "25-4" will be made.

I claim you can't make two chassis models in the same plant and keep both up to concert pitch--make it the leader in its class, and nothing short of that will satisfy us.

Yours very truly,

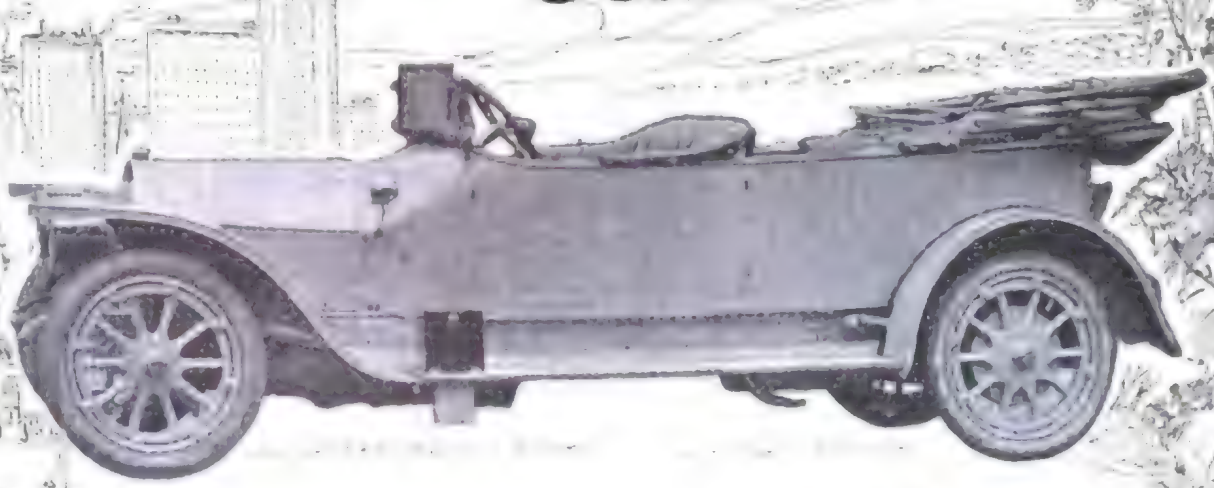
MAXWELL MOTOR COMPANY (Inc)

Walter E. Flanders.

President and General Manager

Lancia Cars

"They copied all they could follow,
But they couldn't copy my mind,
And I left 'em sweating and stealing
A year and a half behind."
—Kipling



DEALERS You Can Sell This Car

"The Best of Europe At American Prices"

The Lancia propoganda has taken root and is growing in America—and the reason is mighty obvious.

There is a class, Mr. Dealer, and a restricted one at that, who understands, appreciates and buys this peer of light European cars—(we will send you the names on request).

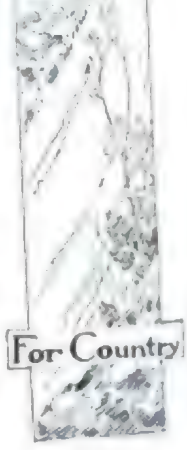
And there are those in ***your*** territory to whom its combination of strength, efficiency, simplicity and design will appeal.

The Lancia is the best of Europe at American prices—meaning that the purchaser of a Lancia car does not have an extravagantly priced European novelty of freak design—

But a ***real service*** car from Europe—a masterpiece of European design, steel and finish—made and tested in the Alps under the personal supervision of Vincenzo Lancia himself—with a guaranteed value, pound for pound, dollar for dollar greater than that offered by any American or European manufacturer.

Do you want to sell a car of class, service and beautiful design to the fastidious and critical? If you do, then come to New York if possible—see and know the Lancia—or write and let us give you details of the "20" and "30" mounted with coach work in keeping with the chassis.

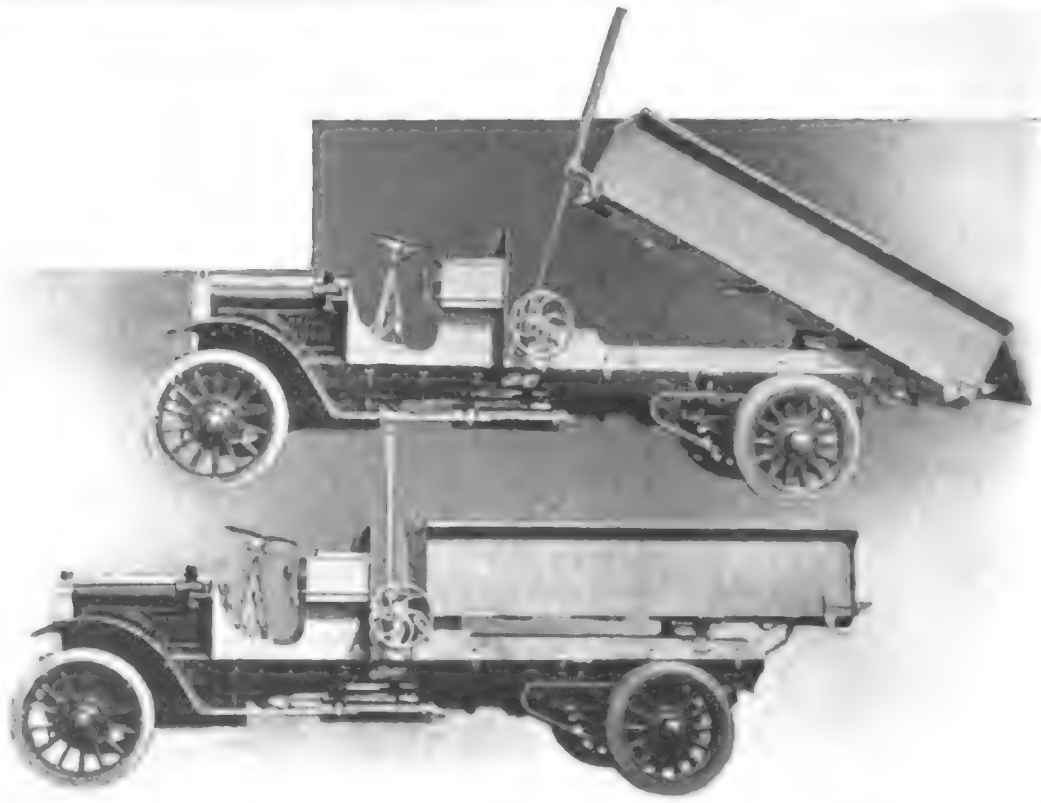




ADAMS LANCIA COMPANY

235 West 38th Street **NEW YORK, N. Y.**

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Wherever Trucks Are Sold, the Name "Atterbury" Stands for Representative Quality

These trucks practically sell themselves on the basis of proved service. They are without exception the best sellers in America.

We call attention here to the fact that the United States Government has placed orders with us for a large number of 1500 pound delivery trucks, for parcel post service. Uncle Sam has plenty of money to spend, but he is by long odds the most critical, hard-to-please customer in this country. He is expert and takes no man's word. This statement in itself will sell

Atterbury Trucks

Note that Atterbury design follows accepted standard specifications, covering material, workmanship, motors, frames, etc., which good practice has been fixed for different sized trucks.

These specifications which today lay down the standard of truck construction in America are practically all creations of the Atterbury factory. The radical, advanced features in Atterbury trucks are not experiments—they are absolutely necessary to the operation and life of a motor truck and they have been tried and proved correct.

Atterbury dealers handle a complete line, from the 1500 pound shaft drive delivery wagon up to the five ton truck—including one, two, three and four ton machines.

Dealers—Our prices are right—our arrangement with you liberal—our advertising is creating general interest—our sales department is your assistant. Above all, our trucks, standard, ready sellers, because they "make good."

We want **you** as part of our selling organization.

THE ATTERBURY MOTOR CAR CO., Buffalo, New York

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100 PER CENT EFFICIENT



The Leece-Neville Starting and Lighting System is the only system that has proven so successful as to be copied by several other manufacturers. Yet it has never been equalled for simplicity, certainty of operation and lasting qualities.

LEECE-NEVILLE
Lighting and Starting System

For more than a year the Leece-Neville System has been standard equipment on the Haynes car. Its operation in service has been so perfect that it is known as the 100 per cent. efficient system. This efficiency counts big in the service end—it counts big to the owner to have his starter always in working order—it counts big in the sales end—no excuses needed.

We will be pleased to send you more complete information on request

The Leece-Neville System is made in two models—a double-unit system (generator and starting motor separate) and a single-unit system (motor and generator in one unit) for lighting and starting.



The Leece-Neville System is the only one powerful enough to furnish current for lights and crank large marine engines and it is standard equipment on engines of the Loew Mfg. Co., Cleveland, on their famous "Loew Victor."

THE LEECE-NEVILLE COMPANY
CLEVELAND, OHIO

American Axles



Worm Drive

WITH prompt recognition of the advantages claimed for the Worm Drive, and after exhaustive research, tests and comparisons, we secured—more than a year ago—exclusive American rights, as axle manufacturers, to use the Lanchester-Daimler type of this gear.

The superiority that has long been conceded to this particular Worm Drive in England and on the Continent, is now fully recognized in America. It challenges the consideration of every progressive motor car manufacturer.

We are offering full floating *American Axles* embodying this famous Lanchester-Daimler type of worm gearing, and suitable for either gasoline or electric vehicles. The same perfection of design and workmanship which has always characterized our bevel drive axles, is to be found in these worm driven equipments. For motor cars of the better class, *American Axles* cannot be excelled.

THE AMERICAN BALL-BEARING COMPANY, Cleveland, Ohio

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Our Annual Catalog is the largest, most complete, up-to-date and authoritative Dictionary of the Automobile Supply Market of any book published. It has come to be recognized as one of the Standard Reference Works of the Industry, and is on file in the TECHNOLOGY DIVISION of the NEW YORK PUBLIC LIBRARY, FIFTH AVENUE and FORTY-SECOND ST., NEW YORK CITY, and other Public Libraries, and in the offices of American Consuls, Universities, Y. M. C. A. Schools, Publishers, Automobile Clubs, Engineers' Offices, Purchasing Departments, Etc.

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MANUFACTURER, JOBBER, EXPORTER AND IMPORTER

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THE ATWATER KENT SYSTEM

has been silently advertised from coast to coast by the best advertising anybody can have—the personal endorsement of over 100,000 satisfied users.

The Atwater Kent Ignition System has no rival—no competitor. We do not use this term metaphorically, but in a literal sense.

You may think this is the use of a trite advertising term, but in this case it is nothing of the kind. That the Atwater Kent has no rival in the opinions of thousands of users has been demonstrated to us many-many times, when in ordering their new cars they have specified that they should be "Atwater Kent equipped."



There are a number of other good reasons for the superiority of the Atwater Kent System over the magneto and it is worth your while as a jobber, dealer or prospective buyer, to weigh and consider them carefully.

Space forbids our mentioning these reasons even briefly, but if you will write for our booklet "D," we will give you some of them. Then ask the motorist who drives a car "Atwater Kent equipped" and he will tell you the others, and the best reasons why the Atwater Kent Ignition System has no real rival.

ATWATER KENT MFG. WORKS **4940 Stenton Avenue Philadelphia, Pa.**

DISTRIBUTORS

New York—E. J. Edmond Co.; Chicago—Motor Car Supply Co., Pellets Magneto Exchange; San Francisco—Chanslor & Lyon Co., Weinstock-Nichols Co.; Los Angeles—E. A. Featherstone; Seattle—Chanslor & Lyon Co.; Portland—Ballou & Wright; Omaha—Omaha Rubber Co., Powell Auto Supply Co.; Dallas and Houston—Fisk Co. of Texas; Wichita—Hockaday Auto Supply Co.; St. Louis—Missouri Auto Specialty Co.; Salina—Lee Hardware Co.; Kansas City—Kansas City Auto Supply Co.; Milwaukee—Julius Andrae & Sons Co.; Detroit—Automobile Equipment Co.; Boston—Motor Supply Shop; Denver—Auto Equipment Co.; Hartford—Post & Lester Co.; Atlanta—Elyea-Austell Co.; Chattanooga—Southern Auto & Supply Co.

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Are Long Lived and Efficient



THE spark plug may seem of no consequence because it is small, but engineers consider it one of the motor's most important efficiency factors, also a point where most troubles are located.

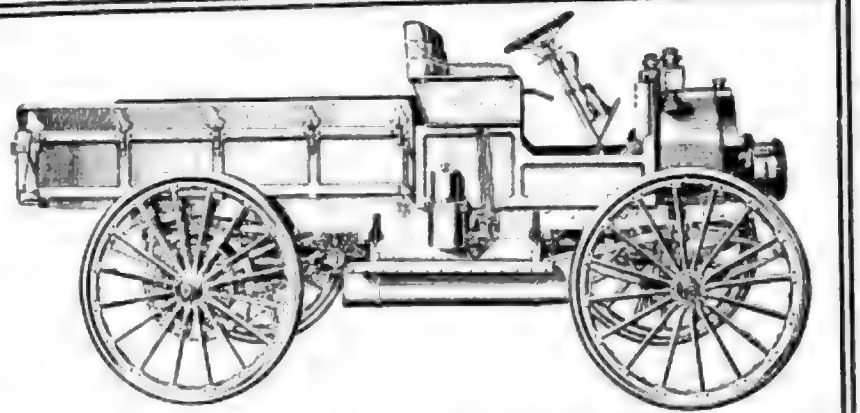
Don't leave a path for trouble! The mere insistence on Bosch Plugs gives you not only a perfect plug but one which will eliminate most of your troubles, one that will add just that ounce or two of efficiency which you are so earnestly seeking. Always insist on good plugs—Bosch Plugs—Buy Bosch Plugs Only.

$1.00 each, from your dealer or direct

Write today for "Locating the Spark Plug."
It tells you all you should know about plugs.

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A large number of prosperous tradesmen and merchants, wholesalers, contractors and builders, average business men scattered over every small and large community, and alert farmers in between, are looking for a serviceable motor truck. What they need, and are ready to buy on demonstration, is a medium draft—medium weight—medium priced, practical commercial car, that will meet completely their own needs and resources. They want a thoroughly high-grade car that will respond to all tests, make their deliveries, haul their products and material. The car that meets the needs of the great commercial public is the

International Motor Truck

The Utility Car That Has Made Its Way by the Way It's Made

As an all-round commercial car, the International Motor Truck fills the bill in every way. It is built to meet every test as a business car. It is moderate in draft, size, weight and price. It is unexcelled in efficiency, service and dependability.

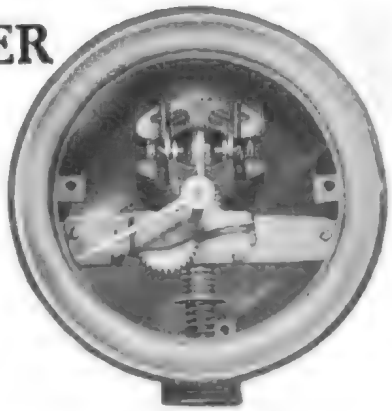
You should sell International Motor Trucks. Invest a letter or post card in this trade-making truck and write us for information and details of terms and territory.

INTERNATIONAL HARVESTER COMPANY OF AMERICA
(Incorporated)
155 Harvester Bldg. CHICAGO, ILL.

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CORBIN-BROWN SPEEDOMETER



BUILT with the precision of a high grade watch. Simple, durable mechanism insures absolute accuracy and thorough dependability.

Constructed on the centrifugal principle. Therefore, as accurate during the zero weather of December as during the torridity of July.

Impossible for indicator to "wabble."

Records total of 100,000 miles.

Tells you individual trip mileage, too.



All parts of specially hardened steel or brass.

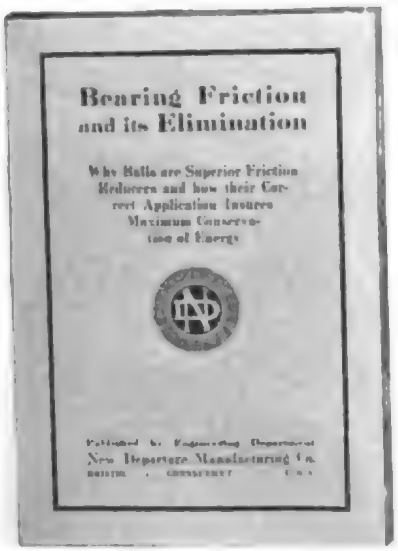
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CORBIN SCREW DIVISION, 213 HIGH STREET NEW BRITAIN, CONN.

Distributors: New York, Philadelphia, Chicago



Can We Send You a Copy of this Booklet?

Our Engineering Department has published the first of a series of booklets discussing the latest developments in the solving of of bearing problems.

This first brochure is entitled "Bearing Friction and Its Elimination," and aims to show why balls are superior friction reducers and how their correct application secures maximum conservation of energy.

The types of bearings particularly discussed and compared in this writing are the ball and roller bearings, as applied to all bearing points in the motor car.

It discusses and explains the growing tendency among engineers and manufacturers to favor the ball type of bearing, as evidenced by the summarization figures published by the "Horseless Age" in a review of 1913 pleasure car models. These figures show that ball bearings are used in the differential of 53 per cent of pleasure cars for 1913, as against 37½ per cent of the 1912 models; in the transmission of 75 per cent, as against 64 per cent; and in the rear wheel of 52 per cent, as against 42 per cent.

This brochure will interest you. Copy will be mailed you promptly on request.

THE NEW DEPARTURE MANUFACTURING CO., Bristol, Conn.

Western Branch: 1016-17 Ford Building, Detroit, Mich.

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Electric Company

(With a country-wide system of branches and service stations)

Designers and Builders
of
High Grade Starting and Lighting Equipment for Motor Cars
(Sold to car makers only)

Makers of magnetos for fourteen years.

Our country-wide service is available to each user of Remy equipment.

Write us today about our magneto exchange offer. We will make a liberal allowance for old equipment (any make)

REMY

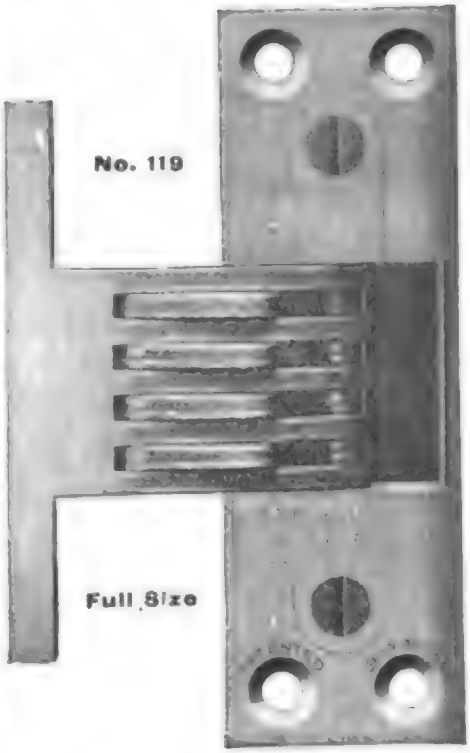
Pioneer Manufacturers of Ignition Equipment.

Factory and General Offices:
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The detachable and water-tight features of our No. 119 Automobile Door Hinge, in addition to the interlocking action, makes this the best, as well as the strongest constructed concealed hinge on the market. Made in two parts, it is easily attached and detached. Water will not reach the wood of the body through the hinge. When installed holds the door rigid and at the same time has a perfectly smooth action.

Send now for catalog and full particulars.

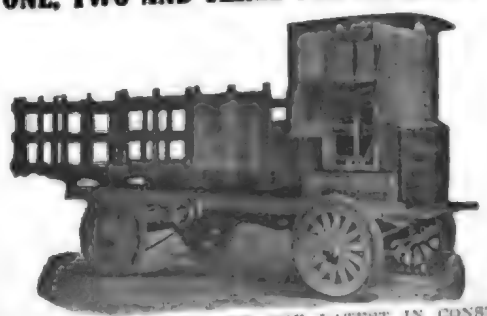


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Lauth-Juergens Trucks are Delivery Insurance

QUALITY DURABILITY
ONE, TWO AND THREE TON CAPACITY



LAUTH-JUERGENS TRUCKS ARE THE LATEST IN CONSTRUCtion, most powerful in operation and the motors are guaranteed against defective workmanship and material for the life of the truck. They are positively the highest class trucks made. Two cylinder, one-ton, four cylinder, one, two and three-ton. Four speeds forward. Herr-Bright ball bearing transmission made in our own shops of the finest tool steel, three-piece disc clutch, covered by patents owned by us. Send for 1912 Catalog and specifications. Prompt delivery on all models. Large publicity campaign just begun. Our quality will do the rest.

Reliable Agents: Secure Your Territory for 1912 at Once.

The Lauth-Juergens Motor Car Co., Fremont, Ohio.

Branches and Agencies

BOSTON—David Abrams, 131 Portland St.
NEW YORK—West Side Garage & Motor Co., 2630-32 Wabash Ave.
CHICAGO—The Lauth-Juergens Motor Car Co., Essex Building.
NEWARK, N. J.—Merchants Motor Car Sales Agency, 453 Dix Ave.
DETROIT, MICH.—Bierl Auto Truck Sales Agency, 455 Dix Ave.
DISTRICT OF COLUMBIA AND VICINITY—Howles Motor Sales Co., Inc., 1608 14th St. N. W., Washington, D. C.

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Universal Tire Pressure Gauge



For Sale by Tire Manufacturers, Jobbers, Dealers, Garages or

A. SCHRADER'S SON, Inc., 32 Rose St., New York

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KLINE KAR

"FORTY" $1985

The best four-cylinder forty horsepower car on the market with separate electric starting and lighting, and separate ignition systems. The economical four speed forward transmission is another big asset.

Address Dept. W for Catalog

KLINE MOTOR CAR CORPORATION

Richmond, Va. **York, Pa.**

Main Office and Factory, Richmond, Va.

Heart, Lungs & Liver

of your car—that's what your motor is—*and then some!* Worth while getting the advice of, say, a score of automobile engineers. That's what you get when you get a BUDA Motor. The way to get a BUDA is to INSIST on a

BUDA MOTOR

"the part that sells the car"

Pleasure Cars:
Hudson Motor Car Co.
Michigan Motor Car Co.
Henderson Motor Car Co.
Lenox Motor Car Co.
Schacht Motor Car Co.
Spaulding Mfg. Co.
Croxton Motor Co.
Nora Scotia Carriage and Motor Car Co.
Miller Motor Car Co.
and others

It was only after careful investigations that the partial list of discriminating manufacturers here shown asked us to make motors for them.

Trucks:
Service Motor Car Co.
Bowling Green Motor Car Co.
Durant Dort Carriage Co.
Hewitt Ludlow Auto Co.
Tellin Wagon Co.
Brantford Motor Truck Co.
W. Landshutt & Sons
Harvey Motor Truck Co.
Hurlburt Motor Truck Co.
Schacht Motor Car Co.
Chicago Pneumatic Tool Co.
Lord Baltimore Motor Car Co.
Rensenzer Motor Truck Co.
U. S. Government and others.

The BUDA "Little Six" — 3½ in. bore, 5½ in. stroke will be ready for delivery by April first and is a product worthy of the Company which was the Pioneer of the "Cast in Block" method in U. S.

1913 Specifications



Model "Q"

Models "T" and "Q" are also furnished in unit power plant type of construction.

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Hts. Sts. Madison Ave. CHICAGO — Ford Building DETROIT — 57th Street & Broadway NEW YORK CITY



FOR YOUR TRANSMISSIONS

The very best lubricant you can buy is the cheapest in the long run because it saves wear and repairs.

DIXON'S GRAPHITE GREASE No. 677

Is the best lubricant for enclosed transmission gears because it penetrates to every wearing surface, leaving a permanent graphite coating that reduces noise, saves wear, makes cool running, conserves power. And it is highly economical, too. Write for "Lubricating the Motor," No. 23 B—the autoist's authority on lubrication.

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NEW YORK

TELEPHONE 81 SPRING

ESTABLISHED 1871

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Jones Speedometers

measure speed by centrifugal force, which is stable, fixed and unvarying for each speed.

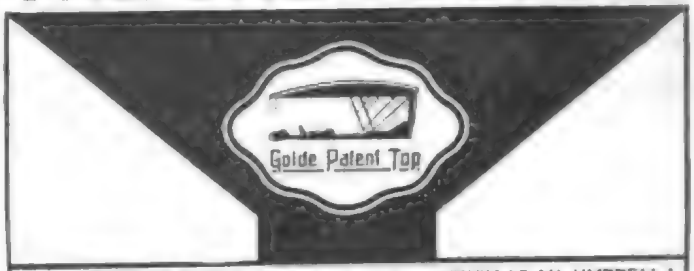
The instruments are permanently accurate because there is nothing to adjust, nothing to balance, nothing to counterpoise, nothing to compensate.

THE JONES SPEEDOMETER

Broadway at 76th St. **New York**

Plants { **Bush Terminal, Brooklyn, N. Y.** **New Rochelle, N. Y.**

THE ONE MAN TOP



CAN BE HANDLED BY ONE PERSON AS EASILY & QUICKLY AS AN UMBRELLA

INSTANTANEOUS PROTECTION

GOLDE-PATENT MANUFACTURING CO. 515 W. 56th ST. NEW YORK.

REMARKABLY RELIABLE



If you are not a user of FALLS NEVER-SLIP it is because you don't know about FALLS SERVICE.

They wear longest and stop the skid by not allowing it to start.

Our literature explains.

The Falls Rubber Co.

Cuyahoga Falls, Ohio

Agents, Dealers and Jobbers Wanted

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PAT'S PEND'G



Overheated Motors Support the Repair Man!



Know the temperature of your radiator! Read it right from the seats while you drive. Excessive heat indicates trouble. When the Motometer says "Stop!" obey and investigate. It will eliminate repair bills.

(Front View)

(View from Seat)

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Chicago Branch, 1322 Michigan Ave.



Patent "Luxury" Folding Seats

Do you wish to make your car more comfortable by installing a pair of auxiliary seats? If so, have the best. Our seats are made in five styles. Send for catalogue.

HODGE & GRAVES CO.,
Amesbury, Mass.

SPLITDORF

"Always There"

Plugs may come and plugs may go, but SPLITDORF PLUGS go sparking on forever. Make a clean sweep—equip with SPLITDORF as SPLITDORF PLUGS need no cleaning.

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SPLITDORF ELECTRICAL CO.

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Ask us to tell you about the wonderful new pole pieces and the Automatic Control Magneto.

THE EISEMANN MAGNETO COMPANY

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You Need This Catalog

We want you to write for the Solar Catalog before you decide on your motor lamps, for this is the most complete line of lamps on the market. Solar Lamps have been preferred by most motorists for the past fourteen years because of their brilliancy, their style, their strength and their several exclusive advantages—their special short focus lead glass lens mirror reflectors—the patented double ray light projection (in the Solarclipse), giving two distinct fields of light, for city and country use—the new black finish, the only such finish that's proof against heat and moisture—and other features that other lamps lack.

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CUBIT ELECTRIC HORN

Retail Price $3.75 Complete

Our dealers selling them by the thousands. A real signal with high toned musical blast. The logical successor to the bulb horn. Economical current consumer—gets better with age.

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The manufacture of this part requires—

1. Intelligent selection of open hearth or nickel steel of proper analysis.
2. Scientific heat treatments to carbonize and harden the exterior and produce a perfect bearing surface.
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Thorough knowledge of service requirements—a complete and modern heat treating equipment and long experience in manufacturing similar parts enable us to offer you the benefit of these essential features at an extremely low price.

Send blue prints for quotation.

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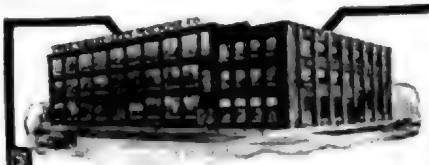
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will be standard on some of the best cars in 1914. Write today for our dealer proposition.

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"Packed in box like ball-bearings."



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Let us give you proof.

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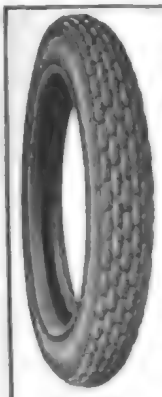
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Detachable Wire Wheels
fitted with
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Guaranteed the Best in the World
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Manufacturers of Auto Parts,
Kinwood Radiators, Fenders,
Kinwood Oilers, Gaskets,
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SPECIAL METAL STAMPINGS

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STAGGARD TREAD TIRES
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Motorists who use Republic Staggard Tread Tires will tell you that they—
Prevent skidding, make quick starts and short stops easy.
Give double mileage because of the full-thickness tread under the studs.
Most Widely Imitated of All
We guarantee the Republic Black-Line Red Inner Tube to be as nearly perfect as a tube can be made—and is a fitting companion for the splendid Republic Staggard Tread.
The Best Tube Made

Republic Staggard Tread

The Republic Rubber Co.
Youngstown, Ohio

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The One Mechanical, Never Failing Warning Device
Costs Little to Buy—Costs Nothing to Operate
No Battery—No Wire—No Bulb—No Motor to break down or fail to work.
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Automobile Frames and Special Stampings
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Manufacturers of pleasure cars and light trucks will find us able to fill orders promptly for
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WE ARE SPECIALISTS IN
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Get in touch with our Engineering Department. It is at your service at all times.
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Double Your Mileage
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Interlocks are complete inner tires—not inner shoes—placed between the outer casing and inner tube to strengthen the casing and protect the tube from punctures. They insure safety—make new tires give twice the usual mileage, and add 1000 to 5000 miles to old ones. Don't affect resiliency. Make your tires blow-out proof.
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write for our booklet giving facts about road tests, prices, testimonials, and our 1913 proposition.
DOUBLE FABRIC TIRE CO.
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PRESSED STEEL
FRAMES
A. O. SMITH COMPANY
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PULLMAN 1913

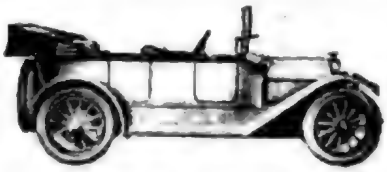
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4-38	4-44	6-66
$1,875	$2,150	$2,750

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PULLMAN MOTOR CAR CO., York, Pa.

Type 35
Series
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Electric
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The Champion Light Car

When motor car efficiency, power, durability, and speed are mentioned, all eyes focus on the Mercer.

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MERCER AUTOMOBILE CO. 700 Whitehead Road Trenton, N. J.

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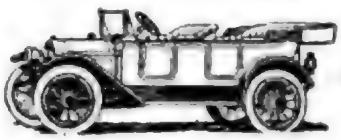
The name Croxton on your car will show that you have a machine built to stand hard usage and having features that make it the auto success for 1913.

Write for catalog of the "Six," Booklet A-2.

THE CROXTON MOTOR CAR COMPANY, Washington, Pa.



"Croxton Six"



EMPIRE

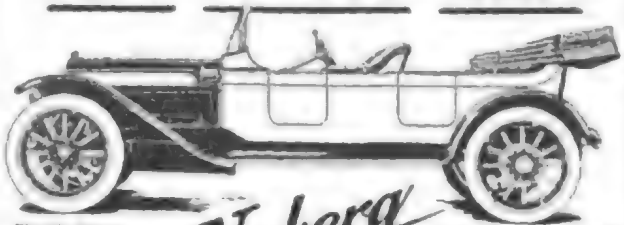
"The Little Aristocrat"

Model 31 108 Inch Wheel Base

The Completely Equipped Empire five-passenger touring car for $950—Equipment includes Demountable Rims, Oil Sight Feed, Dash Air Adjustment, Mohair Top and envelope, Windshield, Prest-O-Lite tank, Speedometer and Eisemann Magneto

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Electric Starter
Electric Lights
Center Control
Complete Equipment

Nyberg SIX $2000
FOUR $1650

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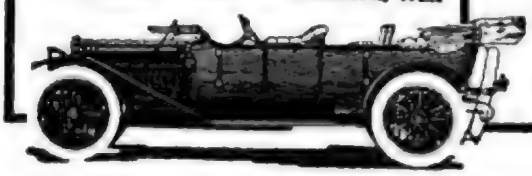
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Every part built in the KisselKar plant, which is equipped with every facility for economical manufacture. All KisselKars have extra liberal wheelbase and roomy tonneaus unsurpassed by any car at any price for comfort and capabilities. Write for catalog.

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"Thirty"
"Forty"
"Fifty"
60 H.P. "Six"

KisselKar prices include full equipment—self-starter, top, windshield, demountable rims, speedometer, electric lighting equipment, shock absorbers, etc.



Get acquainted with the standardized "Cole"

the car that is writing gasoline history. Learn what the

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will mean to you if you happen to be located in open territory.

Cole Motor Car Co. of Indianapolis



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The Kentucky Thoroughbred
"AMES 45"

Long stroke, powerful Continental Motor—Electric (Dynamo) Lights—Self Starter—Left Hand Drive—Full Equipment—"Amesbuilt" Bodies and Tops. A combination of power, speed, endurance and graceful lines. Price, fully equipped, $1,635. This is 1913's most remarkable car value. Backed by a reputation of 30 years it will win you from the first inspection. We have a most liberal proposition for good, live agents. Send for catalog.

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MAGNETIC PRINCIPLE

95% of all the speedometers to be made during 1913 will be built on the magnetic principle.

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Branches in all principal cities all over the world

Buffalo Electrics

PLEASURE CARS		TRUCKS	
Model 29—Runabout	$2600	2000 Lb. Chassis	$2200
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Correspondence With Dealers Solicited

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The Reasons for Jencick Quality and Jencick Prices are worth knowing.

JENCICK MOTORS
For Motor Trucks

from base to spark plug, have features that are "Different and Better."

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THE ULTIMATE CAR
(KNIGHT TYPE MOTOR)

The first American Car to adopt the Silent Knight Motor—the engine used by Daimler, Mercedes, Panhard and Minerva.

THE F. B. STEARNS CO.
CLEVELAND, OHIO
Branches and Dealers in 125 Cities

WARD LEONARD



Lighting - Starting

THE RESULT of TWENTY YEARS of EVOLUTION by ELECTRICAL SPECIALISTS

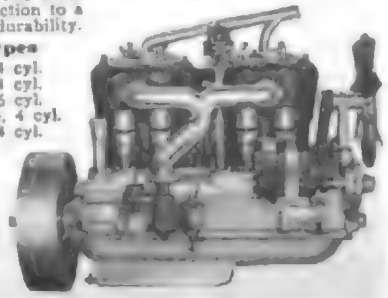
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The crank shaft is of large diameter—a self-contained oiling system supplied by a gear pump through the hollow crank shaft provides perfect oiling. The extra large bearings reduce friction to a minimum and increase durability.

All 4 Cycle—in 5 Types

3¼ in. bore, 5 in. stroke, 4 cyl.
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WISCONSIN MOTOR MFG. CO.
Dept 32
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your brakes if lined with



TRADE MARK **Raybestos** REG. U.S. PAT. OFF.

"THE ORIGINAL AND BEST ASBESTOS BRAKE LINING"

Because you can be sure that they will always grip and hold in any emergency.

THE ROYAL EQUIPMENT COMPANY
Railroad and Bostwick Aves., Bridgeport, Conn.
We also make Duplex and Raymond Brakes and Gyrex the Mixer.

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Be Prepared

to meet the demand we are creating for you on the

NEW POSITIVE LOCK STOP

TWITCHELL AIR GAUGE



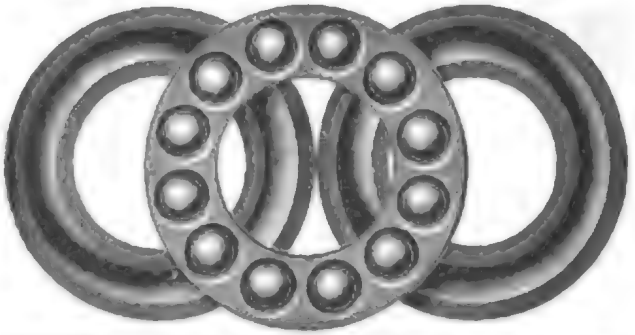
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Any Kind Every Kind Stock, or to Blue Print **Rims** Clincher Q. D. Demountable Channels

For Automobiles, Motor Trucks, Aeroplanes, Motorcycles, Bicycles.

We Also Make Axles and Hubs.

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Some automobile owners are always cleaning their spark plugs —others who use Reliance Plugs don't have to.

The Reliance book, "Ignition and Spark Plug Talk," tells why. Supposing you write today and get a copy.

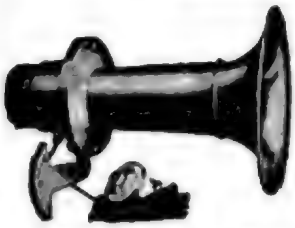
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"The Horn That Warns"



For Efficiency Get a Newtone Superior

Not only the cheapest but the best

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Automobile Supply Manufacturing Co.

Taaffe Place, Brooklyn, N. Y.

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Price Complete $24

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Convenient
Safe
Dependable

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Sole Licensed Manufacturers for the United States

70% More Tire Mileage

WIRE McCUE WHEELS

Save Tires—Save Fuel—Save Car. Make cars easier riding and easier driving. Stronger than any other practical wheel.

THE McCUE CO., Buffalo, N. Y.

Drop Hammer Forgings

cost very little more than castings. They are vastly superior and less expensive in the end.

WE ARE SPECIALISTS

in producing

DROP HAMMER FORGINGS

from special analysis steel.

Send prints of parts you will need in

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QUALITY AND SERVICE GUARANTEED

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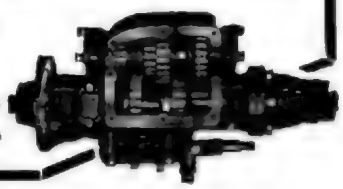
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Transmissions made by Specialists

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For Commercial Vehicles of from 500 to 10,000 pounds capacity.

For Pleasure Cars of from 20 to 60 H. P.



COVERT
Motor Vehicle Company
Sales Office — Detroit, Michigan
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Staver "45"—5 Pass. Touring Car.	Price	$1875
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HAYNES
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America's First Car—
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—Still It's Foremost

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Built to Last



THE SILENT CAR
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Our agency proposition will interest you. Write for it.

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THE UNIVERSAL CAR

We have had to double our gigantic output —and the demand is more than doubling. Nearly 180,000 have been sold and delivered. New prices $525 to $800. Dealers everywhere. Ford Motor Company, Detroit, Michigan.

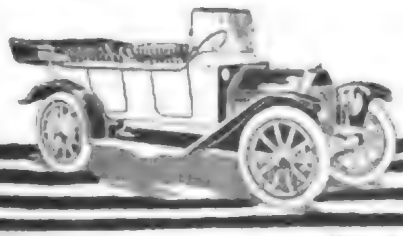


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Touring Car Fully Equipped

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Branches: New York, Detroit, Chicago, Kansas City, Atlanta

MARMON

"The Easiest Riding Car in The World"

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Four cylinders, 32-40 h.p., 120-inch wheelbase, electric starting and lighting system, left-hand drive, center control, nickel trimmings, with newest body types to meet every requirement and corresponding equipment—

$2,850 to $4,100

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Six cylinders, 48-60 h.p., 148-inch wheelbase, electric starting and lighting system, left-hand drive, center control, nickel trimmings, with body types to meet every requirement and corresponding equipment—

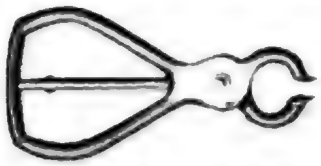
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The biggest live wire selling proposition that ever went across the dealer's counter. Get the details and you will surely order.

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RHINELAND BALL BEARINGS
"INSURANCE FOR BUILDER AND USER"
RHINELAND MACHINE WORKS CO——142 WEST 42ND ST. NEW YORK

FIAT
"THE MASTER CAR" SIXTEENTH YEAR
6 Cyl. 50 H. P., $5,000 4 Cyl. 55 H. P., $4,500
4 Cyl. 35 H. P., $4,000
(Completely Equipped)
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A tire filler 10 to 20 per cent. lighter than any other tire filler. A big proposition for dealers who are on the alert for more and better business. Write for details.
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"National" Steam Vulcanizers
GARAGE MODEL repairs three tubes and two casings at a time. Cheapest and best on the market. Get our special selling plan. Portable model for individual owners which will please your customers. List price, $12. Manufactured by
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will help you to increase your business while benefiting your customers. We will send any responsible dealer a pair on 30 days' trial. Write now. Good Agents wanted for unoccupied territory.
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OF EVERY DESCRIPTION
SAMPLES AND PRICES ON REQUEST
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For Pleasure Cars and Light Delivery Cars
Send for Booklet 53
The Motz Tire and Rubber Co.
Executive Offices:
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Look at our new middle name
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PENNSYLVANIA RUBBER COMPANY
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The Only Non-Skid Tires
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"A Giant in Power —A Miser in Fuel"
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The ONLY gas tank that when empty, can be immediately exchanged for a full one, ANYWHERE and ALWAYS.

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forces the water from radiator through cylinder water jacket, maintaining rapid circulation when car is in motion. Write for descriptive matter if you handle Ford cars.
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A Pure Food for Motors

¶ If there was a Pure *Oil* Law --like the Pure Food Law—90 per cent. of the present oils would be condemned.

INVADER OIL

is a PURE oil. It is distilled from Pennsylvania crude. It is filtered. It has a HIGHER GRAVITY, and is freer from carbon than any other oil made.

I-O-C GEAR OIL

"Puts Noisy Gears to Sleep"

¶ It is the only oil ever manufactured especially and exclusively for the lubrication of Automobile transmission gears.

¶ Write for descriptive booklet and prices.



INVADER OIL CO.
Lessees of Charles F. Bellows & Co.
80 Broad St., New York
Philadelphia Washington Boston

TIMES SQ. AUTO CO.

NEW YORK
1710-1718 BROADWAY

CHICAGO
1210 to 1212 MICHIGAN AVE.

NEW CARS
USED CARS
MOTORS
BODIES
TOPS and
EVERY
ACCESSORY
FOR THE
AUTOMOBILE

At From
20c. to 50c.
on the Dollar

We Are the Largest Dealers in the World in New and Used Cars and Factory Cleanups

The Bush Radiator

THE BUSH MANUFACTURING CO.
HARTFORD, CONN.

METZ "SPECIAL" $445

Completely equipped, fully guaranteed. 22½ H.P., 4-cylinder water-cooled motor, Bosch magneto. Artillery wheels, best quality 30" x 3" clincher tires. Makes 5 to 50 miles per hour on the high speed, 18 to 32 miles on 1 gal. of gasoline. You can secure EXCLUSIVE SALE in your territory. Send for Book "B."

METZ COMPANY, Waltham, Mass., U. S. A.

Glare Eliminator
Screen for Automobile Headlights

Tones down headlights for city driving and foggy nights—an auto necessity. Price 75c. per pair. Sell like hot cakes. Dealers, secure the agency quick.

F. H. TOBIAS
1931 Broadway, New York

The Stutz Has a Powerful Motor—

that will pick up on any road or hill at the touch of the throttle. It has attained a record second to none for consistent performance.

Write today for advance booklet A-13, Sturdy STUTZ Announcement, Series B.

IDEAL MOTOR CAR COMPANY, Indianapolis, Ind.



Magneto Plugs coax maximum power out of engine.
EMIL GROSSMAN COMPANY, Mfr., New York and Detroit

CHAMPION SPARK PLUGS

Special Designs for Every Type of Motor Made
CATALOG MAILED ON REQUEST
CHAMPION SPARK PLUG COMPANY
TOLEDO, OHIO



All Acknowledge the Necessity of

Weed Chains

In one of those friendly after-luncheon, get-together parties at a well known city club, eleven men drifted on to *the subject of the dangers of skidding.* With a single exception each of the eleven owned an automobile, and each had a *skidding experience* to relate, and each felt that *his particular predicament* was the most sensational and startling.

While nearly all had experimented with the various so-called anti-skid tires, and acknowledged their possible advantages when new—yet when it came right down to "Brass Tacks," there wasn't a single one in the crowd but admitted that for *sure results,* for the **absolute elimination** of every possibility of skidding, **nothing even approximated Weed Chains,** and nothing took their place. Every one of the ten owners carried at least one pair of Weed Chains in his car.

Go where you will, put the question to any assembly of automobile owners you like and the verdict will always be the same—"*We can't get along without them.*"

Weed Chains are universally acknowledged to be the only anti-skid device that can be absolutely relied upon at all times and under all road conditions.

Weed Anti-Skid Chains

Insure perfect control and safe, comfortable driving

Don't foolishly pride yourself on taking chances in order to prove your bravery, or to demonstrate your ability as a driver.

Weed Chains are an absolute necessity on both rear tires and to doubly guard yourself against accidents and to make steering comfortable and easy, put them *on the front wheels too.* They cannot injure tires because "they creep"—occupy very little space when not in use—applied in a moment without the use of a jack or other tool.

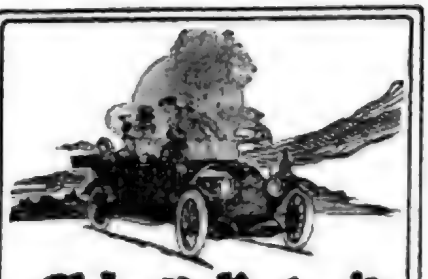
Take precaution now When you know the folly, the danger, the peril there is in driving your car over icy, slippery, snow covered roads and pavements, why not fully equip your car today with **Weed Chains** for your own protection and for the safety of other road users.

Recommended and sold by all reputable dealers

WEED CHAIN TIRE GRIP CO.
28 Moore Street New York
Manufactured in Canada by
THE DOMINION CHAIN COMPANY, Ltd.
Head Office: 4 Park Avenue, Montreal, Canada



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Abbott-Detroit

"The demand of the day is that an organization shall be judged by its product and not by what it claims for itself" Keep this in mind when you examine these 1913 models

MODELS AND PRICES

30-40	Four-door Roadster, 116-inch wheel base	$1700
34-40	5-passenger, Four-Door Touring Car 125-inch wheel base	$1700
44-50	5-passenger, Four-Door Demi-Tonneau 125-inch wheel base	$1975
44-50	7-passenger, Four-Door Touring Car 125 inch wheel base	$2000
44-50	Battleship Roadster, 125-inch wheel base	$2150
60-50	7-passenger, Four-Door Limousine 132-inch wheel base	$3050

Advance Catalog on Request

ABBOTT MOTOR CO.

WATERLOO STREET DETROIT, MICH.

"Built for Permanence" "Guaranteed for Life"



Save 50 to 75% OF YOUR WATER EXPENSE



The nozzle with automatic shut-off, fits end of hose, prevents waste, saves time, money and fuel. When warm water is used only exact amount necessary is heated, as no water is wasted and over one-half of the fuel bill is saved besides insuring full supply at all times. If water is supplied on measured service this nozzle will positively save you from 50 to 75% of your water bills.

FITS ANY 3-4 INCH HOSE | LASTS FOR YEARS

Money Back If Not Satisfied

PRICE $4.00

WRITE FOR CIRCULAR

THE B-L SALES COMPANY, Not Inc.

401 Monadnock Block, Chicago, Ill.

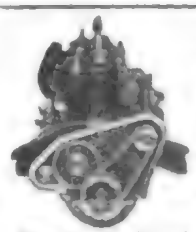
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Sheet Metal Stampings

Estimates Cheerfully Furnished

The Bossert Company

UTICA, N. Y.



CONTINENTAL

Six Cylinder—Unit Power Plant
Three Point Suspension

The Continental "Six" is maintaining, on the road at this minute, the good name made by our four cylinder types.

Built to accommodate any type of self-starter now made. Suitable for right or left hand drive.

Showing simple and efficient chain drive for starting motor.

4 and 6 cylinders
20 to 70 H. P.

Write for booklets.

CONTINENTAL MOTOR MFG. CO., Detroit, Mich.

Factory Representative, K. P. PETERSON
122 S. Michigan Blvd. Chicago

Perfection Spring Company

SPECIALISTS IN

Spring Suspension

High Grade Only

Cleveland, Ohio

AS A WARM HAND WHEEL DEALER

You will reap generous profits from easily made sales all over your territory. Every car owner who drives in winter will want this device as soon as he sees it. Write for Details.

THE WARM HAND STEERING WHEEL CO.
527 Fifth Ave., New York

Schafer Ball Bearings

Famous for Their Durability

BARTHEL & DALY

42 Broadway NEW YORK

NON-CARBON STARTER

The Starter Which Really Starts

The successful Starter for Fords as well as other makes. Combined Starter and Lighter, $35. Live Dealers given exclusive territory.

IMPERIAL SALES CO., Tiffin, Ohio

Reo the Fifth

Final and crowning achievement of R. E. Olds, pioneer designer of Autos. A standard size 30 to 35 horsepower four-cylinder car of modern refinements, priced at only $1,095.

R. M. OWEN & CO., General Sales Agents
REO MOTOR CAR CO., Lansing, Mich.

THE SELDEN TRUCK—$2000

Sold on Time Payment Plan

Best Agent's Proposition Ever Offered

Selden Truck Sales Co., 178 East Ave. Rochester, N. Y.

QUICK SALES—BIG PROFITS FOR DEALERS

Here is an accessory that will not stay on the shelf. It sells on sight.

MARVEL STEAM VULCANIZER

Automatic, therefore safe for rubber. Uses alcohol or gasoline. Low priced. Send for sales plan and sample Vulcanizer.

THE MARVEL AUTOMOBILE SUPPLY CO., 716 Bolivar Rd., Cleveland, O.

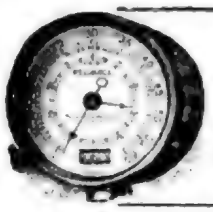
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"American Made"

NOW READY FOR THE TRADE

Highest Efficiency—Good Service Guaranteed

THE SIMMS MAGNETO CO. 799 Broadway, N. Y. City Factory, Bloomfield, N. J.



RELIANCE

"The Speedometer of Quality"

Special features that eliminate speedometer troubles. Send for the booklet.

Reliance Speedometer Co.
134 Eliot St. Boston, Mass.

POLSON

Quality Windshields

Auxiliary Seats, Bumpers and Gas Starters

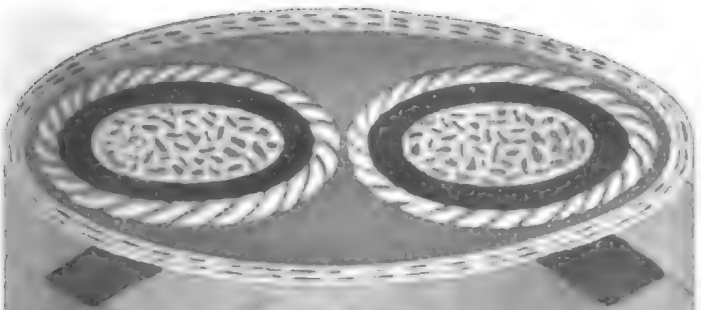
POLSON MANUFACTURING CO., Buffalo, N. Y.

Mosler Spit Fire Plugs ARE THE BEST

A. R. MOSLER & CO.
P. O. BOX "M"
MT. VERNON, N. Y.



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They Know the Best Cable Made

Dynamo, magneto and spark plug manufacturers know that efficiency in lighting, starting or ignition depends upon good wiring. To protect themselves against failures, they specify and use

Packard CABLE

If you are not using or selling *PACKARD CABLE* write today for new circular describing 27 different kinds of cable to suit every automobile need.

The Packard Electric Co.

Dept. D Warren, Ohio



DEALERS: A million motorists will have tire trouble in 1913. There is a demand for a **reliable,** inexpensive vulcanizer that can be used by anyone, anywhere—a vulcanizer that will mend tube punctures as perfectly as the most elaborate plant.

VUL CANIZER REPAIR KIT $2

The only inexpensive vulcanizer that actually **vulcanizes** a repair clear through because it is the only one in which the vulcanizing temperature is maintained long enough to cure the raw rubber. Its ever-present fuel, gasoline, is converted into a gas by the patent generator which distributes the flame over the vulcanizing surface at just the right intensity.

Other exclusive Shaler features are a handle that is cool enough to permit moving the vulcanizer the moment the repair is finished, asbestos plate inlaid in tube shelf to retain heat and prevent pinching tube, and universal clamp insuring even pressure to all parts of a repair.

A Real SHALER Vulcanizer

Not an experiment, but the product of the largest exclusive vulcanizer manufacturers in the world. Sold under the Shaler guarantee which has made the Shaler line of vulcanizers for motorists and repairmen the standard throughout the auto industry.

Get our trade proposition

Write today and get full details and trade prices on this indispensable accessory. Sooner or later every motorist will get a VUL-KIT from someone.

C. A. Shaler Co.

412 10th St. Waupun, Wis.

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For Sale—Wants—Exchange

15 cents per line of six words, cash with order. — In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

WANTED—Salesman calling on automobile supply houses to carry our TOW ROPES as side line. Twenty per cent commissions. BARKER MFG. CO., Rochester, N. Y.

FORE-DOORS.

BRING YOUR OPEN-FRONT CAR UP-TO-DATE.

WE MAKE FORE-DOORS TO FIT ALL STANDARD MAKES OF AUTOMOBILES.

WE CARRY LARGE STOCK AND GUARANTEE PROMPT SHIPMENTS.

WRITE FOR PRICES AND DESCRIPTION.

PIONEER FORE-DOOR MFG. CO.,
211-217 W. GEORGIA ST.,
INDIANAPOLIS, IND.

PEERLESS BACK AND CUSHION DRESSING.

For leather seats and cushions. Dries hard on clean leather. The color does not come off. Renews the finish. Ask your dealer.

THE COLUMBUS VARNISH CO.,
Columbus, Ohio.

SCHEBLER Model "L" Carburetors, new, 1¼ or 1½-inch, $8.00 each. Order early. KENT MOTOR CAR CO., Kenosha, Wis.

AGENCIES WANTED.

Agency wanted to cover parts of North and South Carolina. Exceptional facilities for advertising the best in any line. BOX 3, "Country Club," Flat Rock, N. C.

FORD OWNERS—You can increase the life of your tires 25% by fitting your car with Wire Wheels. Will also improve riding qualities of your car and make it up-to-date. Write, RACINE AUTO PARTS CO., Box 86, Racine Jct., Wis.

PEERLESS EXTRA FINE BLACK BAKING JAPAN.

For baking on all metals, no primer, one coat covering solid. Bakes to a high gloss finish in 2 to 3 hours. Can also bake to a semi-gloss and dull finish. Ask your dealer.

THE COLUMBUS VARNISH CO.,
Columbus, Ohio.

PURCHASING AGENT WANTED—By an eastern automobile manufacturing company. Must be high grade, good references. Applications lacking full detail will not be considered. Address Box 249, care of Motor World.

GARAGE FOR SALE—Building 28 x 50, corner lot 50 x 140; good location, half block from hotel, one block from depot. Must sell on account of health. Price, $1,000. JOHN OELUND, Moccasin, Mont.

PEERLESS EXTRA FINE BLACK JAPAN.

For all metal, lamps, radiators, fenders, etc. Air dries in 10 to 12 hours with a high gloss finish. Elastic, tough, durable. No primer; one coat covers solid. Ask your dealer.

THE COLUMBUS VARNISH CO.,
Columbus, Ohio.

GARAGE FOR SALE.

Only garage in county of over 30,000 inhabitants. Cars used the year round. Conveniently located in two-story stone building, with car elevator and modern equipment. Reason for selling: I have contracted to sell 30 Fords, 10 Overlands, 10 Buicks and 3 Cadillacs in this territory, and want to devote all of my time to selling. Working six mechanics all the time. $5,000 will buy the business.

O. O. FISHER, Marianna, Fla.

FOR SALE—Two Williams' Vulcanizing Kettles, in first-class condition. C. L. POST, 80 Gay St., Stamford, Conn.

YOUNG MAN of 25 wants to connect with some automobile factory in sales or publicity department. Five years' experience as salesman, dealer, etc. Address A. J. F., care Motor World.

"OHIO" WELDING AND SOLDERING STICKS.

We are manufacturers of high grade Aluminum Welding, Phosphor Bronze Welding and Iluminum Solder Sticks. Sold in quanaities of one pound and over. Write for price list. OHIO PATTERN WORKS, 2730 Spring Grove Ave., Cincinnati, Ohio.

ONE 16 and one 20-pass. Auto Buses, have been run only a short time. At a bargain. BECK & SON, Cedar Rapids, Iowa.

KEROSENE FOR AUTOMOBILES.

New Model B uses successfully half and half mixture lowest grades kerosene and gasolene. Satisfaction guaranteed or money refunded. Greatly increased power, very slow speed on high. Starts easy at zero. Special agents' prices. Dept. MW. The Air-Friction Carburetor Co., Dayton, Ohio.

FOR SALE—Overland car; will sacrifice if taken at once; am going to Europe and have no further use for same. Inquire HAUST'S CONFECTIONERY, 643 Grand St., Brooklyn, N. Y.

MAILING LISTS AND STATISTICS

Owners or dealers; any state, county or city; weekly and monthly supplements at lowest prices. Special lists of Electrics, Trucks, Fords, Studebakers, Overlands, etc.

MOTOR LIST CO. OF AMERICA
230 News Arcade Des Moines, Iowa

WILL exchange well secured first mortgage on Florida property bearing 7 per cent interest for automobile. Write for particulars, 21 Broad St., Milford, Conn.



An ad. like this will cost you 90c. for each insertion.

These columns offer you an opportunity to appeal to an audience of 8,000 readers whose merchandising taste is being cultivated

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For Sale—Wants—Exchange

15 cents per line of six words, cash with order. — In capitals, 25 cents per line —

A market place where Dealers, Jobbers and Manufacturers may buy, sell or trade used cars, parts and appliances and where help or situations may be secured at a nominal cost.

AUTOMOBILE salesman wanted on first class car, large commissions given. Apply to C. & C. AUTO CO., 1293 Bedford Ave., Brooklyn, N. Y.

CADILLAC 1911,
$675—5-passenger; top, windshield, slip covers, Prest-O, speedometer, extra shoes and tubes; entirely new; any demonstration. DUKE, 57 East 108th St., New York.

MANUFACTURING.
We have complete facilities for making your automobile accessories, electrical or mechanical devices, drop forgings, stamping or machined parts. Correspondence solicited.
CENTURY TELEPHONE CONSTRUCTION CO.,
1738 Elmwood Ave., Buffalo, N. Y.

$1500 will purchase five-ton Couple Gear Electric Truck, recently overhauled and in fine shape. All tires in perfect condition recently applied. KNOWLTON WAREHOUSE CO., Buffalo, N. Y.

RURAL Parcels Post Delivery Car—Any party with capital and push interested in placing one on the market, correspond with E. P. COWLS, Sparta, Mich.

FOR SALE—Stoddard-Dayton taxicab body in good condition. A bargain at $125.00. C. A. BURDETT, Hornell, N. Y.

FOR SALE—45 H.P. foreign Fiat, double chain drive, semi-speedster, two passenger, run about 1,000 miles. New tires and in excellent mechanical condition. Price $2,500.00, or will exchange. C. L. WHITING, 591 East Main St., Rochester, N. Y.

PLANT FOR SALE CHEAP—Suitable for auto bodies (especially limousine) and accessories. Power, lights, water, dry kilns, sprinklers, sidetracks, abundant storage. A. J. PHILLIPS CO., Fenton, Mich.

AUTOMOBILE CYLINDERS reground, new pistons and rings fitted. Garage air compressors. CAST IRON BRAZING CO., Manchester, N. H.

FOR SALE—Brush car, in good running order, complete, with top, extra tire and full equipment of tools; at a bargain. Address P. JONAS, 780 Delaware Ave., Milwaukee, Wis.

$400 BUYS, COST $1,000
Atterbury truck, 1912, half ton, panel top, hard tires, chain drive; sold because owner bought larger capacity. DUKE, 57 East 108th St., New York.

TO EXCHANGE—Mitchell Model G and lot in thriving town of Ashdown, Ark., for Buick roadster, 1911 or 1912 model, or other make as good. Address LOCK BOX 583, Pittsfield, Ill.

MACHINE Shops and Garages—Our WELD-IT-ALL machines will weld perfectly any broken casting that has a melting point. Full particulars on Oxy-Acetylene welding machines sent on receipt of your address. Every machine fully guaranteed. H. D. Prose & Co., Wichita, Kansas

APPLY Boyer's Automatic Refinisher to your automobile today. Tomorrow it will look as though it just came from the factory. Finest thing in the world for dull hoods. Easily applied with cheesecloth. Particulars free. Boyer Chemical Laboratory Co., State and Michigan Streets, Chicago, Ill.

ARE YOU in need of any additional help in any department of your business? Are you out of employment or looking for a better connection? Have you second-hand apparatus of any kind or do you want to buy second-hand material. Have you a factory site for sale or do you want to buy one? If so, use the Want and For Sale column of the Motor World. Seven words to the line, fifteen cents a line. Advertisements can be inserted over a number when it is desired and identity of the advertiser will be kept confidential.

BROKEN Cylinders and Crankcases—Send them to be made good as new at fraction of replacement cost. Scored cylinder repaired, $12. No new piston and rings required because bore is not enlarged. Where cylinders are worn (not scored from loose wrist pin) reboring is only remedy. We do it expertly. Write for complete information and estimates. WATERBURY WELDING COMPANY, Waterbury, Conn.

WANTED—A first-class man to take the agency for the latest invention on the market, a rubber cover for automobile handles called Steerease; write for full particulars. Address DEPARTMENT E, GOODYEAR RUBBER HOSE AND PACKING CO., 221 Chestnut St., Philadelphia, Pa.

AUTO LISTS, owners, etc., of any State. S. H. CARROLL, JR., Albany, N. Y.

CYLINDERS reground. Pistons fitted. Prompt shipments. HAUBER AUTOMOBILE WORKS, St. Marys, Pa.

FORD OWNERS—Our spare demountable wheel cures tire trouble on the road. Attention, Doctors. Write, ANGIER'S, Streator, Ill.

WHY PAY from $5.00 to $15.00 to have the Water Jacket or Radiator of Auto repaired when for $1.00 you can get a large tube of "FIRELESS SOLDER" that will positively do the trick without removing the engine or radiator from the frame. Send $1.00, money order or bill, and a regular $1.50 tube with testimonials will be promptly sent, charges prepaid. WAUSEO CHEMICAL COMPANY, Wauseon, Ohio.

WELDING—Cylinder crank case and crank shaft welded, cylinders rebored, $7.00 to $11.00 a cylinder, including piston and rings. STERLING ENG. CO., 331-333 S. Clinton St., Chicago, Ill.

BROKEN CRANKSHAFTS, cylinders, crankcases, flywheels, gear teeth, pistons, perfectly welded and machined ready to replace. Guaranteed and references. Machinery up to 5 tons welded. ATLAS WELDING WORKS, 74-76-78 Irving St., Rahway, N. J.

FOR SALE—Garage, equipment and business at Hobart, Okla., county seat of 5,000, two railroads, prosperous and growing agricultural section surrounding. Weather and roads such that everybody uses the auto the year round. No tie up for snow and ice. Come or write. D. A. SCOTT, Hobart, Okla.

weekly to the highest degree by our articles on "Wide Awake Merchandising." Look at the cost as shown in the margins.

An ad. like this will cost you 75c. for each insertion.

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25,000 Diamond Dealers

are going to cash in this season on

Diamond {No Clinch} Tires

made of more-mileage

Vitalized Rubber

a flint-like, road-resisting rubber that contains all the young, lusty vigor of the pure gum with no loss of elasticity

Perfect 3-Point Rim Contact

that holds with a vise-like rim grip, absolutely preventing the tire from breaking above the rim, insuring perfect rim fit and eliminating all rim troubles. Also the

No-Pinch Safety Flap

for inner tube protection—and, if you wish, the now famous

Safety (Squeegee) Tread

Be a Diamond Dealer *If you are not a Diamond Dealer, now is the time to get in line. There is a Diamond Branch near you—get in touch today.*

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"My Experience

in dealing with automobile accident cases has led me to the belief that the bulb-horn is an appliance the use of which should be eliminated by statute or ordinance. I cannot understand why its use is permitted, as from every point of view it is worthless.

"As a means of warning it is valueless. There is nothing about its sound which attracts attention from the public. Accidents occur more frequently with automobiles equipped with bulb-horns than with horns of later invention. It is as antiquated as the oil lamp."

Frank S. Morse

Claim Agent, Metropolitan Claim Department, The Ocean and Guarantee Co., Ltd., 59 John Street, New York

—And as a result the Ocean Accident & Guarantee Company attaches this rider to each of its automobile accident policies.

The ATTENTION

of the assured is called to the value of an efficient warning device in the prevention of accident.

The horn operated by means of a rubber bulb is frequently inaudible and cannot be relied upon in an emergency. It is a matter of record and experience that the bulb horn is inadequate to the demands of safe motoring.

An adequate danger signal should produce a harsh, abrupt note sufficiently loud to be heard under all conditions of traffic.

Ocean Accident & Guarantee Co., Ltd.

48 DIFFERENT MAKES OF CARS ARE NOW KLAXONIZED



KLAXONET

Lovell-McConnell Mfg Company Newark, N.J., U.S.A.

KLAXON

"The Public Safety Signal"



KLAXON

Studebaker

The Man Who Carefully Looks Over a Studebaker Always Comes Back

He may say "I'll look elsewhere" but like the needle to the pole, he returns.

—And why shouldn't he?

There is no bigger value than the Studebaker "25" at $885.00 for the man who wants a light yet powerful and efficient car.

If he wants a bigger car there is the Studebaker "35"—which holds six passengers in comfort, started by electricity, lighted by electricity, complete in appointments and modern luxuries for $1290.00. The first big car to be sold for less than $2000.00.

And if he is looking for a six cylinder car, the last word in uninterrupted power, quiet elegance and sumptuous good taste, introduce him to the Studebaker "Six."

In fact, the Studebaker line of auto cars is designed to meet the requirement of every prospective car owner.

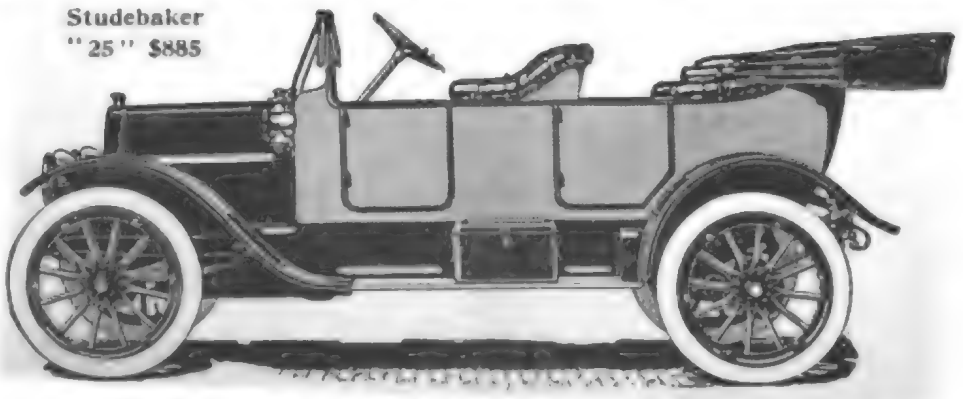
And every car turned out by Studebaker, whether it be a "25," a "35" or a "SIX" is an exponent of Studebaker integrity and reliability.

STUDEBAKER CARS

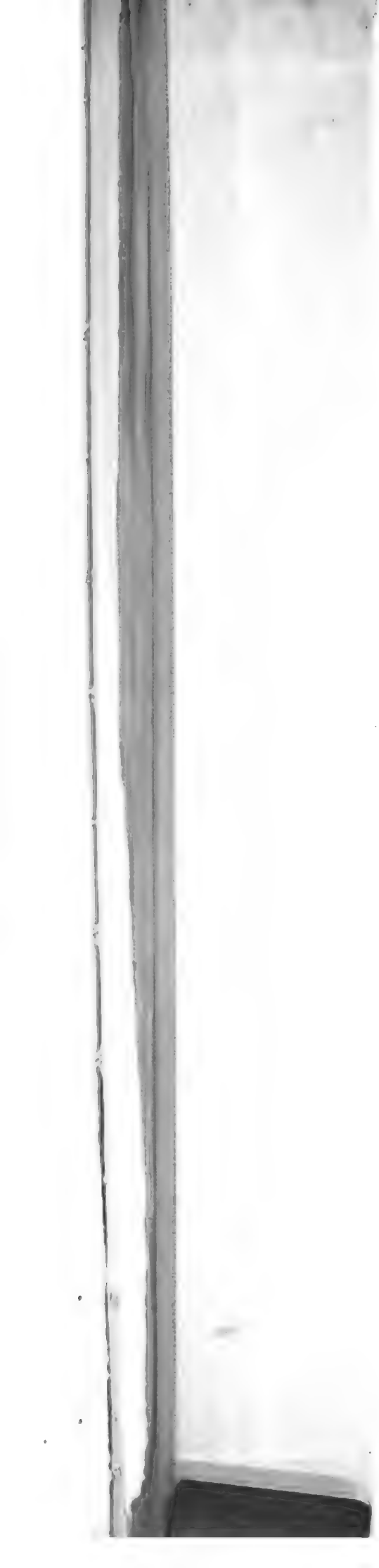
"20" Delivery Car.....$825	"35" Touring Car.....$1290	"SIX" Touring Car....$1550
"25" Roadster 885	"35" Sedan Type..... 2050	"SIX" Limousine 2500
"25" Touring Car..... 885	"35" Coupe 1850	

All prices for Cars fully equipped F. O. B. Detroit

The Studebaker Corporation, Detroit, Mich.



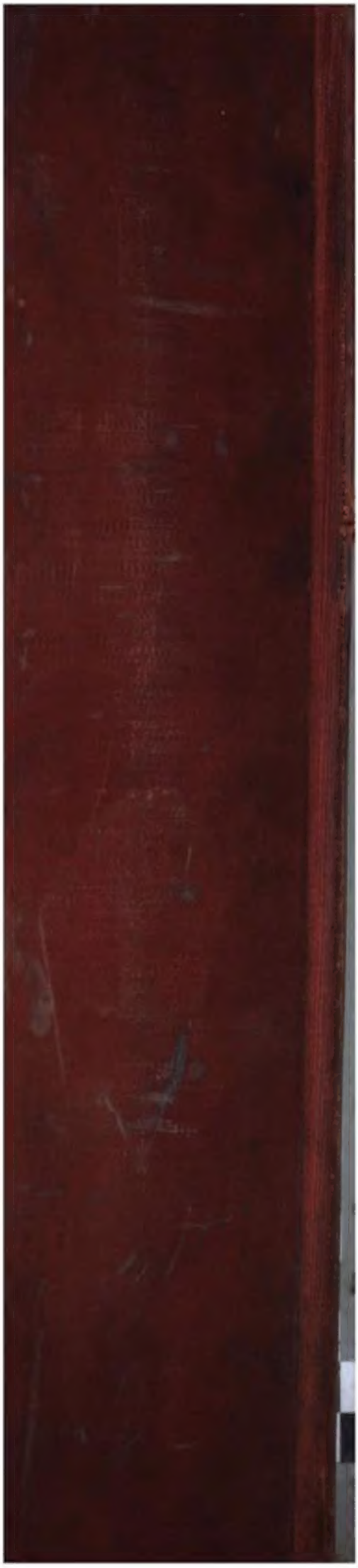
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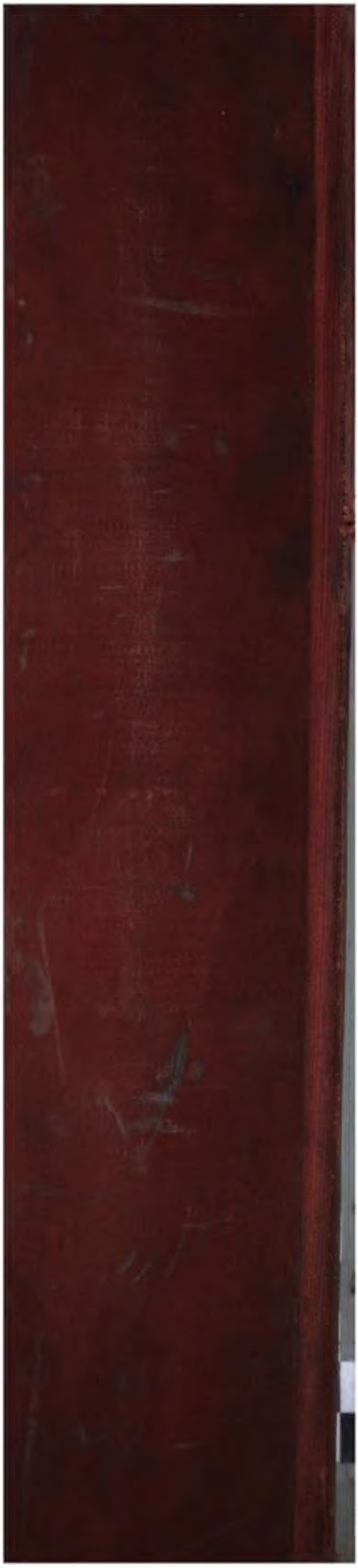
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